



AGENDA
CHASKA CITY COUNCIL
CHASKA EVENT CENTER - 3210 CHASKA BLVD & ZOOM
Monday, October 18, 2021
7:00 PM

1. Call to Order
2. Pledge of Allegiance
3. Roll Call
4. Adopt Agenda
5. Visitor Presentation
6. Proclamation
 - 6.A. Chaska Fire Department 150th Anniversary Recognition
7. Approve Previous Meeting Minutes
 - 7.A. Approve the October 4, 2021 City Council Meeting Minutes
8. Consent Items
 - 8.A. Adopt Resolution 2021-66, Approving the Lot Split for 3235 Chaska Blvd & 503 Chestnut St (Adyme Addition)/Mike Seifert/PC #2021-17
 - 8.B. 6th Street Bridge Easements for 2021 Downtown Project
 - 8.C. Adopt Resolution 2021-68, Accepting Gifts and Donations
9. Action Items
 - 9.A. Adopt Resolution 2021-69, Public Assessment Hearing: Adopt Resolution Approving the Imposition of Service Charges for the 2022 Chaska Downtown Special Services District

- 9.B. Adopt Resolution 2021-67 and Ordinance 1001, Approving the Preliminary Plat, Sale of Excess City Land, and Rezoning for Reserve at Autumn Woods/Lennar/PC #2021-16
- 10. Bills
 - 10.A. ACCOUNTS PAYABLE COUNCIL ROSTER 10-18-2021
- 11. Other Business
 - 11.A. City Administrator's Report
 - 11.A.i. Biweekly Report 10-18-21
 - 11.B. Other Reports
 - 11.B.i. Financial Reports - August 2021
 - 11.C. Downtown 41 Project Update
- 12. Adjourn



**CITY OF
CHASKA MINNESOTA**
“The Best Small Town in Minnesota”



PROCLAMATION

In Recognition of the Chaska Fire Department and its 150th year Anniversary

WHEREAS: the Chaska Fire Department was founded in 1871, making it the oldest department in the City of Chaska; and

WHEREAS: throughout its long history has had five fire stations and apparatus ranging from horse-drawn pumpers to the first motorized engine in 1926 to the engines and tower trucks of today; and

WHEREAS: 25 fire chiefs and hundreds of firefighters in the Chaska Fire Department’s past and present have knowingly accepted risking their lives to protect and preserve the lives and property of others and have performed their duties with pride, honor, respect, and integrity; and

WHEREAS: for 150 years and counting, the Chaska Fire Department has provided the community with reliable fire protection service, emergency medical service, and a reduction of threats to the community through education and information sharing; and

WHEREAS: our community is truly fortunate to be served by dedicated individuals who give their time in service to those in need and engage in hundreds of hours of specialized training to further their firefighting skills and life-saving knowledge.

NOW, THEREFORE BE IT RESOLVED: That I, Mark Windschitl as the Mayor of Chaska, and on behalf of the Chaska City Council and the City of Chaska do hereby proclaim congratulations and gratitude to the members of the Chaska Fire Department for their service to Chaska these 150 years.

IN WITNESS WHEREOF, I have set my hand on the Seal of the City of Chaska this 16th day of October, in the year of our Lord two thousand and twenty-one.

Mark Windschitl
Mayor, City of Chaska

DRAFT

**- MINUTES -
CHASKA CITY COUNCIL
OCTOBER 4, 2021**

1. Call to Order

The meeting was called to order by Mayor Windschitl at 7:00 pm.

2. Pledge of Allegiance

3. Roll Call

Roll call was taken. Present: Councilmembers Hatfield, Hubbard, Huang, and Mayor Windschitl

Absent: Councilmember Grau.

Also Present: Matt Podhradsky, City Administrator; Noel Graczyk, Administrative Services Director; Kevin Wright, Communication Director; Nate Kabat, Assistant Administrator; Kevin Ringwald, Community Development Director; Liz Hanson, City Planner; Jake Sofly, City Attorney; and City Engineer Matt Clark.

4. Adopt the Agenda

Motion by Councilmember Hatfield, second by Councilmember Hubbard to adopt the agenda as presented. Motion carried.

5. Visitor Presentation

5.A. Visitor Presentation Greg Boe – Overview of 2021 Legislative Session

Rep. Boe provided an overview of the 2021 Legislative Session. He stated with everything that has happened over the past year, now more than ever it is important to support local businesses. He stated unfortunately, there were some laws that were voted down regarding first responder and law enforcement support that as a result has limited the joint efforts when needed with some neighboring states, he noted they will try again next year to fix some of those issues to further support our first responders and law enforcement. He stated he appreciates the time to discuss these important issues with the Council and if anyone ever has comments or questions, they can reach his office at 651-296-5066 or rep.greg.boe@house.mn.

6. Proclamations

6.A. Proclamation In Recognition of National Pregnancy and Infant Loss

Mayor Windschitl read a proclamation recognizing National Pregnancy and Infant Loss declaring October 15th, 2021 be recognized as Pregnancy and Infant Loss Remembrance Day.

6.B. Proclamation In Recognition of Domestic Violence Awareness Month

Mayor Windschitl read a proclamation recognizing Domestic Violence Awareness, declaring October 2021 as Domestic Violence Awareness Month.

7. Minutes

7.A. Approve September 20th, 2021 City Council Meeting Minutes

Motion by Councilmember Hubbard, second by Councilmember Huang to approve the minutes of the September 20th, 2021 City Council meeting. Motion carried.

8. Consent Agenda

Motion by Councilmember Hatfield, second by Councilmember Huang to approve the Consent Agenda Items A through F:

- A. Accept Resignation of Lisa White from the Human Rights Commission
Motion to accept the resignation of Lisa White from the Chaska Human Rights Commission and open the seat to applications.
- B. Adopt Resolution 2021-63, Resolution in Support of City's Capital Project Grant Request Under Minn. Stat. § 16A.86 for the City Square West Project
Motion to adopt Resolution 2021-63, in support of City's capital project grant request under Minn. Stat. § 16A.86 for the City Square West Project
- C. Adopt Resolution 2021-64, Approving Resolution for Cogeneration and Small Production Tariff - Updated for Unbundling of Rates
Motion to approve Resolution 2021-64 updating adjustment rates for Cogeneration and Small Production Tariff – Updated for Unbundling of Rates.
- D. EV Charge Program License Agreement with Minnesota Municipal Power Agency
Motion to approve EV Charge Program License Agreement with Minnesota Municipal Power Agency
- E. Adopt Resolution 2021-65, A resolution committing required local matching funds and authorizing submission of an application for grant funding from the U.S. Department of Commerce's Economic Development Administration (EDA)
Motion approving Resolution No. 2021-65 committing required local matching funds and authorizing submission of an application for grant funding from the U.S. Department of Commerce's Economic Development Administration (EDA).
- F. Approving Purchase Agreement for Right of Way of City Collector Road named Savanna Way
Motion to authorize City Administrator and Mayor to fully execute the Purchase Agreement related to the land acquisition of right of way for Savanna Way.
Motion carried.

9. Bills

9.A. Accounts Payable Council Roster 10-4-2021

Council requested further information on pages 11 and 20.

City Administrator Podhradsky provided further information regarding those bills.

DRAFT

Motion by Councilmember Huang, second by Councilmember Hubbard to approve the bills as presented. Roll call was taken. Voting aye: Councilmembers Hatfield, Hubbard, Huang, and Mayor Windschitl. Voting nay: None
Motion carried.

10. Other Business

10.A. City Administrator's Report

10.A.i. Bi-Weekly Report October 4, 2021

10.B. Other Meeting Minutes

10.B.i. HRC Minutes – August 26, 2021

Councilmember Huang:

- Noted on the Fire and Ice Festival is on October 15th-16th at Fireman's Park
- Noted October 22nd at Carver County Parks is Trail of Fun and fall activities
- Noted October 30th Fall Clean-up Day
- Congratulated SouthWest Transit for being awarded Crime Prevention Award

Councilmember Hubbard:

- Chaska Herald had a nice article September 23rd Edition on the Steiner Kelting Mental Health Wellness Facility
- Noted the Bicycle Steering Committee meeting will have some engagement events to get public feedback
- Stated Crucial Conversations will be hosting a picnic engagement event on October 20th at 6:30pm

Councilmember Hatfield:

- Stated it was nice to have the Superintendent present for the Work Session and noted it is important to be role models for the public and kids who may be watching the meetings

City Administrator Podhradsky:

- Noted next Tuesday and Wednesday is the Council Retreat

Mayor Windschitl:

- Congratulated Kevin Ringwald on his retirement
- Stated the Walnut Street construction is underway
- Noted the next Council meetings are on October 18th (to be held at the event center) and November 1st and 15th

11. Adjourn

Motion by Councilmember Hubbard, second by Councilmember Hatfield to adjourn the meeting at 8:00 pm.
Motion carried.

REQUEST FOR ACTION CHASKA CITY COUNCIL 10/18/2021

Subject: Lot Split for 3235 Chaska Boulevard and 503 Chestnut Street (Adyme Addition)

Applicant: Mike Seifert

Location: 3235 Chaska Blvd and 503 Chestnut St

Case Number: P.C. No. 2021-17

Synopsis: The applicant is requesting approval of a Lot Split for 3235 Chaska Blvd and 503 Chestnut St

Prepared By: Elizabeth Hanson

Staff Recommendation: Motion to adopt Resolution approving the request

Request & Analysis

The applicant, Mike Seifert, is requesting a lot split on the Adyme Addition property at 3235 Chaska Boulevard and 503 Chestnut Street. These addresses are currently within one singular lot, but encompass two separate buildings.

The request to split the parcel will not create any adverse results as setbacks will still be met. The lot split approval will allow for the buildings to have flexibility to be leased or owned, versus just being leased. 3235 Chaska Boulevard is depicted as 'Parcel A', and 503 Chestnut Street is depicted as 'Parcel B' in the attached survey. The property owner will create cross access easements to ensure all properties of this development have ability to use the parking and sidewalks of the development.

The proposed lot is located in the Planned Multi-Use District (PMD-17) zoning district. Splitting the parcel will not render the parcels in violation of the Zoning Ordinance.

CITY COUNCIL ACTION REQUESTED

Motion to adopt Resolution 2021-66, approving the Lot Split on 3235 Chaska Boulevard and 503 Chestnut Street, subject to the stipulations included in said resolution and the following conditions:

1. Approvals shall be based on the following graphic exhibits:
 - a. Lot Split Survey, prepared by Advance Surveying & Engineering Co., dated September 23, 2021
2. Provision of adequate cross access easements are executed and recorded with the lot split at Carver County

**CITY OF CHASKA
CARVER COUNTY, MINNESOTA**

RESOLUTION

DATE OCTOBER 18, 2021 **RESOLUTION NO.** 2021-66

MOTION BY COUNCILMEMBER _____ **SECOND BY COUNCILMEMBER** _____

Resolution approving the Lot Split for 3235 Chaska Blvd and 503 Chestnut St/Mike Seifert/P.C. No. 2021-17

WHEREAS, the applicant, Mike Seifert, is requesting a lot split on the Adyme Addition property at 3235 Chaska Boulevard and 503 Chestnut Street; and

WHEREAS, these addresses are currently within one singular lot, but encompass two separate buildings; and

WHEREAS, the request to split the parcel will not create any adverse results as setbacks will still be met; and

WHEREAS, the lot split approval will allow for the buildings to have flexibility to be leased or owned, versus just being leased; and

WHEREAS, 3235 Chaska Boulevard is depicted as 'Parcel A', and 503 Chestnut Street is depicted as 'Parcel B' in the attached survey; and

WHEREAS, the property owner will create cross access easements to ensure all properties of this development have ability to use the parking and sidewalks of the development; and

WHEREAS, the proposed lot is located in the Planned Multi-Use District (PMD-17) zoning district. Splitting the parcel will not render the parcels in violation of the Zoning Ordinance; and

NOW, THEREFORE, BE IT RESOLVED, by the City Council of the City of Chaska, Minnesota, hereby approves the Lot Split for 3235 Chaska Blvd and 503 Chestnut St (PC#2021-17), subject to the aforementioned stipulations and the following conditions:

1. Approvals shall be based on the following graphic exhibits:
 - a. Lot Split Survey, prepared by Advance Surveying & Engineering Co., dated September 23, 2021
2. Provision of adequate cross access easements are executed and recorded with the lot split at Carver County

Passed and adopted by the City Council of the City of Chaska, Minnesota, this 18th day of October, 2021.

Attest: _____
Chaska Deputy Clerk

Mark Windschitl, Mayor

October 5, 2021

City of Chaska
Atten: Elizabeth Hanson

Re: Lot Split PID: 30.1720030

Dear Liz,

We are proposing a Lot Split regarding the Property / Plat known as the Adyme Addition, which includes the following PID's:

301720030 (to be split) Vacant bldg. and Domino's

301720040 Shop 501

30172050 Large parking lot

301720010 Small South parking lot

301720011 Small north parking lot

301720070 Outlot B

Recently, potential Tenants have expressed the desire to own rather than lease the available space and we would like the flexibility to offer that option. We would create cross easements to insure access to all parking and sidewalk areas and we would form an association to govern the entire development. All documents will be recorded with the county as necessary.

Please don't hesitate to contact me with any questions or comments.

Thank you,

Mike Seifert
Adyme LLC

LEGAL DESCRIPTION:
Lot 1, Block 1, Adyme Addition, Carver County, Minnesota.

Lot 1, Block 2, Adyme Addition, Carver County, Minnesota.

Lot 2, Block 2, Adyme Addition, Carver County, Minnesota.

Lot 3, Block 2, Adyme Addition, Carver County, Minnesota.

Outlot A, Adyme Addition, Carver County, Minnesota.

Outlot B, Adyme Addition, Carver County, Minnesota.

PROPOSED LEGAL DESCRIPTION PARCEL A:
That part of Lot 1, Block 2, Adyme Addition, Carver County, Minnesota, lying northwesterly of a line running from the northeasterly corner of Lot 3, Block 2, said Adyme Addition to the southwesterly corner of Outlot A, said Adyme Addition.

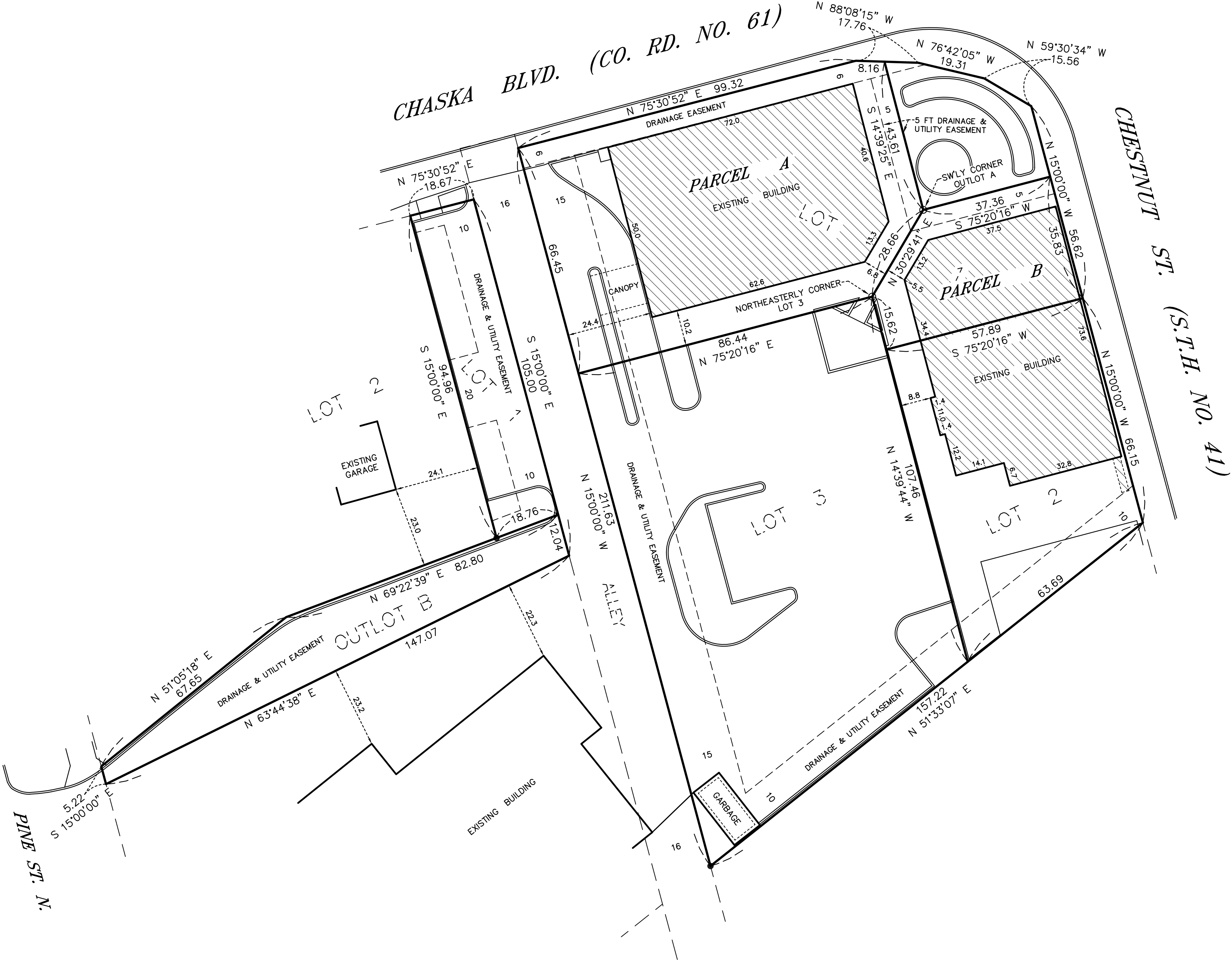
Contains: 6,875 Sq. Ft.

PROPOSED LEGAL DESCRIPTION PARCEL B:
That part of Lot 1, Block 2, Adyme Addition, Carver County, Minnesota, lying southeasterly of a line running from the northeasterly corner of Lot 3, Block 2, said Adyme Addition to the southwesterly corner of Outlot A, said Adyme Addition.

Contains: 1,865 Sq. Ft.

- SCOPE OF WORK & LIMITATIONS:**
- Showing the length and direction of boundary lines of the legal description listed above. The scope of our services does not include determining what you own, which is a legal matter. Please check the legal description with your records or consult with competent legal counsel, if necessary, to make sure that it is correct and that any matters of record, such as easements, that you wish to be included on the survey have been shown.
 - Showing the location of observed existing improvements we deem necessary for the survey.
 - Setting survey markers or verifying existing survey markers to establish the corners of the property.
 - Existing building dimensions and setbacks measured to outside of siding or stucco.
 - This survey has been completed without the benefit of a current title commitment. There may be existing easements or other encumbrances that would be revealed by a current title commitment. Therefore, this survey does not purport to show any easements or encumbrances other than the ones shown hereon.

STANDARD SYMBOLS & CONVENTIONS:
"●" Denotes iron survey marker, set, unless otherwise noted.



REQUEST FOR ACTION CHASKA CITY COUNCIL 10/18/2021

Subject: 6th Street Bridge Easements for 2021 Downtown Project

Prepared By: Matt Clark, City Engineer

This year's downtown project includes replacing the existing bridge located along Sixth Street in downtown. The existing narrow two-lane bridge is being replaced with a new concrete box culvert like what was installed most recently along Stoughton Avenue in downtown last year. The new box culvert will be larger in width and requires easements outside public right of way from three properties that abut the new bridge. The larger bridge will allow for a standard residential street to be constructed over the top with the future street project.

Because of the age of downtown, drainage and utility easements that are now standard with development were not required at the time. The easements shown on the attached exhibit that are needed are not only to construct the new box culvert, but also allow for City maintenance of the existing creek channel. Since early summer, City staff worked with consultants, completed appraisals, and have been meeting with property owners to secure the proper permanent and temporary easements which all have agreed to. The total compensation with all three easements all three properties impacted are listed below. The easements required to install the bridge are eligible for reimbursement through state aid funds. Staff has been and will be continuing to keep the property owners informed as construction occurs this fall.

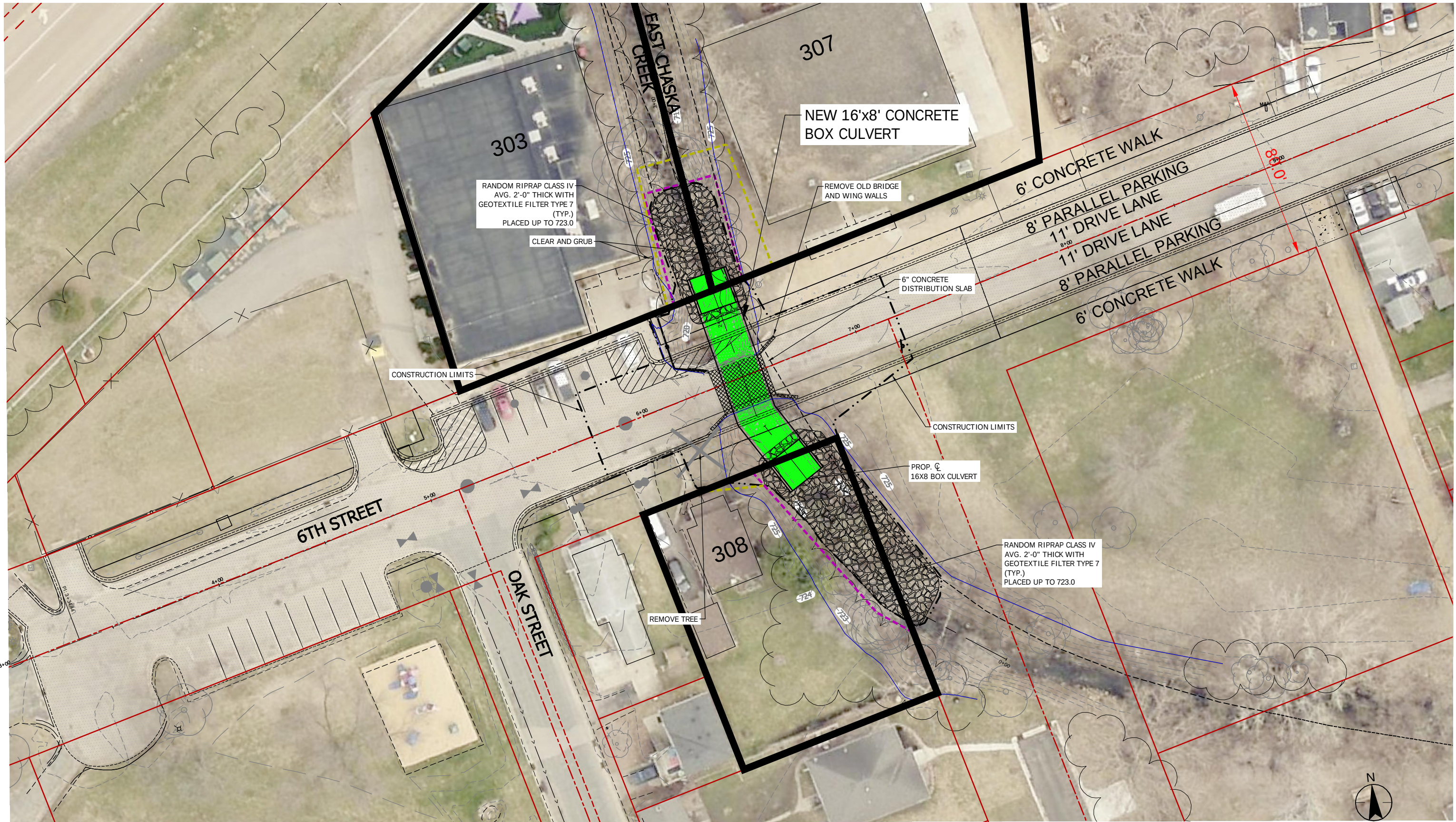
308 6th St. East
Steven S. & Ana L. Link
Total Easement - \$18,800

307 6th Street East
Garrett F. Jedlicki
Total Easement – \$8,500

303 6th Street East
SouthWest Metro Education Coop
Total Easement - \$7,175.00

CITY COUNCIL ACTION REQUESTED

Motion to Approve and Authorize Payment to Acquire Fee Title and Various Easement for Roadway, Sidewalk, Trail, Drainage and Utility Purposes Over Certain Property.



6TH STREET CULVERT EXHIBIT

CITY OF CHASKA, MN
 6TH STREET BRIDGE REPLACEMENT
 8.1.6 6th Street Bridge Easements for 2021...

FIGURE PROPERTY AND EASEMENTS



**REQUEST FOR ACTION
CHASKA CITY COUNCIL
10/18/2021**

Subject: Accepting Gifts and Donations

Reviewed By: Kelly Grinnell, Finance Manager

Prepared By: Erin Barnum, Accounting Supervisor

The City receives various donations or gifts throughout the year. Pursuant to M.S. 465.03 all such gifts must be acknowledged and accepted by a resolution approved by a two-thirds majority of the City Council. Staff have drafted the attached proposed resolution that lists all monetary and nonmonetary gifts received by the City during the third quarter of 2021. Staff recommends approval of the resolution to acknowledge acceptance of each gift as listed.

CITY COUNCIL ACTION REQUESTED

Motion to adopt Resolution 2021-68 acknowledging and accepting gifts to the City of Chaska received during the period July 1, 2021 through September 30, 2021.

CITY OF CHASKA
CARVER COUNTY, MINNESOTA

RESOLUTION

DATE 10/1/2021 RESOLUTION NO. 2021- 68

MOTION BY COUNCILMEMBER _____ SECOND BY COUNCILMEMBER _____

**A RESOLUTION ACKNOWLEDGING AND ACCEPTING GIFTS TO THE CITY OF CHASKA
RECEIVED DURING THE PERIOD OF July 01, 2021 THROUGH September 30, 2021
(PURSUANT TO M.S. 465.03)**

WHEREAS, the City of Chaska, City Council, pursuant to M.S. 465.03, may accept a grant or device of real or personal property and maintain such property for the benefit of its citizens in accordance with the terms prescribed by the donor; and

WHEREAS, nothing herein shall authorize such acceptance or use for religious or sectarian purposes; and

WHEREAS, every such acceptance shall be by resolution of the City of Chaska, City Council, adopted by a two-thirds majority of its members, expressing such terms in full.

NOW, THEREFORE, BE IT RESOLVED, that the City of Chaska City Council hereby acknowledges and accepts the following gifts to Chaska that have been received during the period of JULY 01, 2021 through SEPTEMBER 30, 2021:

- Miscellaneous Donations \$704 – Police Department
- Shamrani Sacchi \$100 – Fire Department
- Chaska Lions Club \$500 – Touch a Truck Event
- Chaska Lions Club \$2,262.36 – Senior Picnic
- Chaska Park Dental \$500 – Fire & Ice Festival
- ServePro Minnetonka \$500 – Fire & Ice Festival
- Little Roos \$500 – Fire & Ice Festival
- Old National Bank \$550 – Touch a Truck Event Band & Popcorn
- Chaska Heights Senior Living \$500 – AOA Birthday & Absolutely Elvis Special Event

Passed and adopted by the City Council of the City of Chaska, Minnesota, this 18th day of October 2021.

Mark Windschitl, Mayor

Attest: _____
Chaska Deputy Clerk

REQUEST FOR ACTION CHASKA CITY COUNCIL October 18, 2021

Subject: Public Assessment Hearing: Adopt Resolution Approving the Imposition of Service Charges for the 2022 Chaska Downtown Special Services District

Prepared By: Nate Kabat

Background

In 2014, the City Council approved the establishment of the Chaska Downtown Special Services District (SSD) with a professional services agreement with the Chaska Downtown Business Alliance (CDBA) to manage the district for five years. An SSD allows property owners in a commercial district to collectively assess themselves each year to create a pool of funds. All the funds are directed back to the district in the form of enhanced services and/or special amenities. These enhanced services and special amenities are over and above what the City ordinarily provides. Only commercial properties or the commercial portion of a property in the case of a mixed-use property, within the district are assessed service charges.

Each year the City Council must approve a budget and assessment of fees via Public Hearing per Minnesota Statute 428A. Commercial property owners are given the opportunity to file an objection. At its September 20, 2021 meeting, Council called for a public hearing to be held for this purpose on October 18, 2021.

Request

The Chaska Downtown SSD is requesting the City Council to approve its proposed operating plan/budget and approve an imposition of service charges resolution to pay for the services referred to in the budget.

Analysis

Operating Budget: The CDBA is the lead entity responsible for implementing the various services and activities and in turn has retained various professional event organizers, consultants, contractors, and a part-time staff person to assist with implementing the various services. They have met on several occasions within the past few months and have developed the draft operating budget for 2022 provided in Exhibit A attached to the resolution of this agenda item.

The consensus of the Chaska Downtown SSD is that the draft budget will address the most critical needs under their purview. Members of the Chaska Downtown SSD board will attend the meeting to review 2021 accomplishments and highlight 2022 goals.

Imposition of Service Charges: Based on the combined total estimated market value of all commercial properties within the District under consideration (see Exhibit B on the resolution) and an operating budget of \$58,100, a 0% change compared to 2021, the service charge rate would be \$1.02 per \$1,000 in estimated market value per year; a 1% decrease. For example, a commercial building with an estimated market value of \$500,700, which is the median value amount in downtown, would pay a service charge of approximately \$511 per year.

Notably, the SSD is not proposing an increase in operating budget compared to the previous year.

Table 1 provides the approved service charge and operating budget for the past budget cycles, and the request for the 2021 budget.

Budget Year	Service Charge	Operating Budget
2015	\$0.79 per \$1,000	\$44,000
2016	\$0.90 per \$1,000	\$46,525
2017	\$1.12 per \$1,000	\$60,100
2018	\$1.21 per \$1,000	\$60,100
2019	\$1.09 per \$1,000	\$60,100
2020	\$1.04 per \$1,000	\$58,100
2021	\$1.03 per \$1,000	\$58,100
2022	\$1.02 per \$1,000	\$58,100

Recommendation

The CDBA has demonstrated success in managing the SSD over the past budget years. Outcomes of the SSD include the Chaska Downtown website, hiring a part time administrator, involvement in The 19th Hole Community Celebration and the 18 Holes of Chaska for the Ryder Cup, facilitating communication for the 2nd Street improvements in 2017 and 5th street improvements in 2021, leading the 2nd Street Block Party, which has now grown into Oktoberfest in collaboration with Guardian Angels Fall Festival and Schram Brewery, leading the annual Hometown Holiday event the first weekend of December, creating the art tables and Adirondack chairs that visitors find throughout downtown, and offering ongoing marketing and business strategy trainings to businesses in the district. The 2022 operating plan will allow the CDBA to continue leveraging resources through the SSD to promote and revitalize downtown. Given the support the CDBA has received for its initiatives, staff recommends adoption of the attached resolution.

CITY COUNCIL ACTION REQUESTED

Motion to Adopt Resolution 2021-69 Imposing Service Charges and Setting the 2022 Operating Budget and Plan for the Chaska Downtown Special Service District.

**CITY OF CHASKA
CARVER COUNTY, MINNESOTA**

RESOLUTION

DATE 10/18/2021 **RESOLUTION NO.** 2021-69

MOTION BY COUNCILMEMBER _____ **SECOND BY COUNCILMEMBER** _____

A RESOLUTION APPROVING THE SPECIAL SERVICES AND SERVICE CHARGES FOR 2022 WITH THE CHASKA DOWNTOWN BUSINESS ALLIANCE TO SERVE AS DISTRICT MANAGEMENT ENTITY FOR THE CHASKA DOWNTOWN SPECIAL SERVICE DISTRICT

WHEREAS, a public hearing was held on October 18, 2021, in accordance with Minnesota Statutes, Chapter 428A, Sections 428A.01 through 428A.10 and City of Chaska Code of Ordinance 891, to consider the proposed special services, the proposed service charges and the proposed lists of service charges as on file in the office of the City Clerk and to consider all written and oral objections and statements regarding this matter;

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Chaska: That the Chaska Downtown Business Alliance, per the terms of the Professional Services Agreement, serve as the district management entity for the Chaska Downtown Special Service District hereby are approved; and

BE IT FURTHER RESOLVED that the proposed special services and the proposed cost estimate in the total amount of \$58,100 for 2022, be and hereby are approved for the Chaska Downtown Special Service District; and

BE IT FURTHER RESOLVED that the proposed service charges in Exhibit A, attached hereto and made a part hereof, and the proposed list of service charges (special assessments) for 2021 budget, Exhibit B, attached hereto and made a part hereof, in the total amount of \$58,100 as provided for in the City of Chaska Code of Ordinance No. 891 as prepared by the City Clerk and on file in the office of the City Clerk be and hereby are approved for the Chaska Downtown Special Service District; and

BE IT FURTHER RESOLVED that the service charges shall be collected with the 2022 real estate tax statements in the same manner as special assessments without interest charges and that the City Clerk is hereby directed to transmit certified copies of said lists of service charges to the Carver County Property Records and Taxpayer Services Division.

Passed and adopted by the City Council of the City of Chaska, Minnesota, this 18th day of October 2021.

Mark Windschitl, Mayor

Attest: _____
Chaska Deputy Clerk

CHASKA DOWNTOWN SPECIAL SERVICE DISTRICT

SEPTEMBER 2021

PROPOSED 2022 OPERATING PLAN AND BUDGET

INTRODUCTION

We are pleased to present downtown business and property owners with this overview of the proposed Chaska Downtown Special Service District services for 2022. Established in 2014 and launched in 2015, the Chaska Downtown Special Service District is a public-private partnership with the City of Chaska in which commercial property owners and businesses owners elect to make a collective contribution to the promotion, development and maintenance of their commercial district.



In a Special Service District, a small additional service charge is imposed on commercial properties each year on their property tax statements. These funds are pooled by the City and redirected to our local business association, the Chaska Downtown Business Alliance, to fund a variety of services and activities aimed directly at attracting more customers and fostering economic growth for area businesses. These services and activities are over and above what the city ordinarily provides.



MISSION

The mission of the Chaska Downtown Special Service District is to assist in creating and promoting a downtown business district which reflects and preserves our small-town atmosphere, unique character and values. The District's priorities include:

- > Marketing and promoting local businesses via online and offline marketing strategies along with creating content that allows the community to engage with the businesses.
- > Producing and promoting local events that attract customers to the downtown area;
- > Creating more opportunities for businesses and property owners to communicate with one another as well as stay abreast of what's happening in the downtown area; and
- > Creating and maintaining a thriving downtown business district by supporting various programs that impact both businesses and the overall community.

GOVERNANCE AND IMPLEMENTATION OF SERVICES

The Chaska Downtown Special Service District is guided by the Chaska Downtown Business Alliance (CDBA). The CDBA is a tax-exempt 501c(6) Minnesota nonprofit corporation and is led by an eight-member, all-volunteer, Board of Directors whose members include:

- > Krista Flemming, The Chaska Mill & Granary and Commercial Property Owner
- > Rick Ford, Community Insurance Advisors and Commercial Property Owner
- > Dan Keyport, Dolce Vita Wine and Commercial Property Owner
- > Steve Ritz, Fitness First
- > Lynn Laumann, Laumann Photography
- > Melissa Carlson, Charter Bank

The CDBA, with oversight from the City, will continue to be the lead entity responsible for implementing the various services and activities proposed as part of the Special Service District. The CDBA will in turn retain various professional event organizers, consultants, contractors, and a part-time staff person to assist with implementing the various proposed services.

DISTRICT MAP AND PROPOSED SERVICE CHARGE METHODOLOGY

The District map is unchanged from 2021.

The method for prorating service charges will remain unchanged from 2021. Because the types of services and activities being proposed will benefit all types of businesses and commercial property owners in the downtown area, using a commercial property's total estimated market value (as determined by the county assessor) as the basis to determine its prorated fair share of the costs is again being proposed.

The City has completed an analysis of every commercial property within the downtown area and has developed proposed service charge calculations for each property. Based on the combined total estimated market value of all commercial properties within the District and a total service charge amount of \$58,100, the service charge calculates to \$1.02 per \$1,000 in estimated market value for 2022. For example, a commercial building with an estimated market value of \$500,700 would pay a service charge of approximately \$511 per year. The service charge will be included as part of the "Special Assessments" line item on the normal property tax statements for each commercial property.



2022 BUDGET PRIORITIES

The CDBA Board of Directors is recommending the following services and activities focused on the core needs of downtown businesses for 2022. Should there be a surplus balance from the 2021 service charges, the CDBA will propose an amendment to this operating plan to incorporate those funds.

SOURCES (PROPOSED REVENUE)

1. SSD Service Charges (<i>service charges imposed on commercial properties</i>)	\$58,100
	\$58,100

USES (PROPOSED EXPENDITURES)

1. Marketing and Promotions of Businesses <i>Working to increase the reach of both our web and social platforms to continue to engage and educate the community on businesses, events and key information related to visiting downtown. Continue to add valuable content and functionality to the website and to drive branded and relevant content to both web and social platforms. Includes partnering with the City and SWMC to support and share relevant content.</i>	\$15,000
2. Promotional Events <i>Organizing and supporting local events that draw customers to downtown and drive traffic into businesses by expanding and enhancing several existing events and creating new events that foster social distancing if needed. Includes developing and providing continuing education for business growth.</i>	\$15,000
3. District Operations and Communications <i>Create opportunities for businesses and property owners to communicate with one another by producing and distributing periodic newsletters and e-updates along with hosting quarterly social/networking hours that include communicating critical growth information and city updates along with supporting a Neighborhood Business Watch program.</i>	\$2,550
4. Administration <i>Improving the capacity of the business community to respond to issues affecting all business and property owners as well as proactively pursue new opportunities by providing resources for routine administrative expenses; legal, accounting and other professional fees; insurance; etc. Including the support of the process to administer the SSD Service Charge.</i>	\$6,550
5. Business Recruitment and Retention <i>Partnering with the City of Chaska with dedicated spending aimed at new initiatives geared at business recruitment and retention coming from the strategic planning session. Support for the Sign Grant Project along with continued support for any special projects that help to move us forward and continue to evolve with the changing needs of the downtown businesses.</i>	\$19,000
	\$58,100

MORE INFORMATION

For more information, please contact:

Chaska Downtown Business Alliance
Dan Keyport
Dolce Vita Wine Shop
dan@dolcevitawine.net

DCSSD Administrator
Jen Angell
(612) 804-5531
jenannangell@gmail.com

EXHIBIT B
CHASKA DOWNTOWN SPECIAL SERVICE DISTRICT
IMPOSITION OF SERVICE CHARGES

Special Assessment Terms			
S/A Code:	302203/302203C/302203E	Improvement Fees:	\$ 58,100.00
Adoption Date:	10/18/2021	Additional Fees:	N/A
Term:	One (1) Year	Special Assessment Base	\$ 58,100.00
Year Payable	2022	Add 1.5% SA Administrative Fee:	N/A
Interest Rate:	0.00%	Total Assessment Amount:	\$ 58,100.00
PID	PROPERTY ADDRESS	Owner	Fee
30.0500010	3115 CHASKA BLVD	KEYPORT PROPERTIES LLC	\$ 337.97
30.0500490	102 5TH ST W	HOLASEK FARMS LP	422.28
30.0500500	505 CHESTNUT ST N	THOMAS MARTINSON	79.31
30.0500510	500 PINE ST	CHASKA MILL PROPERTIES LLC	752.69
30.0501130	400 CHESTNUT ST N	WELLS FARGO BANK MN NA	1,352.58
30.0501140	NOT ADDRESSED	WELLS FARGO BANK MN NA	46.24
30.0501160	NOT ADDRESSED	WELLS FARGO BANK MN NA	63.59
30.0501170	416 CHESTNUT ST N	KD PROPERTIES CHASKA LLC	93.19
30.0501190	424 CHESTNUT ST N	ZEBU VENTURES 424 LLC	258.76
30.0501200	112 5TH ST E	DANIEL J HRON	576.61
30.0501231	415 CHESTNUT ST N	BBR ENTERPRISES LLC	159.95
30.0501250	413 CHESTNUT ST N	CALVIN & SHARON A HAASKEN	309.79
30.0501300	102 4TH ST W	AMERICAN LEGION CHASKA POST 57	717.99
30.0501720	200 3RD ST W	M A HENDRICKSON PROPERTIES LLC	699.82
30.0501800	115 4TH ST W	WILLIAM S & DANIELLE J MODELL	1,564.49
30.0501830	301 CHESTNUT ST N	KLEINBANK	3,055.07
30.0501840	300 PINE ST N	POSTAL BUILDING & LEASING CO	571.72
30.0501950	320 WALNUT ST N	CITY SQUARE LLC	779.64
30.0502700	122 3RD ST E	RONALD L FIEBELKORN	235.79
30.0502710	114 3RD ST E	NORMAN & KAROLINE L MONROE	82.37
30.0502730	108 3RD ST E	CENTER CUT PROPERTIES LLC	267.64
30.0502780	115 2ND ST E	ROY RANDALL CLAY JR AND TERESA L CLAY RE	331.23
30.0502800	107 2ND ST E	PT PROPERTIES CHASKA INC	134.94
30.0502820	200 CHESTNUT ST N	GESTACH PAULSON PROPERTIES LLC	382.47
30.0502830	206 CHESTNUT ST N	TODD REALTY LLC	120.96
30.0502840	208 CHESTNUT ST N	WESTERHOLM PROPERTIES LLC	227.83
30.0502850	210 CHESTNUT ST N	GM DAVIS PROPERTIES LLC	205.37
30.0502890	214 CHESTNUT ST N	M ELIZABETH SALON LLC	126.67
30.0502900	218 CHESTNUT	JOHN M & MARY H SIEGFRIED	182.61
30.0502910	222 CHESTNUT ST N	CHASKA RETAIL LLC	229.36
30.0502911	NOT ADDRESSED	JAMS PROPERTIES LLC	113.40
30.0503000	104 2ND ST W	JAMES L & MARY MAYERLE	220.17
30.0503010	110 2ND ST W	COMMUNITY ASSET FOUNDATION	156.58
30.0503021	114 2ND ST W	DCT PROPERTIES LLC	186.80
30.0503060	123 3RD ST W	MADSEN HOLDINGS LLC	277.95
30.0503061	218 PINE ST N	ON OCCASION LLC	315.61
30.0503070	115 3RD ST W	CHESTNUT PONY LLC	527.93
30.0503450	107 2ND ST W	TIMOTHY F & ANN V MCGLENNEN	147.50
30.0503470	101 2ND ST W	MELISSA R CRUZ	195.06
30.0503490	103 2ND ST W	MOSELLE HOLDINGS LLC	140.05
30.0503510	105 2ND ST W	A-OK PROPERTIES LLC	141.37
30.0503590	123 2ND ST W	RANDOLPH J & LISA MARIE KUBES	166.79
30.0503630	117 2ND ST W	TONIA R VANORDEN REV TRUST	181.08
30.0503650	113 2ND ST W	LARRY D ATNEOSEN	77.58
30.0503660	114 2ND ST E	DAVID L & KIMBERLY M SUDDUTH	106.46
30.0503670	112 2ND ST E	TRUST AGREEMENT OF RODNEY W RIESGRAF	72.78
30.0503680	116 2ND ST E	PRINCIPLE HOMES REALTY INC	106.57

PID	PROPERTY ADDRESS	Owner	Fee
30.0503760	112 CHESTNUT ST N	FPA RIVER GABLES ASSOCIATES LLC	91.76
30.0503800	110 2ND ST E	DOWNTOWN CHASKA RENTALS LLC	383.29
30.0720010	100 2ND ST E	KEVIN NORBY CHASKA LLC	179.65
30.0720020	102 2ND ST E	CD GEMINI PROPERTIES LLC	588.05
30.0720030	100 2ND ST E	KEVIN NORBY CHASKA LLC	217.62
30.1210010	500 CHESTNUT ST N	ASKE PROPERTIES LLC	470.36
30.1210020	510 CHESTNUT ST N	HANSONMN LLC	841.39
30.1210030	NOT ADDRESSED	HANSONMN LLC	128.92
30.1720010	NOT ADDRESSED	ADYME LLC	6.63
30.1720011	NOT ADDRESSED	ADYME LLC	13.37
30.1720022	516 PINE ST N	317 PROPERTIES LLC	149.74
30.1720030	3235 CHASKA BLVD	ADYME LLC	860.69
30.1720040	501 CHESTNUT ST N	ADYME LLC	306.02
30.1720050	NOT ADDRESSED	ADYME LLC	181.79
30.2910010	710 CHESTNUT ST N	CHASKA GROWTH HOLDINGS LLC	2,126.50
30.5460020	407 CHESTNUT ST N	SHIV LLC	386.15
30.5490010	411 CHESTNUT ST N	N & S PROPERTIES LLC	474.75
30.5550010	1 RIVER BEND PL	CHASKA LODGING MANAGEMENT LLC	2,059.65
30.6430010	710 WALNUT ST N	C H & C P KLEIN	1,138.12
30.6430030	805 YELLOW BRICK RD	805 YELLOW BRICK RD LLC	806.49
30.6440010	798 YELLOW BRICK RD	CHUNG H WONG	430.75
30.6440020	818 YELLOW BRICK RD	BRICKYARD CENTER ASSOC II	1,275.11
30.6460030	830 YELLOW BRICK RD	PASUB CORPORATION	511.08
30.6480020	800 WALNUT PL	PEPIN/SUMMIT PARTNERSHIP	47.16
30.6540010	3110 CHASKA BLVD	SUNSHINE GROVE ENTERPRISE INC	2,523.06
30.6560010	705 WALNUT ST N	CARVER COUNTY CDA	276.72
30.6580010	706 WALNUT ST N	BUR OAK PROPERTIES LLC	1,867.13
30.6580040	3050 CHASKA BLVD	ROCK HOLDINGS LLC	273.76
30.6890010	105 3RD ST W	KLEIN FINANCIAL INC	865.48
30.6890030	211 CHESTNUT ST N	WAGNER-HOVDE HOLDING CO	300.51
30.6890040	207 CHESTNUT ST N	CHESTNUT BUILDING LLC	1,483.34
30.6890050	207 CHESTNUT ST N	CHESTNUT BUILDING LLC	458.41
TOTAL CERTIFIED TO CARVER COUNTY			\$ 39,226.06

City/EDA Properties not certified to Carver County

30.0500020	NOT ADDRESSED	CHASKA CITY	51.14
30.0500030	NOT ADDRESSED	CHASKA CITY	17.66
30.0501290	112 4TH ST W	CHASKA CITY	211.80
30.0501850	300 CHESTNUT ST N	CHASKA CITY	8,152.52
30.0503020	NOT ADDRESSED	CHASKA CITY	296.12
30.0506000	NOT ADDRESSED	CHASKA CITY	5.21
30.5460030	NOT ADDRESSED	CHASKA CITY	61.24
30.0500660	NOT ADDRESSED	CHASKA ECONOMIC DEV AUTH	31.44
30.0501251	1 CITY HALL PLAZA	CHASKA ECONOMIC DEV AUTH	176.89
30.0501252	NOT ADDRESSED	CHASKA ECONOMIC DEV AUTH	3,410.69
30.0501940	314 WALNUT ST N	CHASKA ECONOMIC DEV AUTH	641.33
30.0502760	207 WALNUT ST N	CHASKA ECONOMIC DEV AUTH	50.93
30.1890010	NOT ADDRESSED	CHASKA ECONOMIC DEV AUTH	32.66
30.1890011	3210 CHASKA BLVD	CHASKA ECONOMIC DEV AUTH	5,293.55
30.5550050	NOT ADDRESSED	CHASKA ECONOMIC DEV AUTH	29.09
30.5550070	NOT ADDRESSED	CHASKA ECONOMIC DEV AUTH	36.75
30.6580020	NOT ADDRESSED	CHASKA ECONOMIC DEV AUTH	105.75
30.6580030	NOT ADDRESSED	CHASKA ECONOMIC DEV AUTH	224.97
30.6890020	219 CHESTNUT ST N	CHASKA ECONOMIC DEV AUTH	44.20
TOTAL ASSESSED TO CITY/EDA			\$ 18,873.94
GRAND TOTAL ASSESSED			\$ 58,100.00

REQUEST FOR ACTION

CHASKA CITY COUNCIL

10/18/2021

Subject: Reserve at Autumn Woods (fka Wagner Woods) – Preliminary Plat, Sale of Excess Land & Rezoning

Applicant: Lennar

Location: 9430 Audubon Road; west of Audubon Road (CR 15), south of Autumn Woods Drive

Case No.: 2021-16

Synopsis: Applicant seeks to obtain approval of a 86 lot development on approximately 45 acres of land owned by the Wagner family

Prepared By: Elizabeth Hanson

Staff Recommendation: Motion to adopt Resolution

BACKGROUND

Autumn Woods and Autumn Woods East abut the subject property. These plats were approved in September 1982 (Autumn Woods) and September 1994 (Autumn Woods East). Autumn Woods East 2nd Addition was approved October 1994, which included Ironwood Boulevard's right-of-way (ROW) stubbing at the southern edge of Wagner's property (9430 Audubon Road). This was with anticipation of the Wagner developing and connecting into such street.

In May 2021, the Concept Plan was approved for Wagner Woods (102 lots). At this time there was significant involvement from the neighboring residents with concerns pertaining to density, lot sizes, traffic/access, trail continuity, and being a part of the Jonathan Association. Tonight, we are looking at the next phase in the planning process and how the developer has addressed many of the concerns brought up during the Concept Plan.

Collaboration with City Staff, Neighbors and Developer

Over the course of the last few months city staff, the neighbors of Autumn Woods, and the developer have been meeting to go over the plans and the traffic. Some of these meetings included Carver County. The purpose of this was to land on a plan that was generally amenable to all, primarily from a traffic perspective. The plan proposed this evening is the outcome of such meetings. The latest meeting occurred on October 11th to go over remaining details (ie. Carver County road access for right-out and Jonathan Association pieces). It was verbalized by Carver County that the right-out access would be allowed under certain conditions. Jonathan also confirmed that the developer and the Association are close to signing an agreement to get the development signed over when Lennar is wrapped up on their end.

Park Board Update from 10/12 meeting

The Park Board met on 10/12 to review the Preliminary Plan for Reserve at Autumn Woods. They approved the plan as it is proposed this evening.

CONCERNS RAISED IN CONCEPT PLAN AND HOW THE PRELIMINARY PLAN ADDRESSES THESE:

Density: The original concept plan proposed 102 single-family lots. The new Preliminary Plan proposes 86 single-family lots; this is a 16 lot decrease from previous. The density changes from 2.57 units/acre to 2.17 units/acre.

Lot Sizes: The original concept plan proposed two different types of lots; 50 foot lots (27 lots) adjacent to Audubon Road, and 65 foot lots (75 lots). The new Preliminary Plan proposes 55 foot lots (20 lots) adjacent to Audubon Road, 65 foot lots (52 lots) and 75 foot lots (14 lots). The 75 foot lots are primarily situated on edges that abut existing Autumn Woods lots. In addition to lot sizes, the development will also provide 7.5 foot side setbacks for all lots. Previously 5 feet was shown on the 50 foot wide lots.

Traffic/Access: The original concept plan proposed access onto Autumn Woods Drive to the north, and connecting into Ironwood Boulevard to the south. The Preliminary Plan proposes the same layout, but will also include a direct right-out access onto Audubon Road on the eastern edge of the development. This access has been reviewed and approved by Carver County and will have to meet certain conditions. In addition, dedicated left and right turn lanes will be added to Autumn Woods Drive at the Audubon Road intersection to improve traffic movement. The south side of the development will also show Ironwood Boulevard tapering in four (4) feet so as to create more traffic calming measures for people traveling along this street. Stop signs will be installed at the Ironwood Boulevard and Butternut Drive intersection. A traffic study was also conducted to evaluate the proposed traffic and accesses into/out of the development as well as all major accesses of Autumn Woods. The study concluded that access from Autumn Woods Drive to the north and Ironwood Boulevard to the south provide the best traffic layout for the site and surrounding roadways; the right-out access will not provide significant decrease in delays at either access point. In addition, it showed that the development and surrounding streets/intersections in Autumn Woods will operate at serviceable levels once the development is fully built.

Trails: The concept plan showed the incorporation of trails to the stormwater ponds. There were comments raised in the concept plan review to show more trails that connect into the Jonathan trail system present in Autumn Woods. The Preliminary Plan proposes to incorporate more trail connections. One trail connection occurs on the south side of the site that will travel adjacent to the wooded area and wetland. Another trail connection is shown in the center of the site between the central block of homes and infiltration basin. This trail will generally line up with the entrance of the public park opening on the Northwest portion of the site. These new trail incorporations will be owned and maintained by the Jonathan Association.

Jonathan Association: Comments in the concept plan review encouraged the development to be a part of the Jonathan Association. The developer has been working with the Jonathan Association to get this development added to their HOA. The Jonathan Association will be owners of the tree preservation areas, trails, ponds, and other common areas. The City will maintain the ponds, however, as that is consistent with the other Autumn Woods developments.

Public Park: The concept plan showed the inclusion of a public park in the Northwest portion of the site totaling 2.65 acres. The Preliminary Plan now shows a public park totaling 3.13 acres, which its layout and size is more consistent with Park Board comments received in Concept Plan. A wider opening into this park from the development is also shown, which helps preserve the cluster of trees that were highlighted by staff in the Concept Plan to save. This acreage of park does not satisfy park dedication requirements, and the developer will be required to pay the remaining dedication requirements as a fee.

Reflection of Autumn Woods Characteristics: The concept plan review encouraged the Preliminary Plan to be more reflective of the abutting Autumn Woods developments as it related to trails, streets, open space, and lot layouts. As noted above, more Jonathan trail connections will be incorporated; 3,187 linear feet (1,473 linear feet was shown in Concept). Due to the Preliminary Plan showing less lots than Concept, the street system is now less extensive. Open Space has been increased from Concept Plan to be 18.07 acres of the total site acreage (13.97 acres was shown in Concept). Previously, the Concept Plan showed a total of 22 lots that would directly abut the existing Autumn Woods neighborhoods on the west and south sides. The Preliminary Plan now shows only 7 lots abutting the western side. These lots that directly abut will be 75 foot wide lots or be separated by a tree preservation area.

Project Goals

The identified goals in creating this new neighborhood include the following:

- Chaska's High Quality of Life is Enhanced
This community will offer existing Chaska residents, as well as various demographics of prospective buyers looking to live in Chaska, the opportunity to purchase a new home within the City. This neighborhood will provide homeowners access to retail, dining, golf courses, medical facilities, regional transportation, quality schools, parks and trails, and proximity to downtown Chaska. This community will also include a new City park.
- Taxpayers Perceive they are Getting Cost-Effective Service
As an infill development, all infrastructure is in place to serve the new homes. The City will receive a significant amount of infrastructure impact fees of which little will be expended with this development. In addition, the new homes will generate tax revenue, a significant increase from the current agricultural status of the property. This will aid the City in providing cost-effective services to Chaska residents.
- Well-Planned and Orderly Community Development is a Priority
Development of this infill site is highly efficient and desirable from an infrastructure and orderly growth standpoint. It makes efficient use of the significant amount of public infrastructure immediately accessible in public right-of-way. The proposed community with park dedication is consistent with the Low Density Residential and Park land use designations. And as mentioned, Lennar homes include quality materials including stone, vinyl, and LP in varying styles such as lap siding, shakes, and board and batten. Lennar's anti-monotony code will offer additional variation through the use of multiple color packages.
- A Sense of Community and Small Town Values are Maintained

Adding new residents to this location is ideal from the standpoint of the broader community. These new residents will strengthen and add vibrancy to the nearby restaurants, retail establishments, schools, and City parks and trail system. Downtown businesses are also likely to benefit from the addition of this community.

- **A Commitment to Excellence**

Excellence in this community will be evident in many ways:

- The plan considers tree preservation and wetlands, parkland dedication, and landscape buffering.
- Views of the neighborhood from the surrounding streets and within the neighborhood.
- Attractiveness of the homes and quality of home construction.

Comprehensive Plan

The Comprehensive Plan guides this area to be Low Density Residential. The proposal tonight is consistent with this guidance.

CURRENT PROPOSAL

The 86-lot detached single-family proposal on approximately 45-acres of property is located west of County Road 15 (Audubon Road) and south of Autumn Woods Drive. A public park is proposed on the northwest corner of the site. Ironwood Boulevard stubs off on the south edge of the Wagner property, which will provide an access into this site. This new development will be an extension off Ironwood Boulevard, and will ultimately be part of the Autumn Woods development, which surrounds the south, west and northwest sides of the site. Additional access will be provided from Autumn Woods Drive to the north, and a right-out access will be provided to Audubon Road (CR 15) to the east in between Autumn Woods Drive and Butternut Drive.

Adjacent properties

The site is bound on the north by Autumn Woods Drive; to the west by residential (Autumn Woods); the south by residential (Autumn Woods East) and a Jonathan-owned park; and the east by County Road 15 (Audubon Road) and the city of Chanhassen.

City-owned property abuts the north and northwest portion of the site. The site does not have direct frontage on Autumn Woods Drive to the north, but will buy the necessary acreage to have direct frontage.

Existing Conditions

The subject property is located at 9430 Audubon Road on the eastern edge of Chaska, and contains a farmstead with multiple out-buildings (all of which will be removed). The site is 45.47 gross acres in size and is currently farmed agricultural land with wooded areas on the southwest and northwest edges. Five wetlands have been delineated on the site totaling approximately 5 acres in size. There are wooded steep slopes surrounding the wetland on the north edge of the property, as well as a small steep slope area on the southern edge of the property.

Land Use

The proposed 45-acre plan consists of 86 new single family lots. Three lot sizes/products are proposed within this development (dubbed as Lennar's 'Landmark Series' and 'Discovery Series'); the Landmark Series; 66 lots) will be 65 and 75 foot wide lots and feature one-story and two-story homes with 3-car or 4-car garages (with basements); the Discovery Series (20 lots) will be 55 foot wide lots and feature one-story and two-story homes with 2-car or 3-car garages (basement and slab on grade plans).

The parcel of land that this development encompasses is currently zoned Open (O), which is a 'holding zone' until it develops. The area in question will be rezoned to a more appropriate zoning district, such as Planned Residential Development (PRD).

Layout

The layout of the site will come from the extension of Ironwood Boulevard to the south from the Autumn Woods development. The road will travel north-south near the easterly portion of the site to connect into Autumn Woods Drive on the north side to provide an additional access into the development (this connection will require purchasing City-owned land to access Autumn Woods Drive). This street extension will provide access to the 'Discovery Series' lots (20 lots) on its east side. A loop street (Sugar Maple Drive) will extend off the west side of the Ironwood Boulevard extension and provide access to the Landmark Series lots (66 lots). In addition, a right-out access will be provided on the east side of the site to connect into Audubon Road (CR 15).

A public park space totaling 3.13 acres is denoted in the northwest portion of the site. A park access is shown between lots 40 and 41. This park space will connect into the City-owned property that abut the north and northwest portions of the site.

Transportation/Traffic/ROW/Construction Traffic

The Preliminary Plan proposes to provide for a network of internal residential roadways with connectivity to arterial roadways. Specifically, Ironwood Boulevard is extended to the north to provide access to the development area. This street will connect into Autumn Woods Drive. A right-out access on the east side of the development will provide access out on to County Road 15 (Audubon Road). County Road access will also come from Autumn Woods Drive to the north and Ironwood Boulevard/Butternut Drive to the south. A loop street (Sugar Maple Drive) will extend off the west side of Ironwood Boulevard to access the internal lots.

A traffic impact analysis (TIA) was completed for this preliminary submittal. The traffic study evaluated the impacts of the development on the internal streets as well as looked at all major intersections of Autumn Woods. In brief summary, it concluded that all intersections will operate at a serviceable level with the build-out of the development. It also concluded that the scenario showing access onto Autumn Woods Drive and Ironwood Boulevard extending to the south would be the best traffic scenario for the development and surrounding neighborhoods. The Autumn Woods Drive and Audubon Road intersection will be improved to include a dedicated left and right turn lane on Autumn Woods Drive. The full TIA and a summary of such are included as attachments.

The current preliminary plan appears to show road right-of-way widths that are consistent with the City's typical 60 foot wide ROWs as they are matching up with the stub street of Ironwood

Boulevard. One area of exception is the width of Ironwood Boulevard near the south side of the development site. This area will taper in a couple feet (4 feet) to help promote traffic calming measures. The incorporation of this is to promote people to slow down as they are coming south and north along Ironwood Boulevard.

Construction traffic is proposed to be accessed off of Autumn Woods Drive to the north of the development. The existing Wagner driveway access on Audubon Road (CR 15) was looked at for a temporary construction access, however, Carver County deemed this access to be unsafe. They suggested that the Autumn Woods Drive access be used instead. Formal approval of such construction traffic access has yet to be given by Carver County.

Traffic Calming Methods (Inside and Outside of Reserve at Autumn Woods)

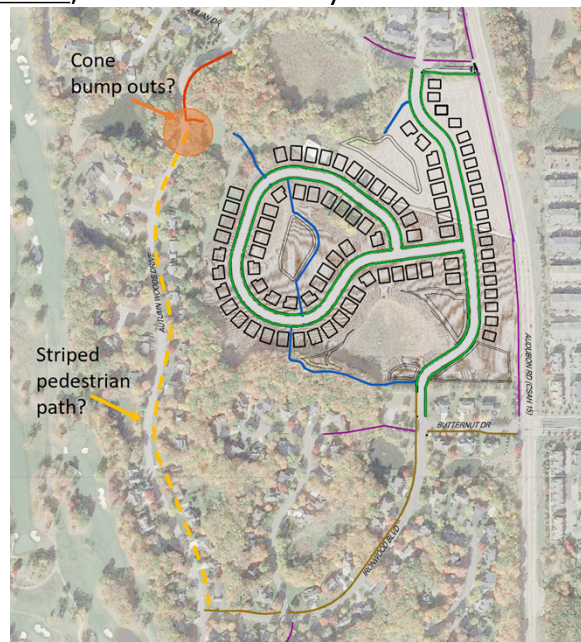
Traffic is a major concern with this proposed development and with the existing Autumn Woods neighborhoods. Because of this it seemed imperative to review traffic calming measures inside and outside of the proposed development to see where (if any) improvements can occur. Staff, the developer and residents reviewed the preliminary plans prior to submittal in regards to how to provide better traffic calming measures in the development and outside the development on Ironwood Boulevard, Autumn Woods Drive, and Butternut Drive. The traffic calming measures are summarized below indicating what will be installed with this development, and other methods that can continue to be explored moving forward:

Traffic Calming Methods to be Installed with Development:

- Ironwood Blvd Tapering; within the proposed Reserve at Autumn Woods development Ironwood Boulevard will be tapered down four (4) feet on the south side of the development. This will help promote reduced speeds as people are traveling north and south along this road.
- Stop Signs added to Ironwood and Butternut Drive; to better control traffic moving out of the development stop signs will be added on the north and south sides of Ironwood Boulevard as it intersects Butternut Drive.
- Dedicated Turn Lanes on Autumn Woods Drive; there are currently no dedicated turn lanes on Autumn Woods Drive at the Audubon Road intersection. Because of this, people are single-lane stacked when waiting to turn left or right; if there is a person turning left they are generally creating more wait for everyone behind them. Autumn Woods Drive will be widened at the intersection to include dedicated left and right turn lanes to improve traffic turning movements here.

Traffic Calming Methods for Continued Exploration and Implementation:

- Pedestrian Striping and Cones on Autumn Woods Drive; it was brought up during Concept Plan review and the subsequent meetings with residents that Autumn



Woods Drive is not a safe road. There are no sidewalks for pedestrians to use, and it appears that cut-through traffic occurs. The exhibit to the right shows a small stretch of pedestrian trail that is included at the proposed public park entrance on Autumn Woods Drive up to Julian Drive to the north (red); this is to be further discussed with the Jonathan Association of its installation. A couple other measures for further studying/evaluation were discussed to potentially mitigate safety concerns on this road. One method was to provide striping along the east side of Autumn Woods Drive from Ironwood Boulevard up to the proposed public park entrance that would be dedicated to pedestrians walking along this road. Parking would be minimized to one side of the road on the west side. In addition, it was discussed to include cones mimicking bump outs to be added near the proposed park entrance. This bump-out method would essentially lessen the road width and make cars slow down, or be more cautious, as they approach this area. It should be noted, that both these methods are more temporary implementations initially. If these methods prove to be successful in the field, then more permanent installations of such methods could occur. The methods and scope of implementation have only been briefly considered as it would be important to include more residents in the discussion since these implementations would be primarily used near them, and come at a cost of the residents if installed. These methods can continued to be discussed during and after the development so that appropriate measures are taken.

- Butternut Drive Median Modification; there is currently a sizeable median at the intersection of Butternut Drive and Audubon Road. There are homes that are located on both sides of Butternut Drive. The median does not allow some of the homes to make full turning movements into their driveways. In addition, the median doesn't allow for dedicated turn lanes on to Audubon Road. An alternative to this intersection was explored that can implement a smaller median that doesn't block driveways, and have dedicated turn lanes. The homeowners along Butternut Drive prefer to leave the median as it sits today. This alternative can be implemented at a later time if the homeowners wish, but it would be an expense they would be responsible for.

Utilities

Sewer and water utilities are available.

Stormwater

Stormwater ponding is proposed as a part of this proposal; ponding areas have been delineated on the plan mainly situated around the large wetland on the south side of the site. Maintenance accesses are shown for all ponds, and some are doubling as pedestrian trails. Stormwater ponding will have to meet all Riley Purgatory BCWD and City standards.

Setbacks

Minimum setbacks proposed are front setbacks of 25 feet, rear setbacks of 25 feet, side setbacks of 7.5 feet, and corner setbacks are 20 feet. In addition to the above, the development must meet the following setbacks:

SETBACKS	
Direction	Setback
Wooded Steep Slopes	50 feet building setback and 30 feet no grade/no mow setback
Wetlands	30 feet
County Road 15	125 feet from centerline

The lots that abut the wooded steep slope edges on the north edge of the site are now shown to be out of the 30 foot no grade/no mow setback. The 30 foot setback does not allow fences to be built on or within it so it's better that these setbacks are not within property lines.

Architecture & Anti Monotony

Lennar will be the sole builder in this development. The Landmark Series noted above will be 50-60 foot wide homes, ranging in price from \$500,000-600,000. The Discovery Series will be 40 foot wide home, ranging in price from \$450,000-\$500,000. Lennar homes include varying amounts of stone on front facades and siding materials consist of lap siding, shakes, or board and batten. Other architectural features available on selected facades include columns, gables, shutters, accentuated window trim and fascia, and decorative roof brackets and cornices. They have provided a couple home examples they offer as an attachment in the packet.

City ordinance dictates that housing may not be similar within two houses to each side, directly across the street or diagonal from the house in question. This ordinance also requires that homes provide LP Smartside on the front elevations, at least 4 inch window trim on all windows, and provide varied color packages on homes within one home on each side and directly across the street. This ordinance has been very successful in other newer residential developments.

Trails & Sidewalks

There are a couple trails proposed as a part of this development. These trails will be Jonathan owned and maintained. These trails exist on the south side of the site adjacent to the wetland/ponding area, and in the center of the site adjacent to the infiltration basin area. A public trail already exists on the west side of County Road 15 (Audubon Road), which will be connected by the development's proposed sidewalks (one on the northeast side at Autumn Woods Drive; and one on the east side at the new right-out access). Another trail connection is shown on the NW side of the site at the proposed public park entrance on Autumn Woods Drive, which would connect north up to Julian Drive. This connection needs to be further discussed with Jonathan on its implementation.

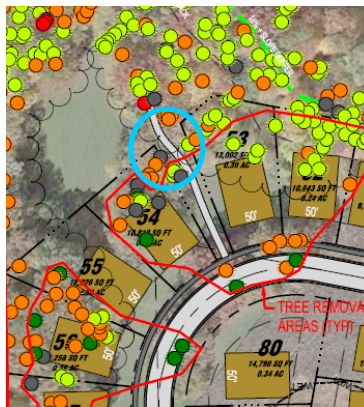
The developer will be required to provide sidewalks on both sides of the streets per City policy. The preliminary plan is showing sidewalks on both sides of the street. In addition, a sidewalk extension on the south side of Autumn Woods Drive is being proposed that connects the development entrance out to the County Road trail. Another extension is shown that connects the easterly sidewalk on Ironwood Boulevard to connect into Butternut Drive, which will ultimately connect into the proposed pedestrian crossing across the Ironwood Boulevard and Butternut Drive intersection. A pedestrian crossing was considered on Ironwood Boulevard at the proposed Jonathan trail adjacent to the wetland, however, this location was deemed unsafe; the City does not encourage mid-block crossings due to safety reasons.

Screening, Landscaping & Tree Preservation

Because this development abuts a major roadway (Audubon Road; CR 15) it will be important that the homes that back up to this have adequate screening. The development north of Autumn Woods Drive (Lake Hazeltine Woods) provides berming and landscaping on its east edge along the County Road. Staff would require this same screening to be carried all the way through the east side of Wagner Woods. The preliminary plan is showing a level of screening occurring and the applicant states that approximately 90 trees will be added to this area. The plan is also showing a section drawing of the proposed berm and landscaping to be added, which appears to be adequate and consistent with the townhome development to the north.

Trees will be required in the boulevard in order to meet the City's Boulevard Tree Policy. It should be noted that the boulevard is the area between the sidewalk and the street.

A level of Tree Preservation is an important piece of this development. The applicant has conducted and submitted a tree survey as a part of this proposal showing the location and condition of the trees. Wooded areas exist on the southwest, northwest, and north portions of the site. 722 trees were inventoried on the site. The developer is showing certain areas for tree preservation (574 trees saved; 148 trees proposed to be removed), mainly along the south edge, and northwest edges of the site in rear yards and in the public park area. The south and some northwest edge trees to be preserved are proposed to be in an outlot or tree preservation easement that will be deeded to/maintained by the Jonathan HOA. Tree preservation will also occur in the area slated for public park on the northwest side. There were trees noted in concept plan near the entrance of this park that would be beneficial in preserving (oak trees ranging from 29" to 41" in caliper that are in Excellent and Good conditions; trees 1208, 1215, 1220, and 1221; these trees are in the general area circled in blue below) and provide a natural grand entrance to the park for the development. The preliminary plan has been modified to provide a wider opening into the park, which now preserves those trees.



Parkland, Park Board Recommendations From Concept Plan & Park Board Update

The Comprehensive Plan guides a portion of this area of land for a neighborhood park. The Comprehensive Plan shows the park space on the south side of the site as a connection to the Jonathan-owned park in Autumn Woods, however, after a site visit it appeared that the northwest portion of the site was the most viable/ideal location for a public park. This area would be able to contiguously connect into City-owned land that abuts the north and northwest sides of the site. It also provides an open pocket area nestled between trees, making it very idyllic. The south side of the site is encumbered by a wetland and abuts a Jonathan-owned

park, which does not lend itself well for a public park. The park space proposed is showing a total of 3.13 acres (does not include wetland or wooded steep slope areas as these areas do not count as acceptable park space), which falls below the park dedication requirements for this size of site. It will be required of the developer to pay park dedication fees for the remainder of park dedication requirements; the Park Board will review and approve the amount of park acreage that will be accepted as public park dedication.

Previously the Park Board met on the Concept Plan (May 11, 2021) and recommended the following:

- The City receive a minimum of 2.65 acres of park dedication in land, with a strong recommendation for additional land, and receive the balance of park dedication in cash.
- Further recommendation is to omit Lennar's proposed park land dedication starting at northwest corner of lot 52 and everything east from there, and to omit lots 53, 54, and 55 to achieve the minimum 2.65 acres all contiguous on the northwest corner of the site.

It would appear that the developer has incorporated these comments into their preliminary plan. The Park Board met on Tuesday, October 12th to review the preliminary plan, and have approved the plan as it is proposed.

Jonathan Association & Update

As noted previously, the Jonathan Association plans to take over this development once it's built out. They will be the owners and maintainers of the tree preservation areas, trails, ponds, and other common areas. City staff, the developer and the Jonathan Association met on Monday, October 11th and they both confirmed that the developer and the Association are close to signing an agreement to get the development signed over when Lennar is wrapped up on their end.

Preliminary Plat

The preliminary plat shows the platting of 86 single-family lots. The disposition of outlots are as follows:

- **Outlot A:** public park space to be deeded to the City of Chaska
- **Outlot B:** wooded steep slope, wetland, and ponding area to be owned by the Jonathan HOA
- **Outlot C:** trail and ponding area to be owned by the Jonathan HOA
- **Outlot D:** trail, wetland, and ponding area to be owned by the Jonathan HOA
- **Outlot E:** ponding area to be owned by the Jonathan HOA
- **Outlot F:** monument sign area to be owned by the Jonathan HOA

Development Costs (Infrastructure Improvements)

The City of Chaska has a number of area-wide development cost such as, but not limited to:

- Sewer and water area fees
- Storm Sewer
- Trails
- Parks

Prior to final platting, the developer will need to work with City Staff to determine which of these are applicable and what those fees will be.

Rezoning

The development is requesting to be rezoned from Open (O) to Planned Residential District (PRD-79). A draft ordinance of this zoning district is attached.

City Land Purchase/Acquisition

The development currently does not have direct frontage on Autumn Woods Drive; there is a small sliver of City owned land that runs between the Wagner's property and Autumn Woods Drive (see in blue below). Because of this the developer will be required to purchase a portion of the land needed for the street access (see exhibit on right below). The developer will be purchasing this sliver from the City at the same per acre charge that they bought the Wagner property for.



Deadline for Agency Action

The City of Chaska received the complete application for this request on September 22, 2021. Pursuant to Minnesota State Statutes the City must act on this request by **Sunday, November 21, 2021 (60 days)**, unless the City provides the petitioner with written reasons for an additional 60-day review period. The additional review period would extend to Thursday, January 22, 2022. The City may with the petitioner's consent extend the review period beyond the Thursday, January 22, 2022 date. Lastly, if the City denies the petitioners request "... it must state in writing the reasons for the denial at the time it denies the request."

PLANNING COMMISSION ACTION TAKEN 10/13/21:

Motion to recommend to City Council approval of the preliminary plat for Reserve at Autumn Woods for a 86-lot subdivision on 45 acres of land, subject to the following conditions:

1. Approvals shall be based on the following graphic exhibits:
 - a. Narrative (pgs 1-6), prepared by Josh Metzger of Lennar, undated
 - b. Title Sheet General Information (pg 1), prepared by ISG, dated July 6, 2021
 - c. Typical Street Section and Details (pg 2), prepared by ISG, dated July 6, 2021
 - d. Site Details (pgs 3-4), prepared by ISG, dated July 6, 2021
 - e. Retaining Wall – Fence Plan and Details (pg 5), prepared by ISG, dated July 6, 2021
 - f. Stormwater Basin Details (pgs 6-8), prepared by ISG, dated July 6, 2021
 - g. Preliminary Plat (pg 9), prepared by ISG, dated July 6, 2021
 - h. SWPPP Narrative (pg 10), prepared by ISG, dated July 6, 2021
 - i. SWPPP Details (pgs 11-12), prepared by ISG, dated July 6, 2021
 - j. Proposed SWPPP (Overall) (pg 13), prepared by ISG, dated July 6, 2021
 - k. Proposed SWPPP (NW) (pg 14), prepared by ISG, dated July 6, 2021
 - l. Proposed SWPPP (NE) (pg 15), prepared by ISG, dated July 6, 2021
 - m. Proposed SWPPP (SW) (pg 16), prepared by ISG, dated July 6, 2021
 - n. Proposed SWPPP (SE) (pg 17), prepared by ISG, dated July 6, 2021
 - o. Existing Site & Removal Plan (pg 18), prepared by ISG, dated July 6, 2021

- p. Overall Site Plan (pg 19), prepared by ISG, dated July 6, 2021
 - q. Autumn Woods Dr. Proposed Improvements (pg 20), prepared by ISG, dated July 6, 2021
 - r. West Property Lot Comparison Exhibit (pg 21A), prepared by ISG, dated July 6, 2021
 - s. Utility Plan (Overall) (pg 22), prepared by ISG, dated July 6, 2021
 - t. Utility Plan (NW) (pg 23), prepared by ISG, dated July 6, 2021
 - u. Utility Plan (NE) (pg 24), prepared by ISG, dated July 6, 2021
 - v. Utility Plan (SW) (pg 25), prepared by ISG, dated July 6, 2021
 - w. Utility Plan (SE) (pg 26), prepared by ISG, dated July 6, 2021
 - x. Hydrant Coverage Map (pg 27), prepared by ISG, dated July 6, 2021
 - y. Grading Plan (Overall) (pg 28), prepared by ISG, dated July 6, 2021
 - z. Grading Plan (NW) (pg 29), prepared by ISG, dated July 6, 2021
 - aa. Grading Plan (NE) (pg 30), prepared by ISG, dated July 6, 2021
 - bb. Grading Plan (SW) (pg 31), prepared by ISG, dated July 6, 2021
 - cc. Grading Plan (SE) (pg 32), prepared by ISG, dated July 6, 2021
 - dd. Wetland Buffer and Signage (pg 33), prepared by ISG, dated July 6, 2021
 - ee. Traffic Control Plan (Signage) (pg 34), prepared by ISG, dated July 6, 2021
 - ff. Emergency Vehicle Access Plan (pg 35), prepared by ISG, dated July 6, 2021
 - gg. Restoration and Planting Plan (pg 36), prepared by ISG, dated July 6, 2021
 - hh. Planting and Utility Plan (Overall) (pg 37), prepared by ISG, dated July 6, 2021
 - ii. Planting Notes and Details (pg 38), prepared by ISG, dated July 6, 2021
 - jj. Overall Tree Preservation (pg 39), prepared by ISG, dated July 6, 2021
 - kk. Tree Preservation A (pg 40), prepared by ISG, dated July 6, 2021
 - ll. Tree Preservation B (pg 41), prepared by ISG, dated July 6, 2021
 - mm. Tree Preservation C (pg 42), prepared by ISG, dated July 6, 2021
 - nn. Tree Preservation D (pg 43), prepared by ISG, dated July 6, 2021
 - oo. Tree Survey A (pg 44), prepared by ISG, dated July 6, 2021
 - pp. Tree Survey B (pg 45), prepared by ISG, dated July 6, 2021
 - qq. Tree Survey C (pg 46), prepared by ISG, dated July 6, 2021
 - rr. Traffic Impact Analysis – Draft, prepared by ISG, dated September 3, 2021
2. Adherence with the City Engineer's Memo dated October 6, 2021.
 3. Adherence with the Carver County Public Works memo dated October 13, 2021.
 4. Provision that all lot lines are outside 30 foot no grade/no mow setback of wooded steep slopes.
 5. Preservation of the wooded steep slopes, including 30-foot buffer and a 50-foot setback from that wooded steep slope.
 6. Provision that all lot lines are outside of wetland areas and their required buffers.
 7. Adherence to the City's Boulevard Tree Policy and local street section design.
 8. Provision that boulevard trees are placed between the sidewalk and street.
 9. Provision of adequate berming and landscaping along east edge abutting County Road 15 consistent with the preliminary landscape plan.
 10. Provision of sidewalks on both sides of all local streets.
 11. Adherence to the following building setbacks:
 - a. Front (house): 25 feet
 - b. Rear: 25 feet
 - c. Side (Landmark Series and Discovery Series): 7.5 feet
 - d. Side (corner): 20 feet
 12. Adherence to the 125 foot centerline building setback from County Road 15.
 13. Prior to final plat approval, developer shall enter into an agreement with the City for the provision of necessary infrastructure and associated development costs.
 14. Compliance with the City's anti-monotony and design requirements zoning ordinance

(Section 9.28).

15. Provision of LP Smartside used on all front elevations, and 4 inch window trim on all windows.
16. Provision of developer responsibility to remove any hazardous trees or limbs on site as determined by the Public Works Director, prior to issuance of a building permit.
17. Provision of a storm water management plan meeting City and Riley Purgatory BCWD standards.
18. Provision that adequate maintenance accesses are provided for the stormwater ponds.
19. Provision of an approved construction traffic plan by Carver County to be submitted at final submittal.
20. Direct right-out access onto County Road 15 (Audubon Road) shall be shown on the plans and receive approval by Carver County prior to recording of the final plat.
21. Right-out access to accommodate life safety for emergency service and to be coordinated with Engineering and City fire department.
22. Provision to include the Reserve at Autumn Woods development into the Jonathan Association.
23. Provision that the remaining park dedication requirements be provided in cash.
24. Provision that the monument sign adhere to zoning Section 10 sign regulations, and a sign permit obtained prior to installation.
25. Provision of a construction traffic plan including routes and signage to be submitted at final submittal.
26. Installation of turn lanes on Autumn Woods drive to be completed prior to issuance of first Certificate of Occupancy in Reserve at Autumn Woods, and with final ware-course on turn lane improvements to be installed after full construction of development.
27. Installation of berming on east side of Reserve at Autumn Woods to be completed prior to issuance of first Certificate of Occupancy.
28. Provision of adequate screening applied on the south edge of the site between Ironwood Boulevard and Audubon Road, and to show on the landscape plan for final submittal.

Motion to recommend approval of the rezoning of Reserve at Autumn Woods from Open (O) to Planned Residential District (PRD-79).

Motion to recommend approval of the sale of excess City property south of Autumn Woods Drive and west of Audubon Road.

CITY COUNCIL ACTION REQUESTED

Motion to adopt Resolution No. 2021-67 approving the preliminary plat and the sale of excess City property south of Autumn Woods Drive and west of Audubon Road for Reserve at Autumn Woods for a 86-lot subdivision on 45 acres of land (PC # 2021-16)

Motion to adopt Ordinance No. 1001 approving the rezoning of Reserve at Autumn Woods from Open (O) to Planned Residential District (PRD-79).

ORDINANCE NO. 1001

AN ORDINANCE AMENDING ORDINANCE NO. 229 (ZONING ORDINANCE) OF THE CITY OF CHASKA BY REZONING CERTAIN REAL ESTATE WITHIN THE CITY OF CHASKA FROM THE OPEN (O) ZONING DISTRICT TO PLANNED RESIDENTIAL DEVELOPMENT DISTRICT NO. 79 (PRD-79) AND BY ESTABLISHING PERMITTED USES AND REGULATIONS FOR PRD-79 (RESERVE AT AUTUMN WOODS)

THE CITY COUNCIL OF THE CITY OF CHASKA DO ORDAIN:

Section I. **Rezoning.** The boundaries of the Zoning Districts as established by Ordinance No. 229 and as shown on the Zoning Map of Chaska, Minnesota are hereby amended as follows:

The following described real estate situated in the City of Chaska is hereby removed from the Open Zoning District (O) and rezoned to Planned Residential Development District No. 79 (PRD-79) for all of Blocks 1-5 of Reserve at Autumn Woods.

The following graphic exhibits shall serve as the general guide for development of the Reserve at Autumn Woods area:

1. Title Sheet General Information (pg 1), prepared by ISG, dated July 6, 2021
2. Typical Street Section and Details (pg 2), prepared by ISG, dated July 6, 2021
3. Site Details (pgs 3-4), prepared by ISG, dated July 6, 2021
4. Retaining Wall – Fence Plan and Details (pg 5), prepared by ISG, dated July 6, 2021
5. Stormwater Basin Details (pgs 6-8), prepared by ISG, dated July 6, 2021
6. Preliminary Plat (pg 9), prepared by ISG, dated July 6, 2021
7. SWPPP Narrative (pg 10), prepared by ISG, dated July 6, 2021
8. SWPPP Details (pgs 11-12), prepared by ISG, dated July 6, 2021
9. Proposed SWPPP (Overall) (pg 13), prepared by ISG, dated July 6, 2021
10. Proposed SWPPP (NW) (pg 14), prepared by ISG, dated July 6, 2021
11. Proposed SWPPP (NE) (pg 15), prepared by ISG, dated July 6, 2021
12. Proposed SWPPP (SW) (pg 16), prepared by ISG, dated July 6, 2021
13. Proposed SWPPP (SE) (pg 17), prepared by ISG, dated July 6, 2021
14. Existing Site & Removal Plan (pg 18), prepared by ISG, dated July 6, 2021
15. Overall Site Plan (pg 19), prepared by ISG, dated July 6, 2021
16. Autumn Woods Dr. Proposed Improvements (pg 20), prepared by ISG, dated July 6, 2021
17. West Property Lot Comparison Exhibit (pg 21A), prepared by ISG, dated July 6, 2021
18. Utility Plan (Overall) (pg 22), prepared by ISG, dated July 6, 2021
19. Utility Plan (NW) (pg 23), prepared by ISG, dated July 6, 2021
20. Utility Plan (NE) (pg 24), prepared by ISG, dated July 6, 2021
21. Utility Plan (SW) (pg 25), prepared by ISG, dated July 6, 2021
22. Utility Plan (SE) (pg 26), prepared by ISG, dated July 6, 2021
23. Hydrant Coverage Map (pg 27), prepared by ISG, dated July 6, 2021
24. Grading Plan (Overall) (pg 28), prepared by ISG, dated July 6, 2021
25. Grading Plan (NW) (pg 29), prepared by ISG, dated July 6, 2021
26. Grading Plan (NE) (pg 30), prepared by ISG, dated July 6, 2021
27. Grading Plan (SW) (pg 31), prepared by ISG, dated July 6, 2021
28. Grading Plan (SE) (pg 32), prepared by ISG, dated July 6, 2021
29. Wetland Buffer and Signage (pg 33), prepared by ISG, dated July 6, 2021

- 30. Traffic Control Plan (Signage) (pg 34), prepared by ISG, dated July 6, 2021
- 31. Emergency Vehicle Access Plan (pg 35), prepared by ISG, dated July 6, 2021
- 32. Restoration and Planting Plan (pg 36), prepared by ISG, dated July 6, 2021
- 33. Planting and Utility Plan (Overall) (pg 37), prepared by ISG, dated July 6, 2021
- 34. Planting Notes and Details (pg 38), prepared by ISG, dated July 6, 2021
- 35. Overall Tree Preservation (pg 39), prepared by ISG, dated July 6, 2021
- 36. Tree Preservation A (pg 40), prepared by ISG, dated July 6, 2021
- 37. Tree Preservation B (pg 41), prepared by ISG, dated July 6, 2021
- 38. Tree Preservation C (pg 42), prepared by ISG, dated July 6, 2021
- 39. Tree Preservation D (pg 43), prepared by ISG, dated July 6, 2021
- 40. Tree Survey A (pg 44), prepared by ISG, dated July 6, 2021
- 41. Tree Survey B (pg 45), prepared by ISG, dated July 6, 2021
- 42. Tree Survey C (pg 46), prepared by ISG, dated July 6, 2021
- 43. Traffic Impact Analysis – Draft, prepared by ISG, dated September 3, 2021

Section II.

PRD-79 District regulations. Permitted uses and regulations applicable to the PRD-79 District is hereby amended to read as follows:

A. Intent

The intent of PRD-79 is to create a Low Density Residential neighborhood that is sensitive and connected to the natural amenities of its area while providing a community that is generally cohesive and connected with the surrounding Autumn Woods neighborhoods.

B. Detached Single Family

The following described real estate shall be limited in its use to Detached Single Family all of Blocks 1-5 of the recorded plat of Reserve at Autumn Woods, Carver County, Minnesota.

1. Permitted Uses shall be those as found in the R1-Low Density Residence, zoning ordinance Section 3.1.2.2, Special uses shall be those as found in the zoning ordinance Section 3.1.2.3, and Accessory uses shall be as found in the zoning ordinance Section 3.1.2.4.
2. The principle building setbacks for the development shall be:
 - a. Front, house: 25 feet
 - b. Rear: 25 feet
 - c. Side: 7.5 feet
 - d. Side, corner: 20 feet
 - e. County Road 15 (Audubon Road): 125 feet from centerline
3. The accessory structure setbacks for the development shall be:
 - a. Front: 25 feet
 - b. Rear: 10 feet
 - c. Side, corner: 20 feet
 - d. Side, interior: 5 feet
 - e. County Road 15 (Audubon Road): 125 feet from centerline
 - f. In addition, no swimming pools or other recreational courts or appurtenant equipment shall be located in a front or side yard. Setbacks shall be measured from the impervious surfaces of such uses.

4. Preservation of the wooded steep slopes, including 30-foot buffer and a 50-foot building setback from the edge of that wooded steep slope.
5. Preservation of trees as denoted in the Tree Preservation Plan.
6. 360-degree architecture shall be provided for all corner lots and all lots whose rear or sides are visible from public right's-of-way or across from open spaces, more specifically for these lots as seen in the preliminary plat approved October 18, 2021:
 - a. Lots 1-20
 - b. Lots 28-29
 - c. Lots 40-41
 - d. Lots 64-66
7. Compliance with the City's anti-monotony and design requirements zoning ordinance (Section 9.28).
8. Provision of LP Smartside used on all front elevations, and 4 inch window trim on all windows.
9. Maximum height shall be 35 feet for principal structures.

C. Monument Signs

Monument Signs as regulated by the following:

1. Adhere to Section 10 of the zoning ordinance
2. Cannot be internally illuminated
3. Will be maintained by the HOA

D. Outlots

The following described real estate shall be limited in its use to:

- a. Outlot A: public park space to be deeded to the City of Chaska
- b. Outlot B: wooded steep slope, wetland, and ponding area to be owned by the Jonathan HOA
- c. Outlot C: trail and ponding area to be owned by the Jonathan HOA
- d. Outlot D: trail, wetland, and ponding area to be owned by the Jonathan HOA
- e. Outlot E: ponding area to be owned by the Jonathan HOA
- f. Outlot F: monument sign area to be owned by the Jonathan HOA

Section III. Effective Date. This Ordinance shall be in full force and effect from and after its date of passage, adoption, and publication according to law. Passed and adopted by the City Council of the City of Chaska, Minnesota this 18th day of October, 2021.

Windschitl, Mayor

Attest: _____
Deputy Clerk



City of Chaska Memorandum

To: Planning Commission
From: Matt Clark
Date: October 6, 2021
Subject: Reserve at Autumn Woods Preliminary Plat

The proposed Wagner property home development site accounts in total of over 45 acres and lies on the norther eastern edge of Chaska bounded by the Autumn Woods neighborhood and Audubon road. The proposed development consists of an 86 single family home development that will be served by extensions of new public streets and utilities. The Engineering comments on the proposed preliminary plan are as follows:

1. Street and Utility Improvements

a. Traffic Impact Study

- a. The traffic impact study for the development that was performed reviewed multiple access scenarios. The layout that is proposed reflects those changes with two primary access points from the neighborhood and concluded the following recommendations:
 - i. To reduce delays at the Autumn Woods Drive Intersection the layout shall provide access both to Autumn Woods Drive located to the north as well as to Ironwood Drive located to the south.
 - ii. By providing these connections, similar LOS (level of service) and delay times for a majority of the intersections are anticipated for both the 2023 opening and the forecasted 2043 traffic volumes.
 - iii. Providing only a single exit to the north may increase the use of alternative routes through the existing neighborhood due to the high delays that occur at the Autumn Woods Drive/Audubon Road intersection.
 - iv. Providing a south access to the existing road stub of Ironwood Boulevard provides better connectivity without compromising safety at the Autumn Woods/Audubon Road intersection.
 - v. A right out only access from the development does not provide a significant impact in decreasing delays at either primary county road access point. Rather may serve as an ancillary access to reducing trips through the connecting neighborhood street.

b. Street Improvements

- a. Required improvements that are to be incorporated into the development are providing a dedicated turn lanes at the Autumn Woods Drive intersection. Further, signal timing adjustments will need to be coordinated with Carver County to better manage operations at as future development occurs and traffic growth increases along Audubon Road.
- b. The right-out access should it be deemed an allowable access onto the County Highway and be designed according to County highway standards. Further, the access needs to accommodate life safety for emergency service and coordinated with Engineering and City fire department.

2. Sanitary Sewer/Water main - Gravity sanitary sewer and water main piping stubs are currently in place at the north stub street of Ironwood Boulevard and are available to service the site. Construction plans shall follow the City's engineering design standards.

3. Wetlands – A wetlands study and delineation report have been completed for the development that has identified 5 different wetland areas that are shown on the attached wetlands exhibit. Of the 5 acres of wetlands that exists, the layout proposes 1.2 acres of impacts to wetlands B, C, E, and a portion of D and be mitigated with the purchase of wetland credits through state agencies.

4. Storm water – There are six different ponding areas that are planned with the new development to meet the appropriate state, city, and watershed requirements that apply. Storm water is proposed to be handled through two types of treatment, infiltration as well as traditional wet ponding both of which are acceptable standards. The internal basin E of the plan is considered a landlocked basin and will need to be modeled for back to back 100 year rain events with the outlet system and grading plan incorporating City design standards.

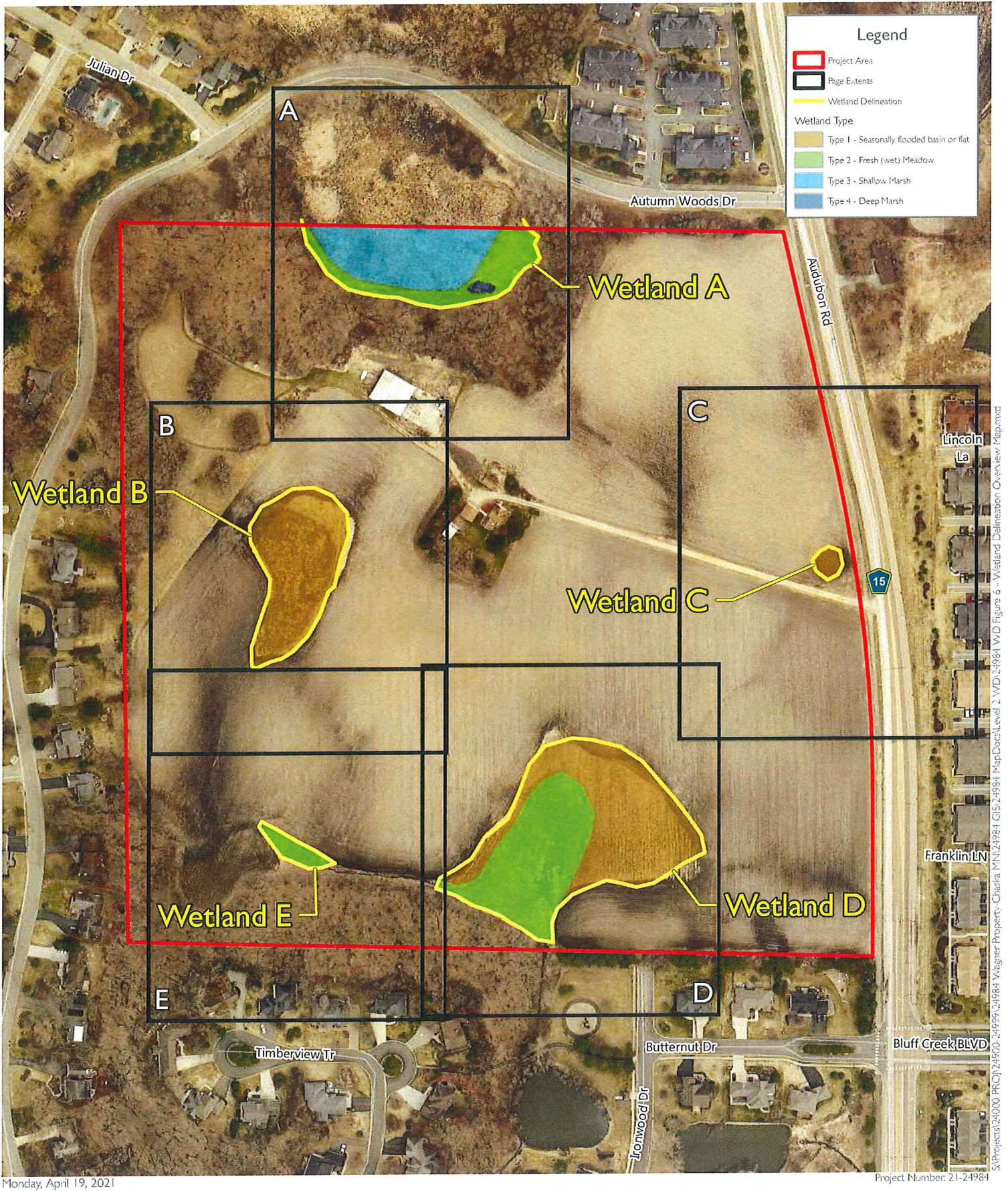
The proposed layout continues to preserve and enhance the wet meadow portion of the large south wetland and does a nice job in complementing the City's overall goals to enhance and preserve the unique natural amenity over the property. The system that is being design also proposes to meet the City's goal to reducing the overall runoff rate downstream. Prior to City approvals for stormwater the wetland agencies will need to approve amendments to the wetland area.

5. Grading

The site plan proposes mass grading over the most of the 45 acre site with exception to large south wetland area to accommodate the new lots, streets, sidewalks etc. within the development. To best preserve the south wetland a retaining wall is proposed to be constructed outside of the City right of way. The retaining wall will be designed and certified by a licensed engineer and will be required as owned and maintained by the established HOA. Further evaluation of wall designs are needed so as to minimize impacts within the public right of way with future maintenance or replacement. All stormwater ponding areas will be dedicated as outlots to be owned and maintained by the Jonathan association and the HOA with drainage and utility easements provided for City maintenance of the ponding areas. Prior to a grading permit being issued for the

development, all agency approvals for wetlands and storm water management will be required.

6. Construction Access – All construction access will be directed to use the north intersection of Autumn Woods Drive as per direction of Carver County.



**CITY OF CHASKA
CARVER COUNTY, MINNESOTA**

RESOLUTION

DATE 10/18/2021 **RESOLUTION NO.** 2021-67

MOTION BY COUNCILMEMBER _____ **SECOND BY COUNCILMEMBER** _____

**Resolution approving the Preliminary Plat and Sale of Excess City Land for Reserve
at Autumn Woods/Lennar/PC #2021-16**

WHEREAS, the 86-lot detached single-family proposal on approximately 45-acres of property is located west of County Road 15 (Audubon Road) and south of Autumn Woods Drive; and

WHEREAS, a public park totaling 3.13 acres is proposed on the northwest corner of the site; and

WHEREAS, three lot sizes/products are proposed within this development (dubbed as Lennar's 'Landmark Series' and 'Discovery Series'); the Landmark Series (66 lots) will be 65 and 75 foot wide lots; and

WHEREAS, the Discovery Series (20 lots) will be 55 foot wide lots; and

WHEREAS, the layout of the site will come from the extension of Ironwood Boulevard to the south from the Autumn Woods development; and

WHEREAS, the road will travel north-south near the easterly portion of the site to connect into Autumn Woods Drive on the north side to provide an additional access into the development (this connection will require purchasing City-owned land to access Autumn Woods Drive); and

WHEREAS, a right-out access will be provided to Audubon Road (CR 15) to the east between Autumn Woods Drive and Butternut Drive; and

WHEREAS, a loop street (Sugar Maple Drive) will extend off the west side of Ironwood Boulevard; and

WHEREAS, a traffic impact analysis (TIA) was completed for this preliminary submittal; and

WHEREAS, the traffic study evaluated the impacts of the development on the internal streets as well as looked at all major intersections of Autumn Woods; and

WHEREAS, it concluded that all intersections will operate at a serviceable level with the build-out of the development; and

WHEREAS, it also concluded that the scenario showing access onto Autumn Woods Drive and Ironwood Boulevard extending to the south would be the best traffic scenario for the development and surrounding neighborhoods; and

WHEREAS, the Autumn Woods Drive and Audubon Road intersection will be improved to include a dedicated left and right turn lane on Autumn Woods Drive; and

WHEREAS, the current preliminary plan appears to show road right-of-way widths that are consistent with the City's typical 60 foot wide ROWs as they are matching up with the stub street of Ironwood Boulevard; and

WHEREAS, one area of exception is the width of Ironwood Boulevard near the south side of the development site, and this area will taper in a couple feet (4 feet) to help promote traffic calming measures; and

WHEREAS, the incorporation of this is to promote people to slow down as they are coming south and north along Ironwood Boulevard; and

WHEREAS, construction traffic is proposed to be accessed off of Autumn Woods Drive to the north of the development; and

WHEREAS, the existing Wagner driveway access on Audubon Road (CR 15) was looked at for a temporary construction access, however, Carver County deemed this access to be unsafe; and

WHEREAS, the lots that abut the wooded steep slope edges on the north edge of the site are now shown to be out of the 30 foot no grade/no mow setback; and

WHEREAS, the 30 foot wooded steep slope no grade/no mow setback does not allow fences to be built on or within it so it's better that these setbacks are not within property lines; and

WHEREAS, a public trail already exists on the west side of County Road 15 (Audubon Road), which will be connected by the development's proposed sidewalks (one on the northeast side on the south side of Autumn Woods Drive; and one on the east side at the new right-out access); and

WHEREAS, another trail connection is shown on the northwest side of the site at the proposed public park entrance on Autumn Woods Drive, which would connect north up to Julian Drive; and

WHEREAS, this connection needs to be further discussed with Jonathan on its implementation; and

WHEREAS, another sidewalk extension is shown that connects the easterly sidewalk on Ironwood Boulevard to connect into Butternut Drive, which will ultimately connect into the proposed pedestrian crossing across the Ironwood Boulevard and Butternut Drive intersection; and

WHEREAS, the preliminary plan is showing a level of screening occurring and the applicant states that approximately 90 trees will be added to the east side of the development as it abuts Audubon Road (CR 15); and

WHEREAS, 722 trees were inventoried on the site, and the developer has already started to show certain areas for tree preservation (574 trees saved; 148 trees proposed to be removed), mainly along the south edge, and northwest edges of the site in rear yards and in the public park area; and

WHEREAS, there were trees noted in concept plan near the entrance of this park that would be beneficial in preserving (oak trees ranging from 29" to 41" in caliper that are in Excellent and Good conditions (trees 1208, 1215, 1220, and 1221), and provide a natural grand entrance to the park for the development; and

WHEREAS, the preliminary plan has been modified to provide a wider opening into the park, which now preserves those trees; and

WHEREAS, the Jonathan Association plans to take over this development once it's built out; and

WHEREAS, they will be the owners and maintainers of the tree preservation areas, trails, ponds, and other common areas; and

WHEREAS, the city will maintain the ponds consistent with the existing Autumn Woods developments; and

WHEREAS, city staff, the developer and the Jonathan Association met on Monday, October 11th and they both confirmed that the developer and the Association are close to signing an agreement to get the development signed over when Lennar is wrapped up on their end; and

WHEREAS, the preliminary plat shows the platting of 86 single-family lots, and the disposition of outlots are as follows:

- **Outlot A:** public park space to be deeded to the City of Chaska
- **Outlot B:** wooded steep slope, wetland, and ponding area to be owned by the Jonathan HOA
- **Outlot C:** trail and ponding area to be owned by the Jonathan HOA
- **Outlot D:** trail, wetland, and ponding area to be owned by the Jonathan HOA
- **Outlot E:** ponding area to be owned by the Jonathan HOA
- **Outlot F:** monument sign area to be owned by the Jonathan HOA; and

WHEREAS, the development currently does not have direct frontage on Autumn Woods Drive; there is a small sliver of City owned land that runs between the Wagner's property and Autumn Woods Drive; and

WHEREAS, this area of land is determined to be excess city land; and

WHEREAS, because of this the developer will be required to purchase a portion of the land needed for the street access; and

WHEREAS, the developer will be purchasing this sliver from the City at the same per acre charge that they bought the Wagner property for; and

WHEREAS, on October 13, 2021 the Planning Commission recommended approval to the City Council of the Preliminary Plat and Sale of Excess City Land for Reserve at Autumn Woods (PC#2021-16); and

NOW, THEREFORE, BE IT RESOLVED, by the City Council of the City of Chaska, Minnesota, hereby approves the Preliminary Plat and Sale of Excess City Land for Reserve at Autumn Woods (PC#2021-16), subject to the aforementioned stipulations and the following conditions:

1. Approvals shall be based on the following graphic exhibits:
 - a. Narrative (pgs 1-6), prepared by Josh Metzger of Lennar, undated
 - b. Title Sheet General Information (pg 1), prepared by ISG, dated July 6, 2021
 - c. Typical Street Section and Details (pg 2), prepared by ISG, dated July 6, 2021
 - d. Site Details (pgs 3-4), prepared by ISG, dated July 6, 2021
 - e. Retaining Wall – Fence Plan and Details (pg 5), prepared by ISG, dated July 6, 2021
 - f. Stormwater Basin Details (pgs 6-8), prepared by ISG, dated July 6, 2021

- g. Preliminary Plat (pg 9), prepared by ISG, dated July 6, 2021
 - h. SWPPP Narrative (pg 10), prepared by ISG, dated July 6, 2021
 - i. SWPPP Details (pgs 11-12), prepared by ISG, dated July 6, 2021
 - j. Proposed SWPPP (Overall) (pg 13), prepared by ISG, dated July 6, 2021
 - k. Proposed SWPPP (NW) (pg 14), prepared by ISG, dated July 6, 2021
 - l. Proposed SWPPP (NE) (pg 15), prepared by ISG, dated July 6, 2021
 - m. Proposed SWPPP (SW) (pg 16), prepared by ISG, dated July 6, 2021
 - n. Proposed SWPPP (SE) (pg 17), prepared by ISG, dated July 6, 2021
 - o. Existing Site & Removal Plan (pg 18), prepared by ISG, dated July 6, 2021
 - p. Overall Site Plan (pg 19), prepared by ISG, dated July 6, 2021
 - q. Autumn Woods Dr. Proposed Improvements (pg 20), prepared by ISG, dated July 6, 2021
 - r. West Property Lot Comparison Exhibit (pg 21A), prepared by ISG, dated July 6, 2021
 - s. Utility Plan (Overall) (pg 22), prepared by ISG, dated July 6, 2021
 - t. Utility Plan (NW) (pg 23), prepared by ISG, dated July 6, 2021
 - u. Utility Plan (NE) (pg 24), prepared by ISG, dated July 6, 2021
 - v. Utility Plan (SW) (pg 25), prepared by ISG, dated July 6, 2021
 - w. Utility Plan (SE) (pg 26), prepared by ISG, dated July 6, 2021
 - x. Hydrant Coverage Map (pg 27), prepared by ISG, dated July 6, 2021
 - y. Grading Plan (Overall) (pg 28), prepared by ISG, dated July 6, 2021
 - z. Grading Plan (NW) (pg 29), prepared by ISG, dated July 6, 2021
 - aa. Grading Plan (NE) (pg 30), prepared by ISG, dated July 6, 2021
 - bb. Grading Plan (SW) (pg 31), prepared by ISG, dated July 6, 2021
 - cc. Grading Plan (SE) (pg 32), prepared by ISG, dated July 6, 2021
 - dd. Wetland Buffer and Signage (pg 33), prepared by ISG, dated July 6, 2021
 - ee. Traffic Control Plan (Signage) (pg 34), prepared by ISG, dated July 6, 2021
 - ff. Emergency Vehicle Access Plan (pg 35), prepared by ISG, dated July 6, 2021
 - gg. Restoration and Planting Plan (pg 36), prepared by ISG, dated July 6, 2021
 - hh. Planting and Utility Plan (Overall) (pg 37), prepared by ISG, dated July 6, 2021
 - ii. Planting Notes and Details (pg 38), prepared by ISG, dated July 6, 2021
 - jj. Overall Tree Preservation (pg 39), prepared by ISG, dated July 6, 2021
 - kk. Tree Preservation A (pg 40), prepared by ISG, dated July 6, 2021
 - ll. Tree Preservation B (pg 41), prepared by ISG, dated July 6, 2021
 - mm. Tree Preservation C (pg 42), prepared by ISG, dated July 6, 2021
 - nn. Tree Preservation D (pg 43), prepared by ISG, dated July 6, 2021
 - oo. Tree Survey A (pg 44), prepared by ISG, dated July 6, 2021
 - pp. Tree Survey B (pg 45), prepared by ISG, dated July 6, 2021
 - qq. Tree Survey C (pg 46), prepared by ISG, dated July 6, 2021
 - rr. Traffic Impact Analysis – Draft, prepared by ISG, dated September 3, 2021
2. Adherence with the City Engineer's Memo dated October 6, 2021.
 3. Adherence with the Carver County Public Works memo dated May 7, 2021.
 4. Provision that all lot lines are outside 30 foot no grade/no mow setback of wooded steep slopes.
 5. Preservation of the wooded steep slopes, including 30-foot buffer and a 50-foot setback from that wooded steep slope.
 6. Provision that all lot lines are outside of wetland areas and their required buffers.
 7. Adherence to the City's Boulevard Tree Policy and local street section design.
 8. Provision that boulevard trees are placed between the sidewalk and street.
 9. Provision of adequate berming and landscaping along east edge abutting County Road 15 consistent with the preliminary landscape plan.
 10. Provision of sidewalks on both sides of all local streets.
 11. Adherence to the following building setbacks:
 - a. Front (house): 25 feet
 - b. Rear: 25 feet
 - c. Side (Landmark Series and Discovery Series): 7.5 feet
 - d. Side (corner): 20 feet
 12. Adherence to the 125 foot centerline building setback from County Road 15.

13. Prior to final plat approval, developer shall enter into an agreement with the City for the provision of necessary infrastructure and associated development costs.
14. Compliance with the City's anti-monotony and design requirements zoning ordinance (Section 9.28).
15. Provision of LP Smartside used on all front elevations, and 4 inch window trim on all windows.
16. Provision of developer responsibility to remove any hazardous trees or limbs on site as determined by the Public Works Director, prior to issuance of a building permit.
17. Provision of a storm water management plan meeting City and Riley Purgatory BCWD standards.
18. Provision that adequate maintenance accesses are provided for the stormwater ponds.
19. Provision of an approved construction traffic plan by Carver County to be submitted at final submittal.
20. Direct right-out access onto County Road 15 (Audubon Road) shall be shown on the plans and receive approval by Carver County prior to recording of the final plat.
21. Right-out access to accommodate life safety for emergency service and to be coordinated with Engineering and City fire department.
22. Provision to include the Reserve at Autumn Woods development into the Jonathan Association.
23. Provision that the remaining park dedication requirements be provided in cash.
24. Provision that the monument sign adhere to zoning Section 10 sign regulations, and a sign permit obtained prior to installation.
25. Provision of a construction traffic plan including routes and signage to be submitted at final submittal.
26. Installation of turn lanes on Autumn Woods drive to be completed prior to issuance of first Certificate of Occupancy in Reserve at Autumn Woods, and with final ware-course on turn lane improvements to be installed after full construction of development.
27. Installation of berming on east side of Reserve at Autumn Woods to be completed prior to issuance of first Certificate of Occupancy.
28. Provision of adequate screening applied on the south edge of the site between Ironwood Boulevard and Audubon Road, and to show on the landscape plan for final submittal.

Passed and adopted by the City Council of the City of Chaska, Minnesota, this 18th day of October, 2021.

Mark Windschitl, Mayor

Attest: _____
Chaska Deputy Clerk



**Carver County
Public Works**

11360 Highway 212, Suite 1
Cologne, MN 55322

May 7, 2021

*(Review comments from October 2021 preliminary plat submittal are made in blue italic font.
Comments updated **October 13, 2021**)*

City of Chaska
c/o Elizabeth Hanson, AICP
City Planner
952-448-9200
EHanson@chaskamn.com

Re: Development / Access Review Comments: Wagner Woods Concept Plan - *Reserve at Autumn Woods Preliminary Plat* - located at PID# 300270100 adjacent to County State Aid Highway (CSAH) 15 (Audubon Road)

Thank you for the opportunity to review the subject development in the City of Chaska. Consistent with the County Comprehensive Plan and County Codes, and other official controls of the County, the following are comments and recommended conditions of approval and as potential requirements for any necessary permits to be issued for the project.

1. Regarding access onto the County Highway –
 - a. A Transportation Impact Analysis (TIA) is required based on the number of proposed units and potential traffic impacts to County intersections of CSAH 15/Autumn Woods Dr. and CSAH 15/Butternut Dr. The TIA will need to evaluate the operations at the CSAH 15/Autumn Woods Dr. intersection and the CSAH 15/Butternut Dr. intersection. See the attachment titled Appendix A: Traffic Impact Analysis Process for requirements. Based on TIA findings, County may impose reasonable conditions to mitigate development driven traffic impacts at these intersections.
 - i. Condition applies/Comment resolved. A TIA for Reserve at Autumn Woods was completed and submitted for County review. See County review memo titled 'Development/Access Review Comments: Reserve at Autumn Woods Traffic Impact Analysis' regarding comments on the TIA.*
 - ii. TIA finding/New comment. A dedicated left-turn lane is recommended on the western leg of the CSAH 15/Butternut intersection. Preferred configuration for this leg of the intersection is for a dedicated left turn lane and a dedicated right turn lane although a dedicated left turn lane with a combined through-right lane for this leg of the intersection is also acceptable.*
 - b. No direct access to CSAH 15 is proposed. Additional County review and approval will be required if this condition changes.
 - i. Proposal changed/New condition. Proposed access in the preliminary plat has changed to include a right-out onto CSAH 15 from the development at/near the existing driveway location.*

CARVER COUNTY

1. *The County's Access Spacing Map in the 2040 Comprehensive Plan (Figure 4.14) identifies this segment of CSAH 15 as Category 5B, which guides full access intersection spacing at ¼ mile intervals and secondary (limited) intersection spacing at 1/8 mile intervals. The distance to the proposed access meets the spacing guidance for secondary (limited) access consideration: approximately 0.15 miles from the CSAH 15/Butternut Dr. intersection and approximately 0.15 miles from the CSAH 15/Autumn Woods Dr. intersection.*
 2. *County access permit approval will require roadway improvements to CSAH 15 to accommodate this access including but not limited to:*
 - a. *Installation of a center median on CSAH 15 for a minimum length of 300 ft. on both sides of the access with 1:15 tapers.*
 - b. *Right out access shall be designed to accommodate school buses and fire trucks.*
 - c. *The configuration of CSAH 15 needs to maintain 12 ft. travel lanes, 2 ft. curb reaction to the median curb face, and 8 ft. shoulders to curb face from the through lane.*
2. Regarding highway right of way –
- a. CSAH 15 at this location is a 2-lane undivided urban roadway facility with a trail on the west side. The existing right of way is approximately 50 ft. from the centerline of the roadway adjacent to the subject property.
 - i. *Information.*
 - b. The planned typical section for the segment of highway along this property is a 2-lane undivided urban facility with a trail on the west side. The County's 2040 Comprehensive Plan (Figure B.6) defines the needed right of way for this type of highway typical section as 60 ft. from centerline.
 - i. *Information.*
 - c. The plat shall incorporate 60 ft. of dedicated right of way from the centerline of CSAH 15 to the subject property.
 - i. *Proposal changed/New condition. The proposed right-out access will require installation of a center median on CSAH 15 (Condition 1.b.i.2.a). The new roadway section will be a 2-lane urban divided section with trail, which requires 65 ft. of right of way dedication from centerline per 2040 Comprehensive Plan referenced above. Right of way dedication along CSAH 15, shall incorporate an additional 5 ft. to meet the guidance for 65 ft. from centerline for a 2-lane divided urban highway with trail.*
3. Noise mitigation along CSAH 15 is recommended via increased setback, berm, and/or other screening of planned dwellings adjacent to CSAH 15.
 - i. *Information. Comment resolved via incorporation of City requirements.*
4. The County will need to review and approve the final grading plans for properties adjacent to CSAH 15. A grading permit will be required for grading work within the highway right of way.
 - i. *Condition applies. Additional review and coordination needed for permit*

approval.

5. The technical details of the final plat, its boundaries and form(s) will need to be reviewed and approved by the County Surveyor.

i. Condition applies for final approval.

6. Prior to any work affecting or on County highways or in County right of way, the applicant shall coordinate plans with the County Engineer and obtain a Utility or Excavating/Filling/Grading Permit(s) from Carver County Public Works: (www.co.carver.mn.us/departments/public-works/quick-links/permits). Final details of locations, grades, and profiles affecting County roads as well as any utility connections will need to be reviewed and approved prior to any permits.

i. Condition applies. Additional review and coordination needed for permit approval.

7. Any damages, modifications, or changes incurred on County highways from current or approved conditions will need to be remedied or updated at development expense, including costs incurred by the County.

i. Information.

These are the County's comments at this time. If you have any questions or need further assistance, please contact staff noted below:

Joan Guthmiller Administrative Technician Carver County Public Works 952.466.5201 jguthmiller@co.carver.mn.us	Angie Stenson AICP Sr. Transportation Planner Carver County Public Works 952.466.5273 astenson@co.carver.mn.us	Dan McCormick, P.E. PTOE Traffic Services Supervisor Carver County Public Works 952.466.5208 dmccormick@co.carver.mn.us
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NARRATIVE: Reserve at Autumn Woods Single Family Residential Community

U.S. Home Corp, dba Lennar, is pleased to submit this request for Rezoning and Preliminary Plat of Reserve at Autumn Woods, a proposed single family community at Audubon Road and Autumn Woods Drive.

Lennar Core Values and Guiding Principles

Our devotion to Quality, Value, and Integrity is the underlying foundation upon which Lennar was built. These three fundamental principles still guide us in caring for our clients, associates, shareholders, and community.

- **Quality**: Lennar continually maximizes the quality of its building efforts. Not only do we harness our national purchasing power to increase quality building materials while lowering costs to deliver greater value, but we observe internal quality assurance programs and external third-party inspection processes to guarantee the quality of every new home.
- **Value**: Lennar delivers unprecedented value through its industry-leading incentives. Our Everything's Included® approach gives buyers the new home features and finishes they want at the best possible value, while a personal myLennar account simplifies the homeownership experience with easy-to-access tools, resources, and rewards. Also, our family of companies can assist with mortgage, title, and insurance needs to ensure a smooth closing.
- **Integrity**: At Lennar, we are committed to doing the right thing for the right reason. We are dedicated to being an innovator in the industry, constantly focused on improving the quality of our homes and approaching each day with the highest level of integrity for our customers, associates, shareholders, trade partners, community, and environment.

Existing Conditions

(please see Existing Conditions exhibit)

The subject property is located at 9430 Audubon Road on the eastern edge of Chaska and is bounded by Autumn Woods Drive on the north, The Autumn Woods and Autumn Woods East residential developments to the west and south, and by Audubon Road on the east. The site is 45.47 gross acres in size and is currently farmed agricultural land with wooded areas on the southwest and northwest edges. Five wetlands have been delineated on the site totaling approximately 5 acres in size. There are steep slopes surrounding the wetland on the north edge of the property, as well as a small steep slope area on the southern edge of the property.

Development Overview

- **Homes**: The proposed community will consist of 86 single family homes (approximately 2.17 units/acre) of varying styles. Infrastructure: The neighborhood will be served by public street and utilities.
- **Wetlands & Ponding**: Of the roughly 5 acres of existing wetlands on the property approximately 1.2 acre will be fully impacted and replaced with the purchase of credits, and the remaining 3.8 acres will remain undisturbed. Stormwater ponds will be created on site for purposes of stormwater treatment. The wetlands and stormwater ponds will be platted in outlots which will be owned by the HOA with easements granted to the City for maintenance of the ponds.
- **Landscaping**: Trees will be planted along Audubon Road to provide a landscape buffer for the homes backing up to Audubon. Boulevard and yard plantings will also be installed per City Code requirements.
- **Park Dedication**: Lennar is proposing the dedication of 3.13 acres of upland for use as parkland.
- **Parking**: The community will be served by public streets with a curb-to-curb width of 32 feet. These homes will contain 2-car, 3-car, or 4-car garages which will be served by a minimum 25-foot long driveway. This means each lot could park a minimum of four cars.

- Developer/Builder: Lennar will act as both developer of the property and builder of the homes.
- HOA – Jonathan Association: Lennar and the Jonathan Association intend to make the Reserve at Autumn Woods community a part of the Jonathan Association. The Lennar and Jonathan teams had a meeting in mid-September to discuss the process for annexing Reserve at Autumn Woods into the Jonathan Association and the documentation necessary to get that process started. Draft documents will be in the works over the coming weeks.

Proposed Homes and Architecture

(please see exterior renderings, photos, and floorplans)

The Landmark Series are one-story and two-story single family homes with 3-car or 4-car garages. Landmark homes will be placed on 65-foot and 75-foot wide lots. The Discovery Series are one-story and two-story single family homes with 2-car garages. Discovery homes will be placed on the 55-foot wide lots.

Landmark Series

<u>Units</u> :	66 lots
<u>Lot Width</u> :	52 lots @ 65 ft; 14 lots @ 75 ft
<u>Building Width</u> :	50 or 60 feet
<u>Bedrooms</u> :	4 to 5 bedrooms
<u>Bathrooms</u> :	3 to 5 bathrooms
<u>Garage</u> :	3-car or 4-car
<u>Square Footage</u> :	1,920 - 2,790
<u>Base Price Range</u> :	**\$500,000 - \$600,000
<u>Setbacks</u> :	Front – 25 feet Side – 7.5 feet Corner – 20 feet Rear – 25 feet

Discovery Series

<u>Total Units</u> :	20 lots
<u>Lot Width</u> :	55 feet
<u>Building Width</u> :	40 feet
<u>Bedrooms</u> :	4 to 5 bedrooms
<u>Bathrooms</u> :	3 to 4 bathrooms
<u>Garage</u> :	2-car
<u>Square Footage</u> :	2,440 – 2,690
<u>Base Price Range</u> :	**\$450,000 - \$500,000
<u>Setbacks</u> :	Front – 25 feet Side – 7.5 feet Corner – 20 feet Rear – 25 feet

***Pricing is estimated and subject to change based on current market conditions at time of sales.*

Lennar homes include varying amounts of stone on front facades and siding materials consist of lap siding, shakes, or board and batten. Other architectural features available on selected facades include columns, gables, shutters, accentuated window trim and fascia, and decorative roof brackets and cornices. Architectural renderings are included with this submittal. Lennar's design team will carefully plan the color packages of each home to avoid monotony and to ensure a visually appealing streetscape.

Infrastructure

The proposed community is located adjacent to existing residential development. As a result, all infrastructure is readily available and adequately sized to handle additional development. No trunk infrastructure will need to be constructed to serve this development. Watermain, sanitary sewer, and storm sewer are available in Autumn Woods Drive or Ironwood Boulevard.

Stormwater will be collected by storm sewer and discharged into the City storm sewer system, wetland or stormwater pond for treatment. An existing culvert carries a small portion of stormwater from the site to an existing wetland on the east side of Audubon Road. The development's stormwater system will be designed to meet City and County standards.

Access for the new neighborhood will be provided from a new connection made at Autumn Woods Drive to the north, the extension of Ironwood Boulevard to the south, and a right-out onto Audubon Road midway between Autumn Woods Drive and Butternut Drive. As mentioned previously, the new community will be served by public street and utilities.

Public Park and Trails

The City's Comprehensive Plan calls for the placement of a park on this property. Lennar is proposing the dedication of 3.13 acres of upland for use as parkland. This area is located on the northwest edge of the property adjacent to 3.64 acres of vacant land owned by the City. Therefore, there is potential for the creation of a public park larger than 3.13 acres which would be accessible from Autumn Woods Drive. The park will also be accessible from the Reserve at Autumn Woods community with 155 feet of frontage on Sugar Maple Drive.

A system of trails will run through the neighborhood connecting the proposed City park to the neighborhood park at Ironwood and Butternut. Regional trail systems can be immediately accessed via the Audubon Road trails. The neighborhood will also be served by sidewalks located on both sides of the street. The varying tiers of single family homes proposed for this community will attract a wide range of demographics, including first-time home buyers, young to middle-aged singles, small families, divorcees, and empty nesters. The new public park and access to regional trails will cater towards all these demographics.

Tree Preservation and Planting

Significant slopes were present on the hillsides around the wetland located along the northern boundary of the site. Due to a combination of the slippery and unsafe conditions at the time of field work, and the fact that this area will not be impacted by future development, the majority of trees located below the top of the steep slope were not inventoried. Of what could safely be completed, a total of 722 significant trees were inventoried and tagged within the project boundary. Detailed assessments of each tree's structural and health conditions were reported based on visual inspections from the ground and were given a rating of Excellent, Good, Fair, Poor, and Dead. The tree assessment and survey maps have been provided to the City.

Given the long-term use of the property has been agricultural much of the site is void of trees. The majority of trees that do exist on the site are clustered in the northwest and southwest corners. As with most new residential developments Lennar is proposing the removal of some trees from the site. It is estimated 148 trees will need to be removed to accommodate development of the proposed community. This means approximately 574 trees, nearly 80% of the 722 inventoried trees, will be preserved through the dedication of parkland on the north edge of the property, dedication of a tree preservation easement on the west edge, and the dedication of open space to be owned by the HOA on the southwest edge of the property. Furthermore, as mentioned above, there are hundreds of trees located on the steep slope surrounding the northerly wetland that were not inventoried but will also be preserved.

In addition to tree preservation efforts Lennar will be planting at least two trees on each residential lot, as well as additional boulevard tree plantings throughout the neighborhood. A landscape buffer consisting of approximately 90 trees will be planted on the eastern property line adjacent to Audubon Road.

Traffic Impact Analysis (TIA)

Please refer to attached TIA Summary. You may also refer to the full Traffic Impact Analysis report dated September 7, 2021 for full details.

Viewsheds

- Views from Audubon Road: The plan is to create a landscape buffer along Audubon Road so the public streetscape view will mostly be that of trees, shrubs, and grasses. Due to the mostly curvilinear design of the internal streets of this community many of the homes will be offset or angled from one another which creates visual variation and interest from the public view. Lennar's anti-monotony code will offer additional variation through the use of multiple exterior elevations and color package options so each building will be unique from the next.

- Views from homes: Many of the proposed homes (over 50%) will back up to wetlands, ponds, preserved wooded areas, or the City park, all of which should make for pleasing views from the rear yard. The 20 homes that back up to Audubon will have a densely planted landscape buffer at the rear property line which will serve as a visual and noise buffer from Audubon Road.

Disposition of Outlots

OUTLOT	FUNCTION	OWNERSHIP	HOA MAINTENANCE RESPONSIBILITY	CITY MAINTENANCE RESPONSIBILITY
Outlot A	City Park	City	None	Park Facilities
Outlot B	Wetland, Steep Slope, Infiltration Basin, Open Space	HOA	None	Infiltration Basin
Outlot C	Infiltration Basin, Trail, Open Space	HOA	Trail	Infiltration Basin
Outlot D	Tree Preservation, Wetland, Infiltration Basins, Storm Pond, Trail, Open Space	HOA	Trail	Infiltration Basin, Storm Pond
Outlot E	Infiltration Basin, Landscape Buffer	HOA	Landscape Buffer	Infiltration Basin
Outlot F	Monument Sign, Landscape Buffer	HOA	Monument Sign, Landscape Buffer	None

Description of Requests

Lennar is requesting a rezoning of the subject property from O-Open Development to PRD-Planned Residence Development which will provide flexibility and creativity in the homesite configuration which will result in an efficient use of land through the preservation of trees, wetlands and land for park dedication. The PRD zoning will also match that of surrounding neighborhoods.

The Chaska Comprehensive Plan guides the subject property Low Density Residential and Park. Therefore, our proposed plan is in conformance with the Chaska Comprehensive Plan.

Land uses surrounding the subject property include:

- North – single family homes (Autumn Woods), townhomes (Lake Hazeltine Woods);
- West – single family homes (Autumn Woods);
- South – single family homes (Autumn Woods East);
- East – Audubon Road and townhomes (Liberty on Bluff Creek).

Connectivity to Area Resources and Amenities

The subject property's proximity to the following area resources and amenities are a major part of what we believe will make this a quality and successful community:

- Downtown Chaska;
- Chaska Town Course and Hazeltine National Golf Club;
- Minnesota Landscape Arboretum;
- Eastern Carver County Schools;
- New City park and access to Chaska's vast recreational trail network;
- Wide variety of retail and dining establishments.

Comparison of original Sketch Plan to current Preliminary Plat

Below is a table comparing some of the differences between the April 2021 Sketch Plan and the September 2021 Preliminary Plat:

	Original Sketch Plan	Current Preliminary Plat
Lot Count	27 lots @ 50-feet wide	20 lots @ 55-feet wide
	75 lots @ 65-feet wide	52 lots @ 65-feet wide
		14 lots @ 75-feet wide
	102 total lots	86 total lots
Density	2.57 units/acre	2.17 units/acre
Side Setbacks Proposed	5 feet on 50-foot lots; 7.5 feet on 65-foot lots	7.5 feet on all lots
Park Size	2.64 acres	3.13 acres
Sidewalks	10,195 linear feet	8,142 linear feet
Trails	1,473 linear feet	3,187 linear feet
Open Space	13.97 acres (30.72% of site)	18.07 acre (39.74% of site)
Lots abutting West Property Line	12 lots	7 lots; (3 of these lots have been widened to 75 feet at front, 108 feet or greater at rear); (the 4 65-foot lots will have a preserved tree buffer at the west property line)
Lots abutting South Property Line	10 lots	0 lots

Chaska Core Strategies

The following summarizes how this proposed community contributes to and supports the City's core strategies.

➤ Chaska's High Quality of Life is Enhanced

This community will offer existing Chaska residents, as well as various demographics of prospective buyers looking to live in Chaska, the opportunity to purchase a new home within the City. This neighborhood will provide homeowners access to retail, dining, golf courses, medical facilities, regional transportation, quality schools, parks and trails, and proximity to downtown Chaska. This community will also include a new City park.

➤ Taxpayers Perceive they are Getting Cost-Effective Service

As an infill development, all infrastructure is in place to serve the new homes. The City will receive a significant amount of infrastructure impact fees of which little will be expended with this development. In addition, the new homes will generate tax revenue, a significant increase from the current agricultural status of the property. This will aid the City in providing cost-effective services to Chaska residents.

➤ Well-Planned and Orderly Community Development is a Priority

Development of this infill site is highly efficient and desirable from an infrastructure and orderly growth standpoint. It makes efficient use of the significant amount of public infrastructure immediately accessible in public right-of-way. The proposed community with park dedication is consistent with the Low Density Residential and Park land use designations. And as mentioned, Lennar homes contain quality materials including stone, vinyl, and LP in varying styles such as lap siding, shakes, and board and batten. Lennar's anti-monotony code will offer additional variation through the use of multiple color packages.

➤ A Sense of Community and Small Town Values are Maintained

Adding new residents to this location is ideal from the standpoint of the broader community. These new residents will strengthen and add vibrancy to the nearby restaurants, retail establishments, schools, and City parks and trail system. Downtown businesses are also likely to benefit from the addition of this community.

➤ A Commitment to Excellence

Excellence in this community will be evident in many ways:

- The plan considers tree preservation and wetlands, parkland and trails dedication, and landscape buffering.
- Views of the neighborhood from the surrounding streets and within the neighborhood.
- Attractiveness of the homes and quality of home construction.

Schedule

Land development work (grading, utilities, and streets) will hopefully begin in Fall 2021 with construction on model homes beginning late 2021 or early 2022. Ideally, we would have a model home ready for the Spring 2022 Parade of Homes. A request was made to the County to allow a construction entrance at the existing driveway access to Audubon but due to traffic and safety concerns the County will require construction traffic to enter the site from the north via Autumn Woods Drive. The overall project will likely be developed in two to three phases. Lennar estimates full occupancy of the community will occur approximately 36 months from the date sales begin.

Lennar has a long-standing history of building successful communities throughout the Twin Cities, including similar communities under development at Laketown (Victoria), Oak Tree (Carver), Ridge Creek (Shakopee), and Stonebridge (Jordan). We invite you to visit any of these communities and our website at <https://www.lennar.com/new-homes/minnesota/minneapolis-st-paul>. We are looking forward to this opportunity to work with the City of Chaska again and thank the City for its support.

Regards,

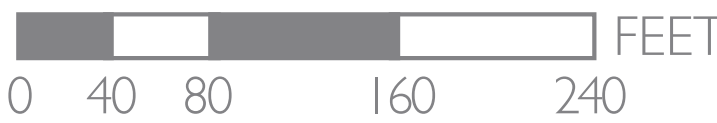
Josh Metzer
Land Entitlement Manager
Lennar Minnesota



LEGEND

- 1 PROPOSED HOUSING
- 2 LOW MAINTENANCE TURF
- 3 SALT TOLERANT SOD
- 4 MESIC PRAIRIE GENERAL
- 5 STORM WATER SEED MIX / INFILTRATION BASIN
- 6 PROPOSED CODE MINIMUM TREES
- 7 PROPOSED BUFFER
- 8 PROPOSED PARK AREA
- 9 TREE PRESERVATION AREA
- 10 STORMWATER BASIN
- 11 EXISTING WETLAND
- 12 PROPOSED GRADING CONTOURS
- 13 EXISTING WETLAND AREA
- 14 STEEP SLOPE AREA
- 15 TREE PRESERVATION AREA

OVERALL CONCEPT EXHIBIT





ISG PROJECT # 21-24984



THIS PROJECT'S TOPOGRAPHIC SURVEY CONSISTS
OF DATA COLLECTED IN MARCH - APRIL 2021 BY
ISG, INC.

1	TITLE SHEET GENERAL INFORMATION
2	TYPICAL STREET SECTION AND DETAILS
3-5	SITE DETAILS
6-8	STORM WATER BASIN DETAILS
9	PRELIMINARY PLAT (OVERALL)
10-17	SWPPP
18	EXISTING SITE AND REMOVAL PLAN
19	OVERALL SITE PLAN
20	AUTUMN WOODS DR. IMPROVEMENTS
21	RIGHT OUT TO AUDUBON
21A	WEST PROPERTY LOT COMPARISON EXHIBIT
22-26	UTILITY PLANS
27	HYDRANT COVERAGE MAP
28-32	GRADING PLANS
33	WETLAND BUFFER AND SIGNAGE
34	TRAFFIC CONTROL PLAN
35	EMERGENCY VEHICLE ACCESS PLAN
36-39	LANDSCAPE PLANS
40-43	TREE PRESERVATION PLANS
44-46	TREE SURVEY PLANS
THIS PLAN SET CONTAINS 47 TOTAL SHEETS	

NOTE:
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UPON COLOR COPIES. IF THIS TEXT DOES
NOT APPEAR IN COLOR, THIS IS NOT AN
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I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

JEREMY D. FOSS

DATE _____ LIC. NO. 55871

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PROJECT

CHASKA MINNESOTA

REVISION SCHEDULE

[illegible]

PROJECT NO.	21-24984
-------------	----------

FILE NAME	24984 TITLE
-----------	-------------

DRAWN BY JRS

DESIGNED BY	JRS
-------------	-----

REVIEWED BY JDF

ORIGINAL ISSUE DATE 07/06/21

TITLE

TITLE SHEET

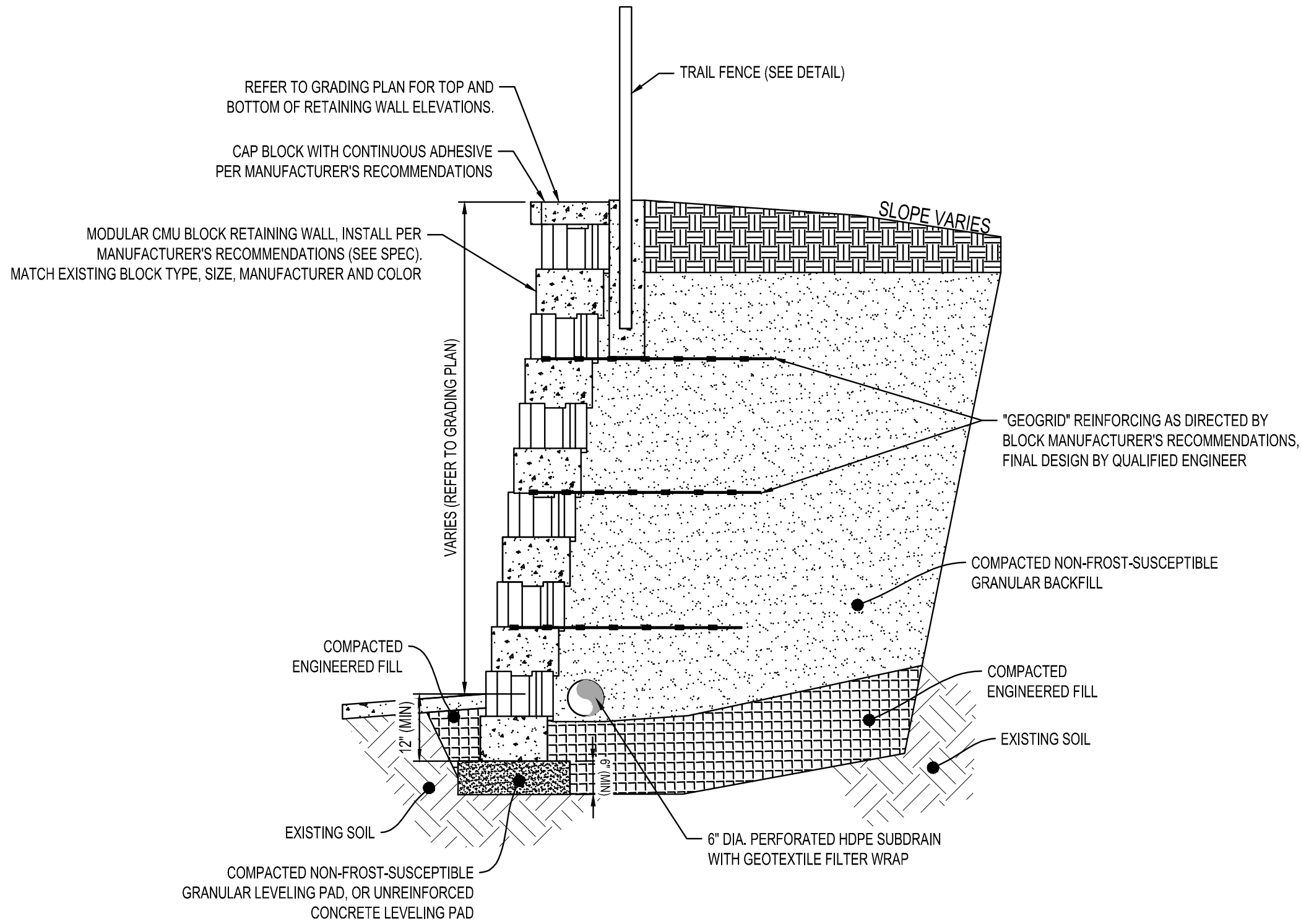
GENERAL INFORMATION

SHEET

1

OF 47

PLT DATE: 9/30/2021 12:39 PM



CONSTRUCTION NOTES:

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B. SUBMITTALS:

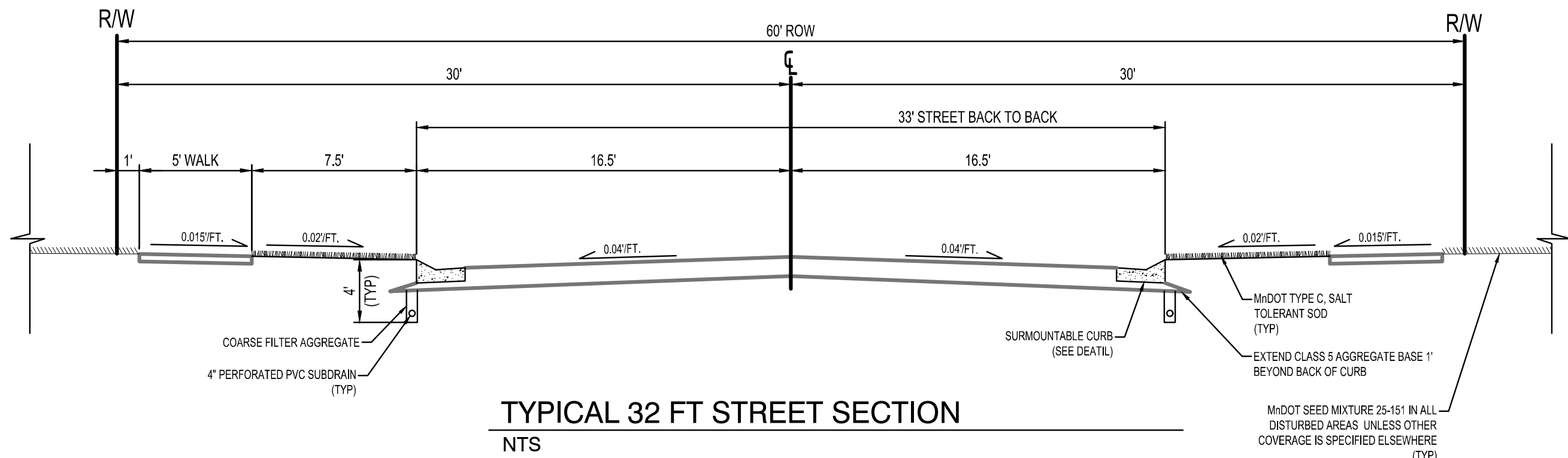
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 - CONCRETE MIX DESIGNS
 - MODULAR CONCRETE RETAINING WALL
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- A COPY OF ALL SHOP DRAWINGS SHALL BE MAINTAINED ON SITE AT ALL TIMES.

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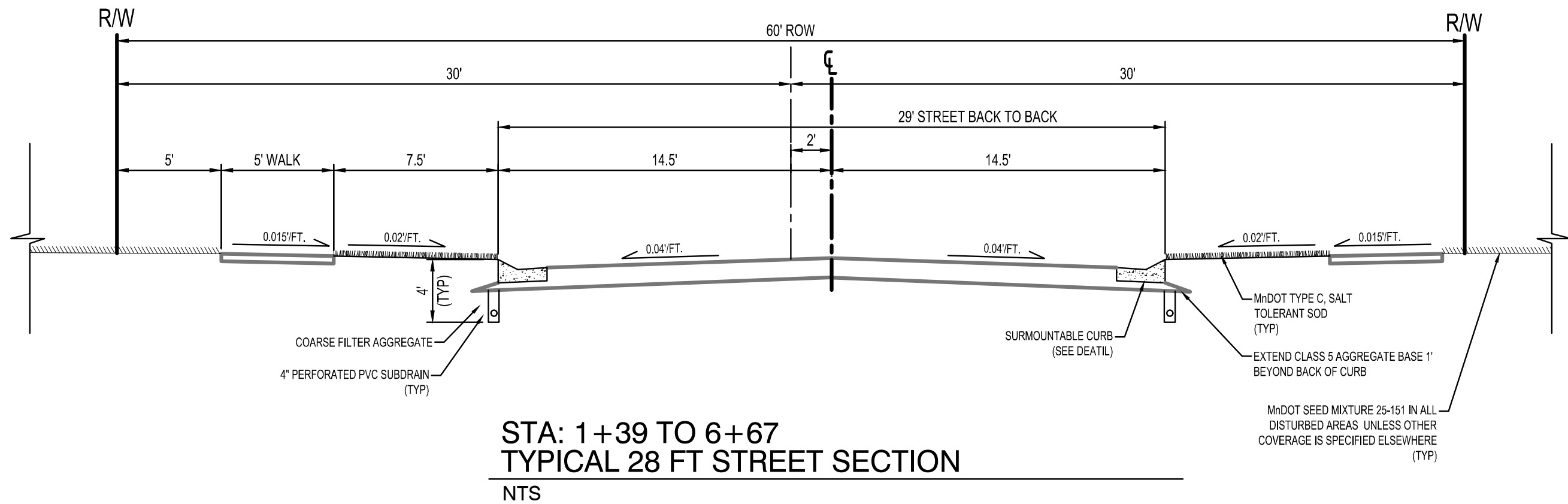
MODULAR BLOCK RETAINING WALL DETAIL

NTS



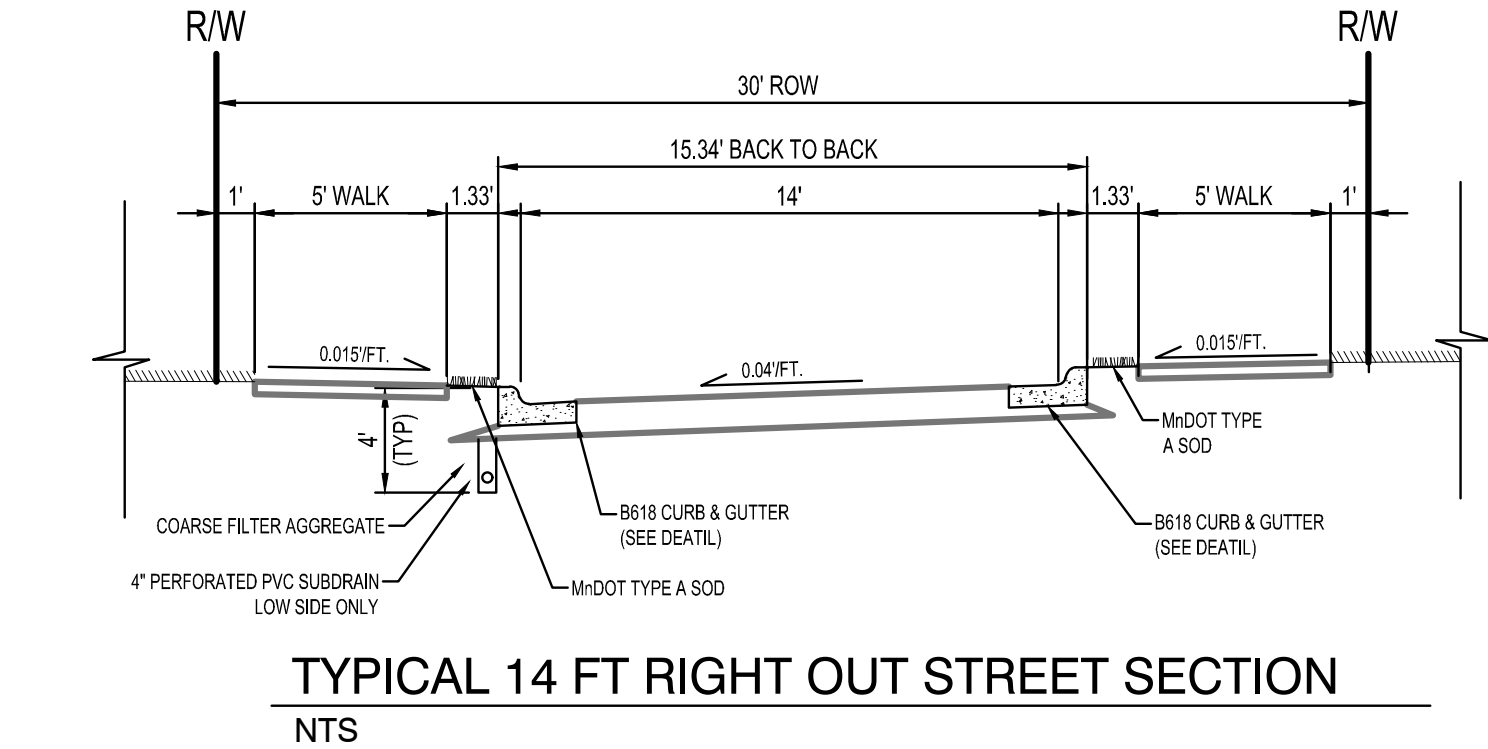
TYPICAL 32 FT STREET SECTION

NTS



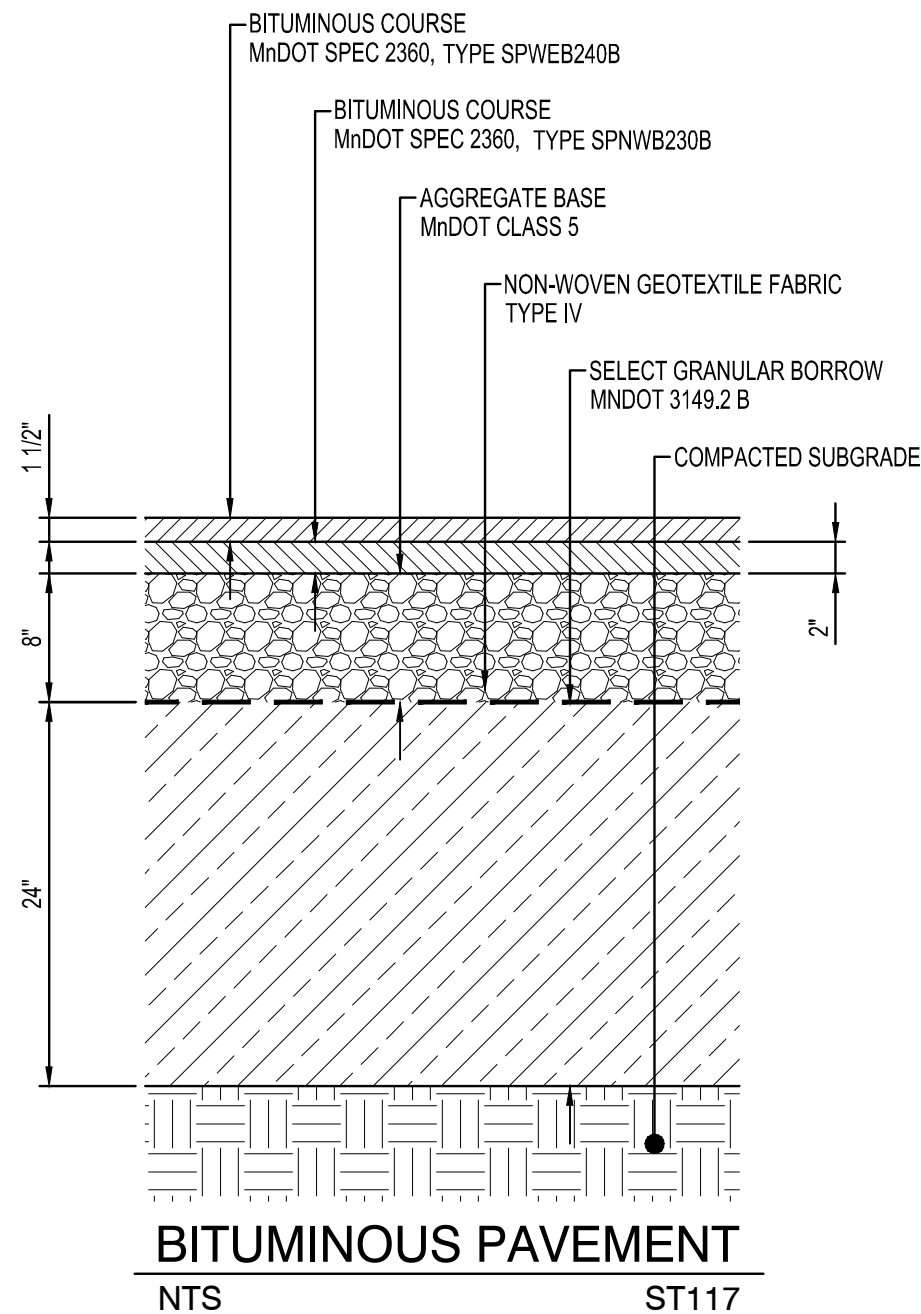
STA: 1+39 TO 6+67
TYPICAL 28 FT STREET SECTION

NTS



TYPICAL 14 FT RIGHT OUT STREET SECTION

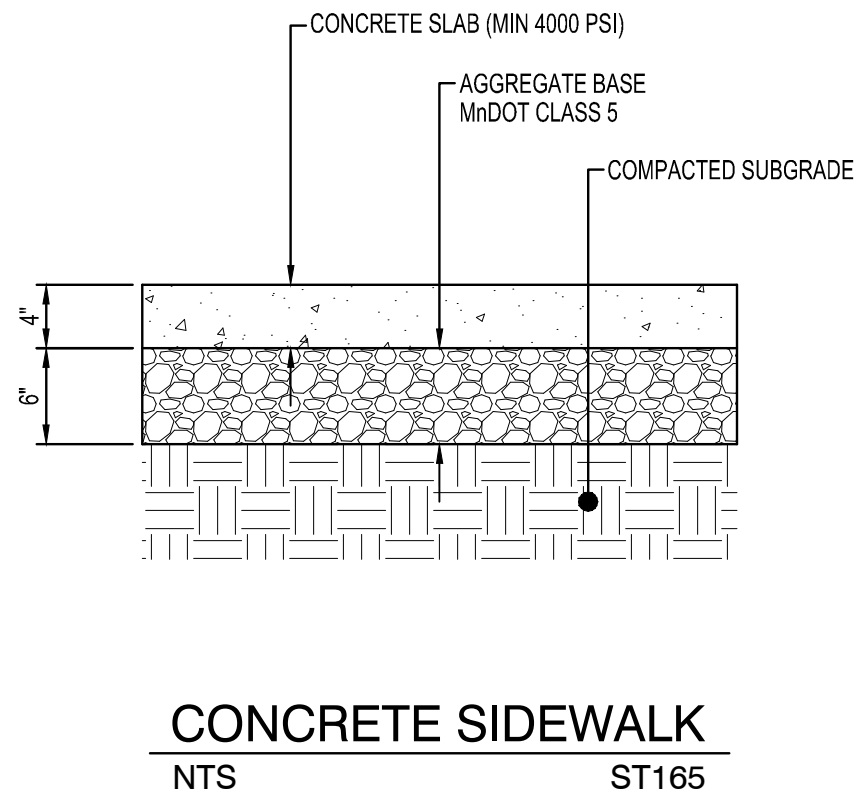
NTS



BITUMINOUS PAVEMENT

NTS

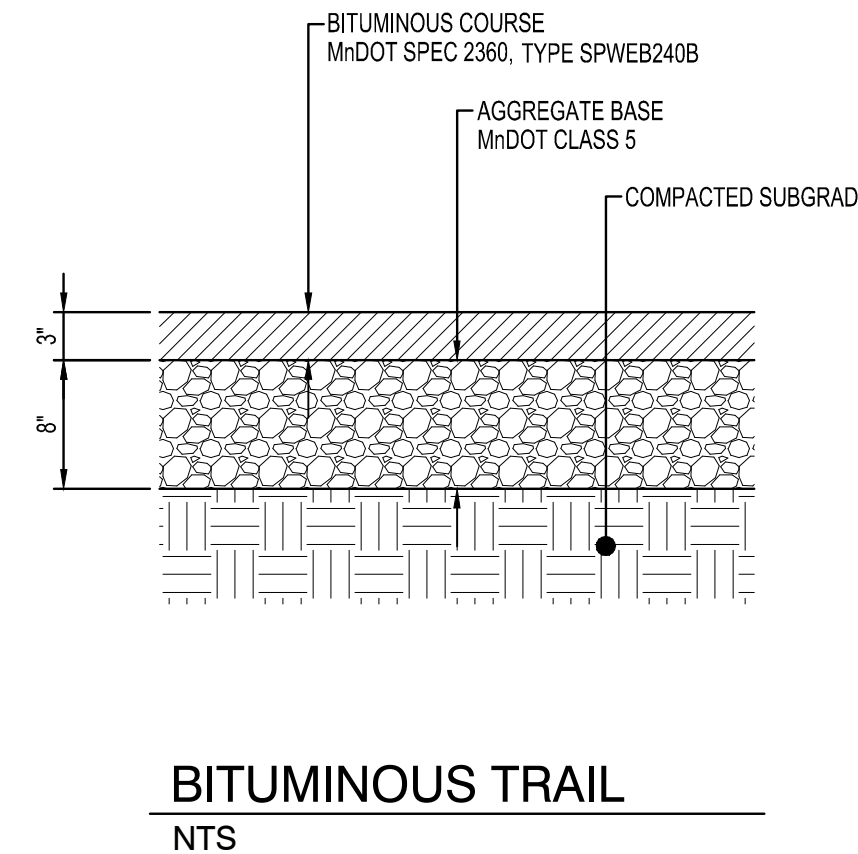
ST117



CONCRETE SIDEWALK

NTS

ST165



BITUMINOUS TRAIL

NTS



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JERREMY D. FOSS

DATE: LIC. NO. 55871

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PROJECT

LENNAR

RESERVE AT
AUTUMN WOODS

CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	21-24984
FILE NAME	24984 DETAILS
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

TITLE
**TYPICAL STREET
SECTION AND
DETAILS**

SHEET

2



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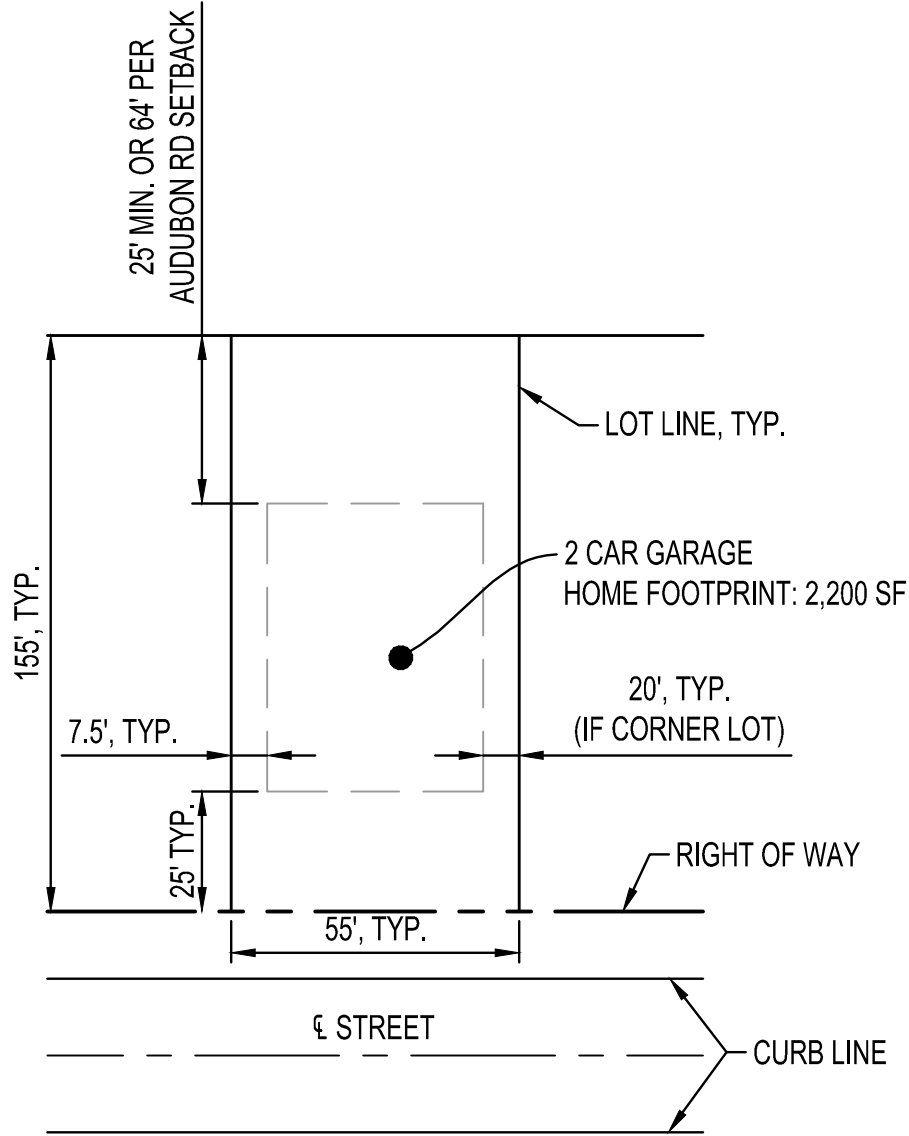
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SITE DETAILS

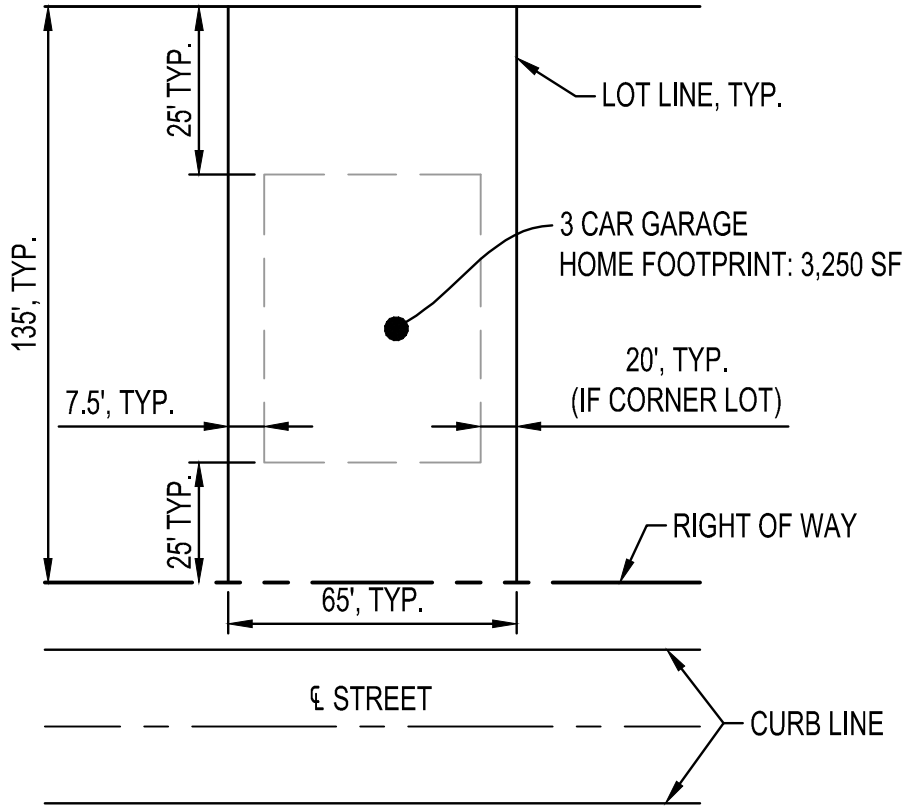
SHEET

3

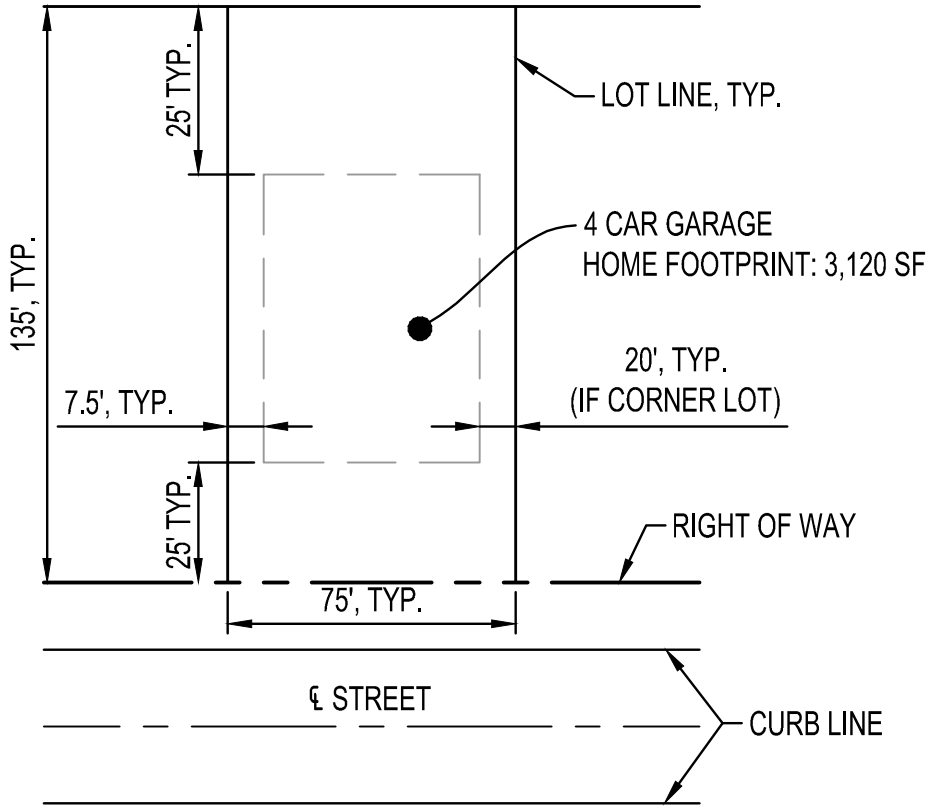
OF 47



55' SINGLE FAMILY
TYPICAL LOT LAYOUT
NTS



65' SINGLE FAMILY
TYPICAL LOT LAYOUT
NTS



75' SINGLE FAMILY
TYPICAL LOT LAYOUT
NTS



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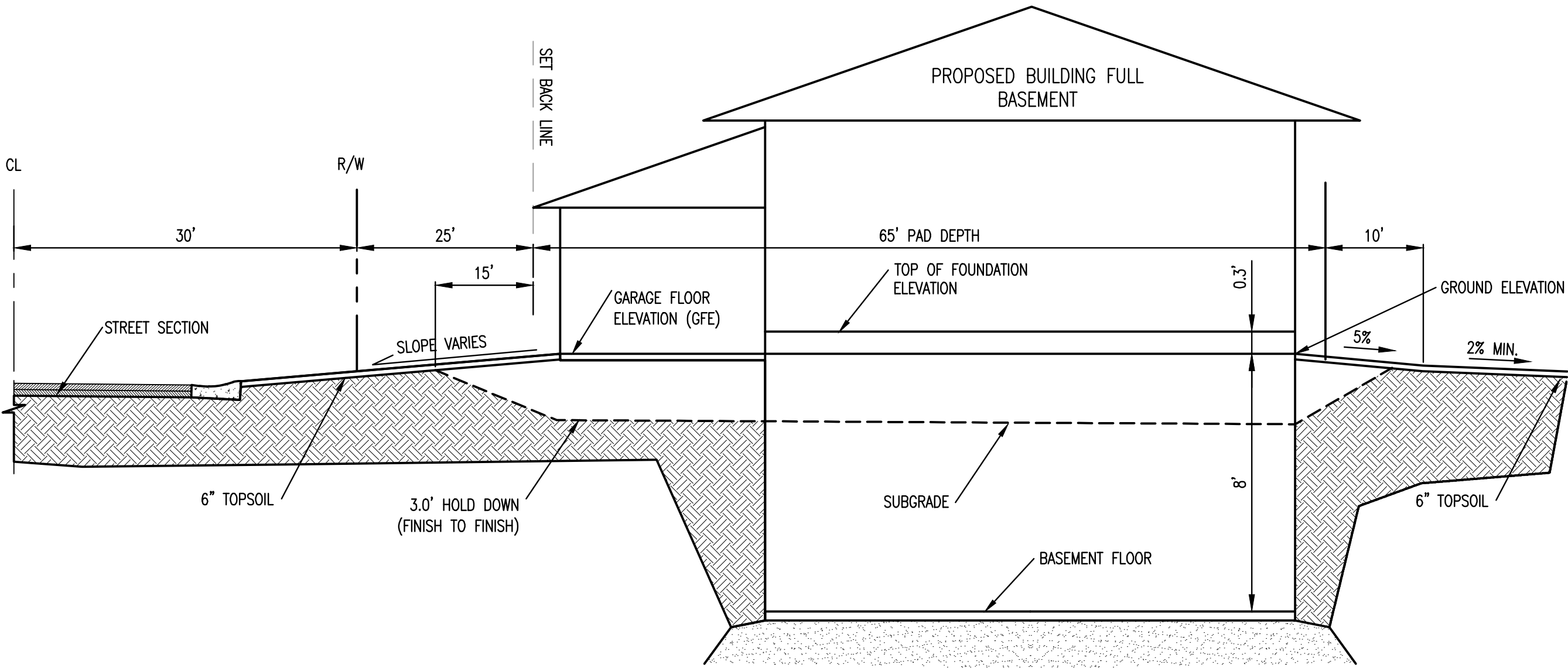
SITE DETAILS

SHEET

4

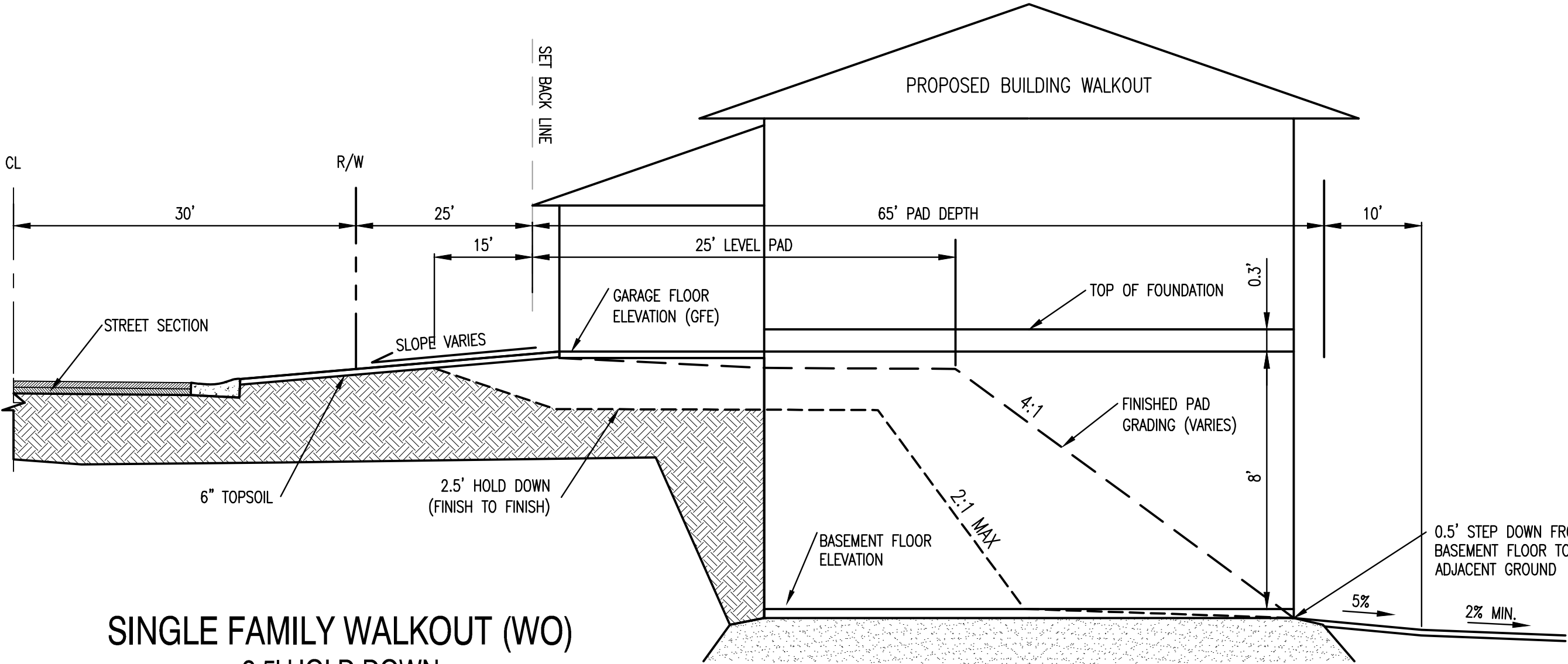
OF 47

PRELIMINARY NOT FOR CONSTRUCTION



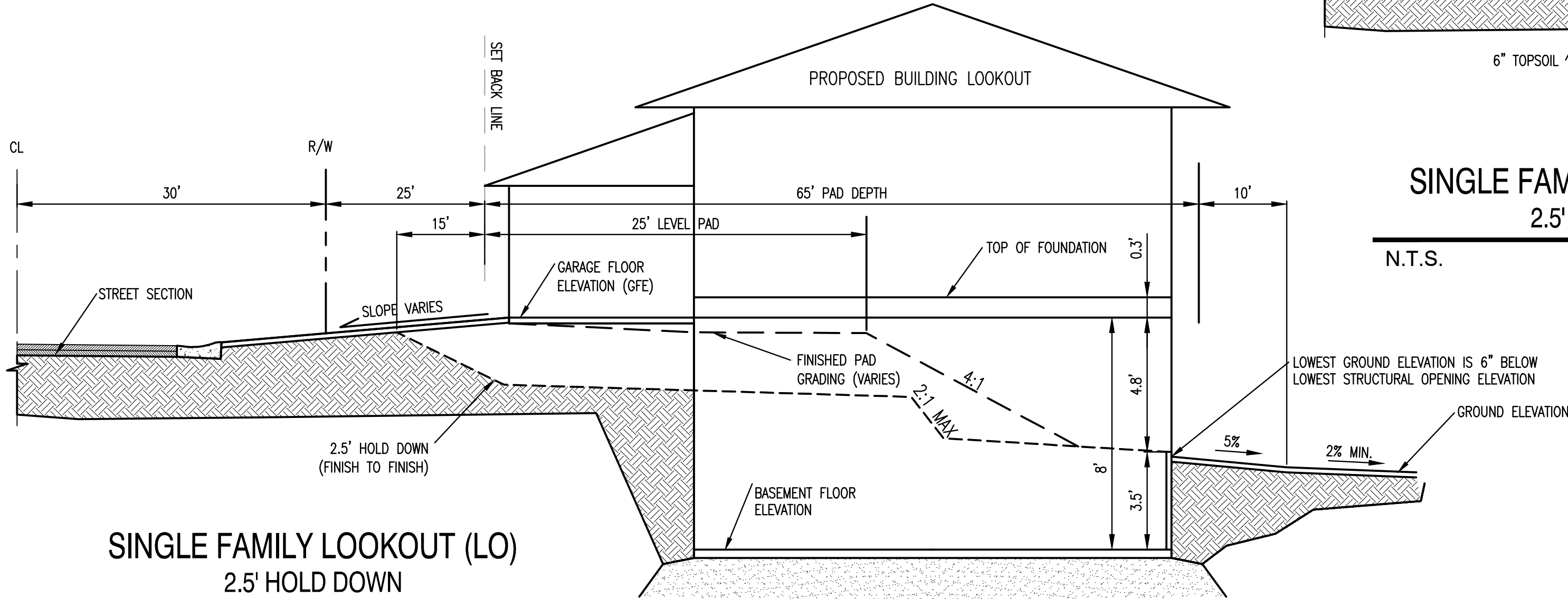
SINGLE FAMILY FULL BASEMENT (FB)
3.0' HOLD DOWN

N.T.S.



SINGLE FAMILY WALKOUT (WO)
2.5' HOLD DOWN

N.T.S.

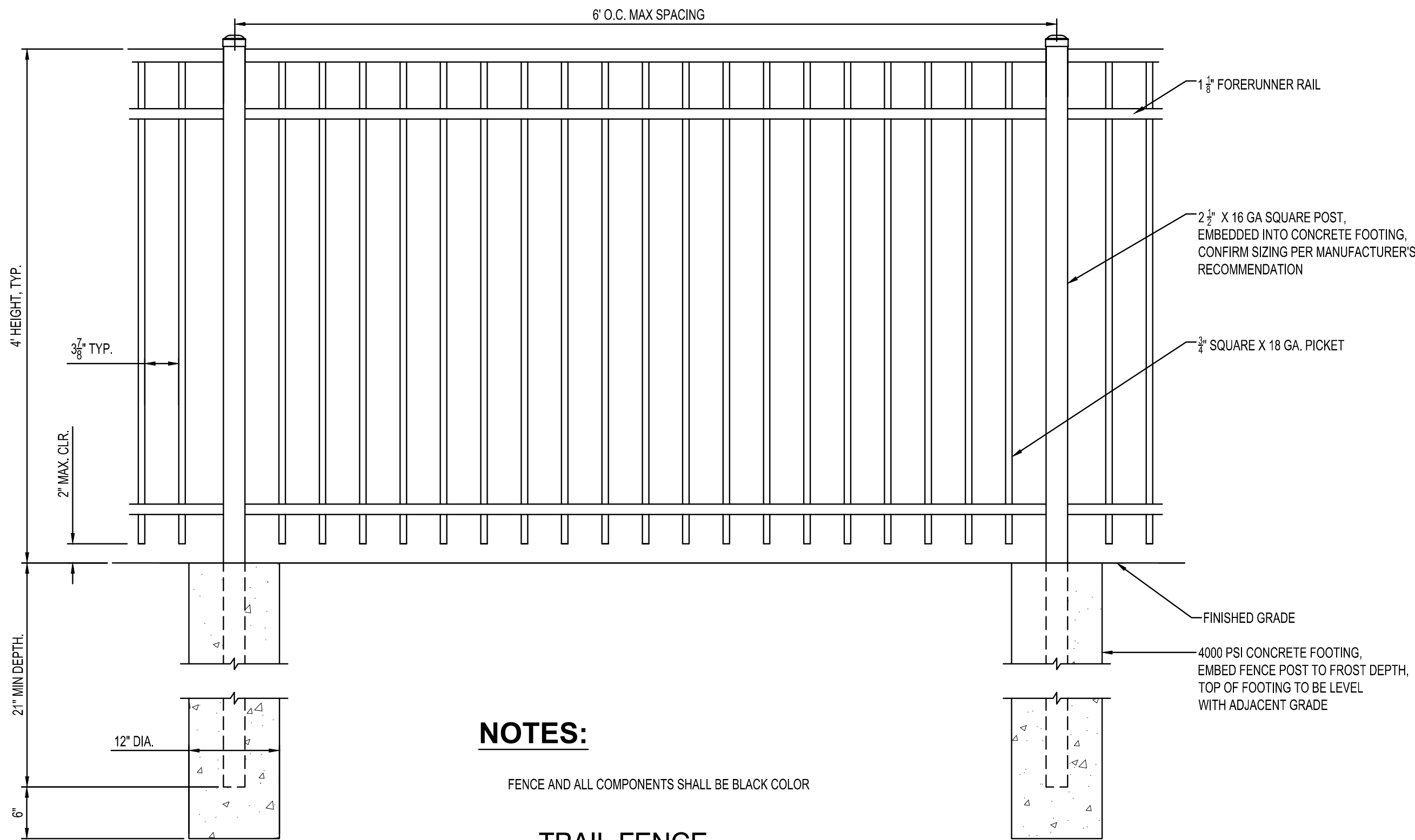
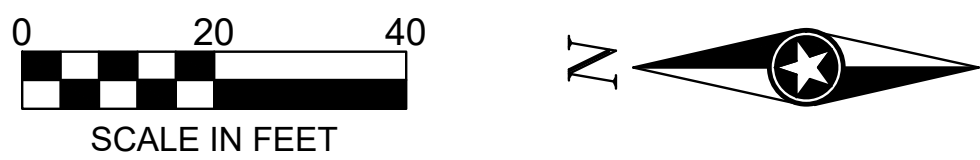
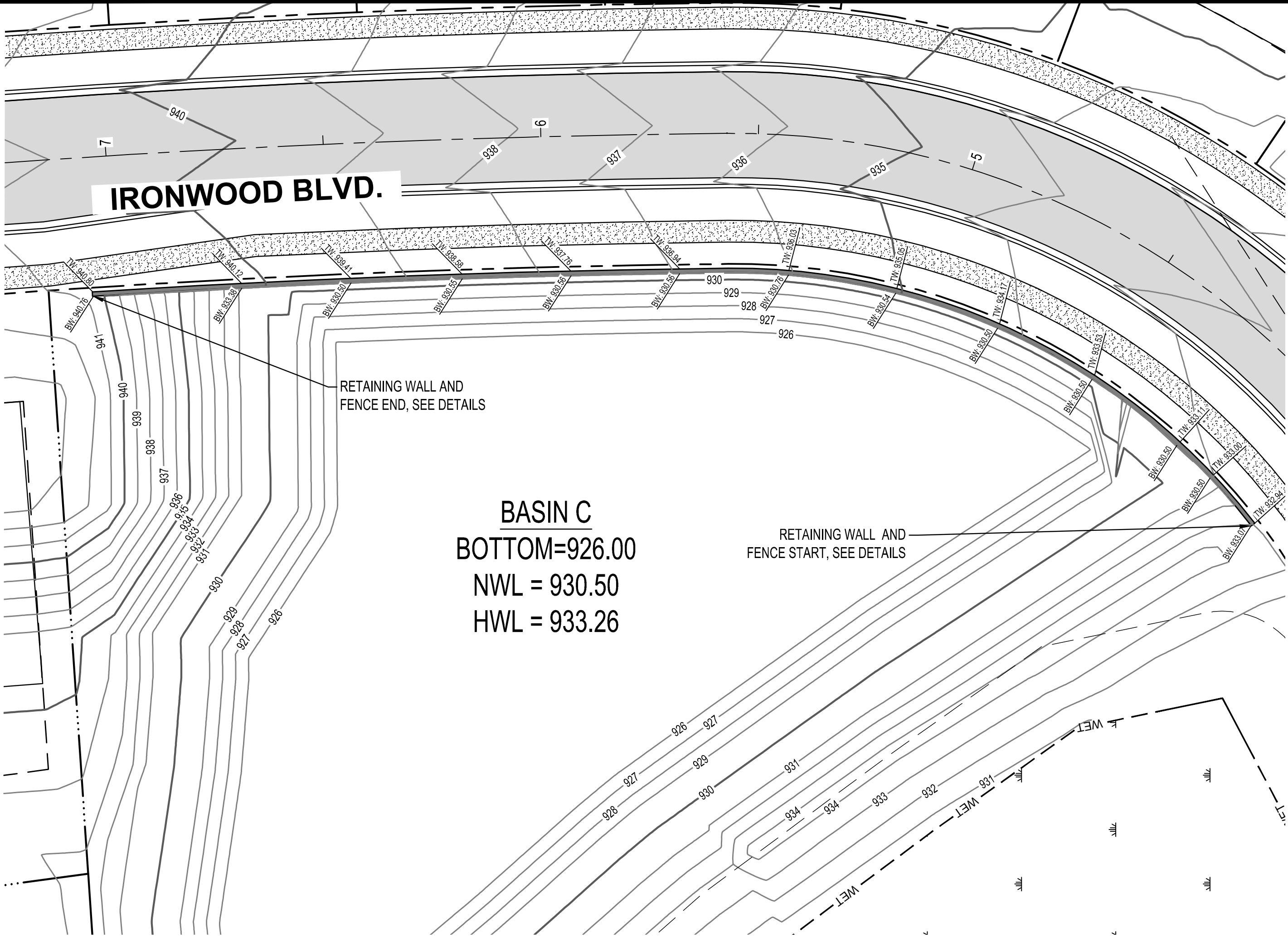


SINGLE FAMILY LOOKOUT (LO)
2.5' HOLD DOWN

N.T.S.

NOTE:
THESE DETAILS ARE FOR 65-FT WIDE SINGLE
FAMILY HOME PRODUCTS.

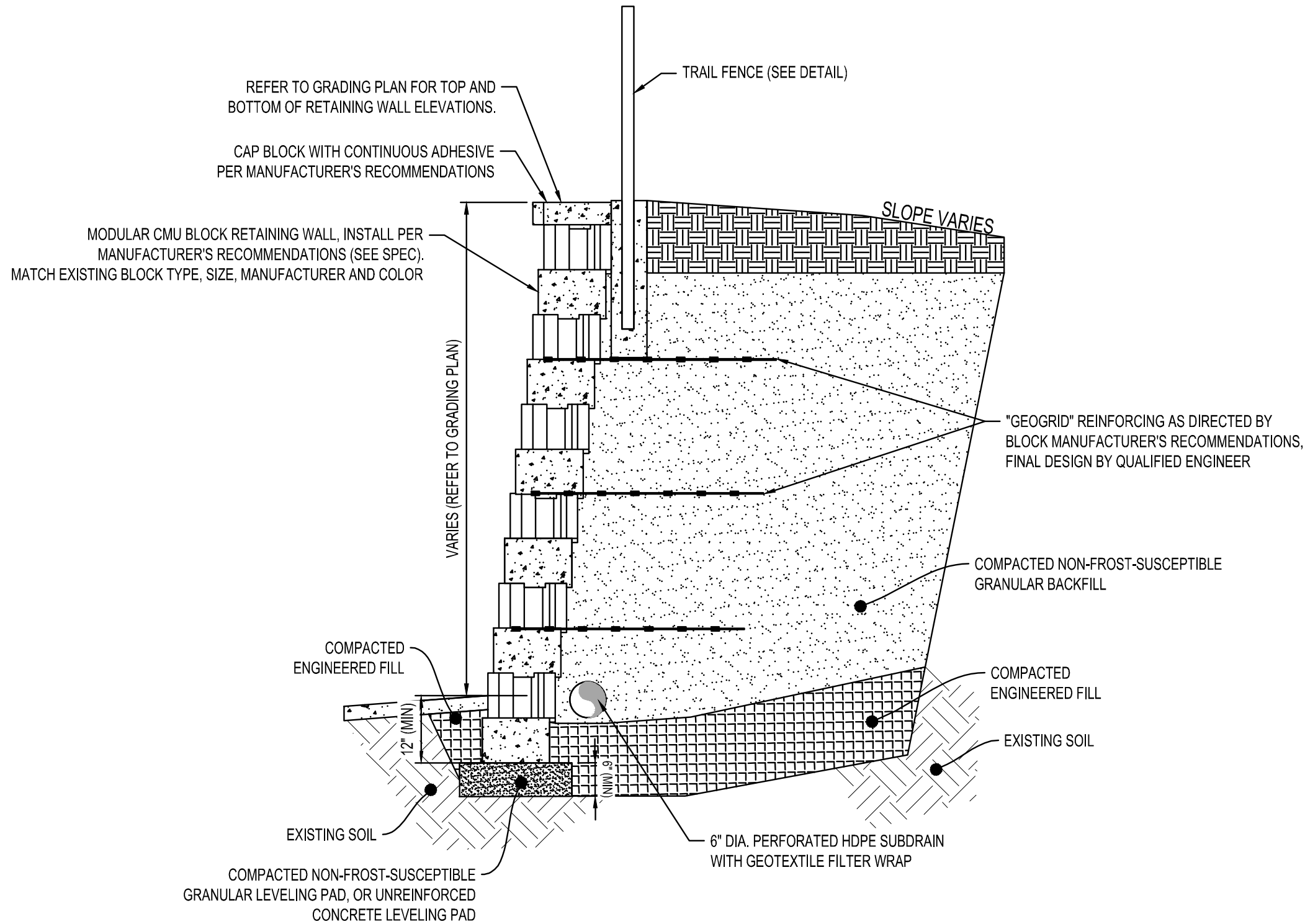
NOTE:
FB = FULL BASEMENT
LO = LOOK OUT BASEMENT
WO = WALKOUT BASEMENT
SELO = SPLIT ENTRY LOOKOUT BASEMENT
SEWO = SPLIT ENTRY WALKOUT BASEMENT
SOG = SLAB ON GRADE
THE FIRST ELEVATION LISTED REFERS TO
THE GARAGE FLOOR ELEVATION (GFE). THE SECOND
ELEVATION
LISTED REFERS TO THE LOWEST STRUCTURAL
OPENING (LSO). IF NO SECOND ELEVATION IS
LISTED THEN THE PRIMARY ELEVATION IS THE
LOWEST STRUCTURAL OPENING.
SEE DETAILS OF EACH TYPE.



NOTES:

FENCE AND ALL COMPONENTS SHALL BE BLACK COLOR

TRAIL FENCE
NTS



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MODULAR BLOCK RETAINING WALL DETAIL
NTS



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PROJECT

LENNAR

**RESERVE AT
AUTUMN WOODS**

CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	21-24984
FILE NAME	24984 WALL DETAIL
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

TITLE
**RETAINING
WALL-FENCE PLAN
AND DETAILS**

SHEET
5
OF 47

PRELIMINARY NOT FOR CONSTRUCTION



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TITLE

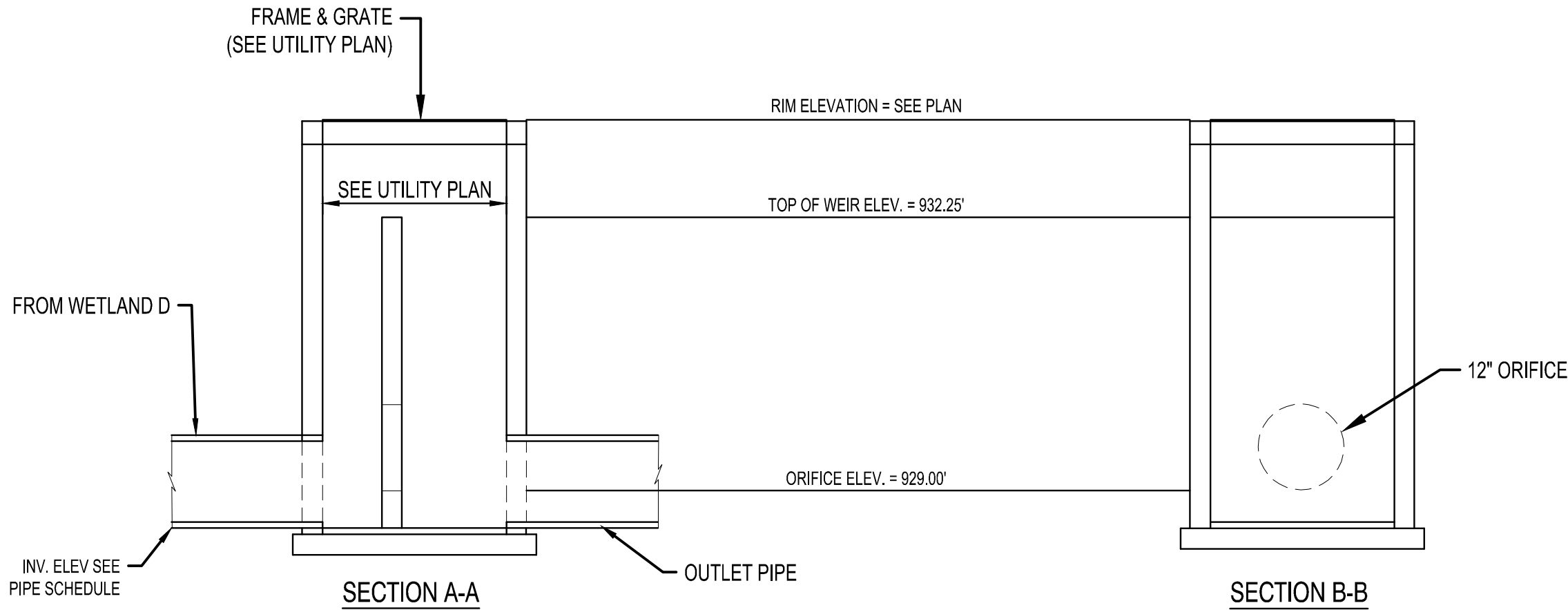
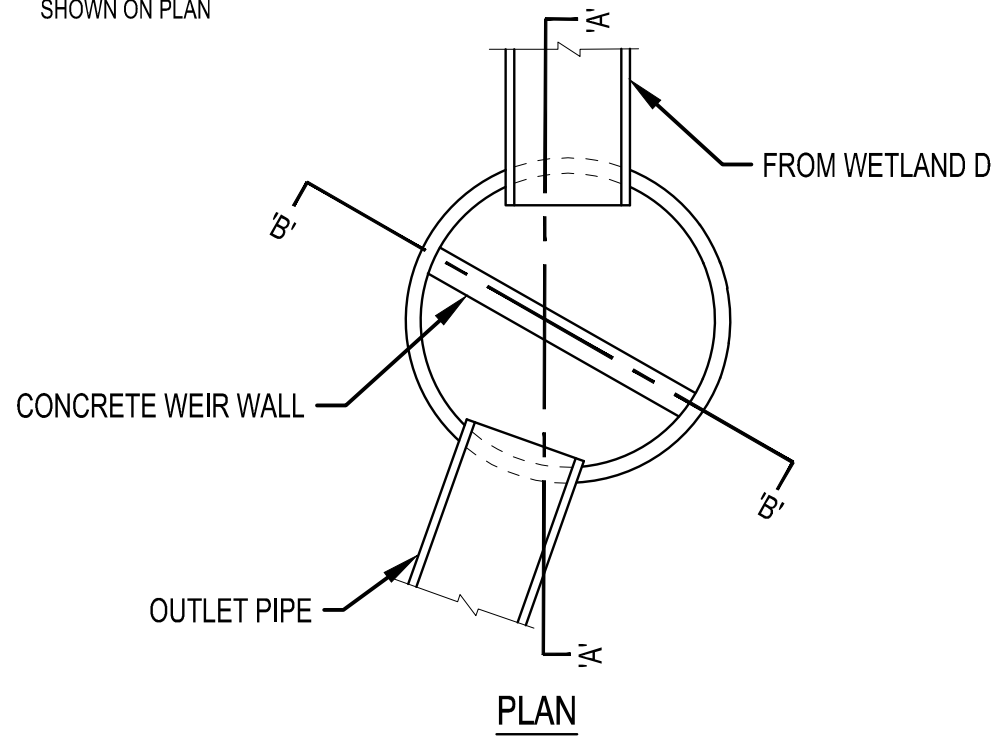
STORM WATER
BASIN DETAILS

SHEET

6

OF 47

*ACTUAL PIPE ORIENTATION
SHOWN ON PLAN

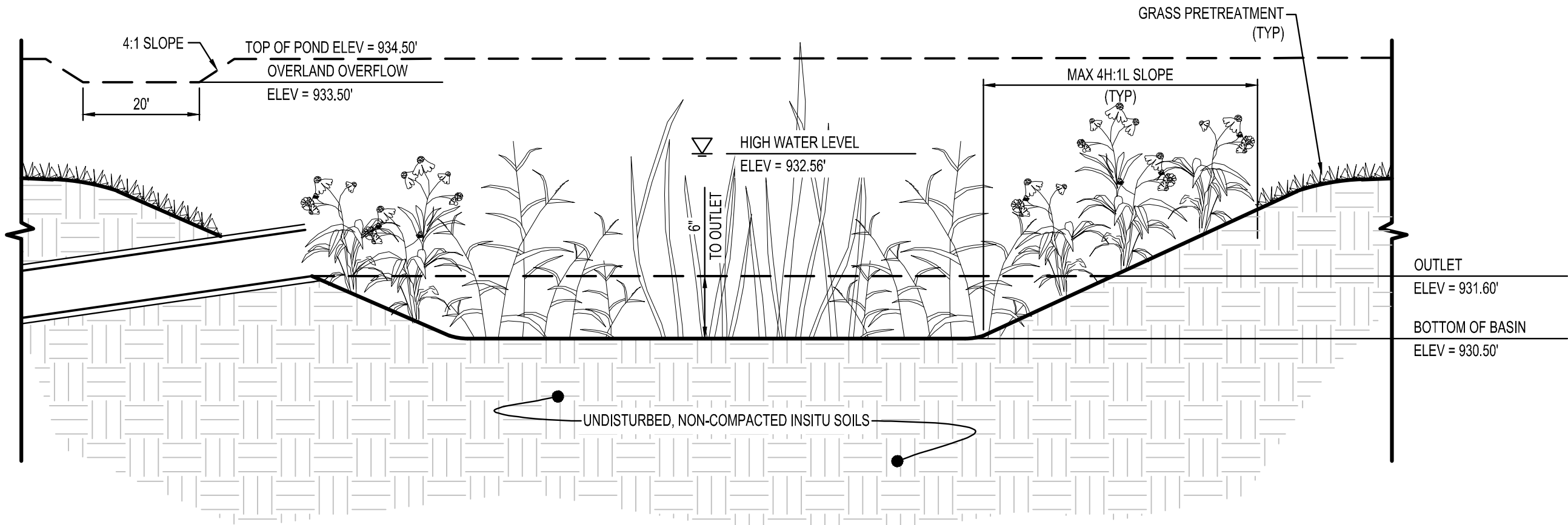


WETLAND D OUTLET STRUCTURE
NTS SD700

INFILTRATION BASIN CONSTRUCTION:

- Work Shall Include - All excavation and construction as outlined in the plans, specifications and details outlining the construction of the infiltration basin.
- The Contractor shall maintain silt fence around the perimeter of the infiltration basin during all phases of construction. The infiltration area must be staked off and marked to keep all construction traffic, equipment and material stockpiles out of the proposed infiltration area.
- The Contractor shall ensure that the infiltration basin is not used as a sediment trap during construction and that no runoff enters the basin prior to the completion of construction and complete stabilization of surrounding areas draining to the basin. All upland drainage must be diverted to prevent runoff from entering infiltration basin work area.
- Infiltration basin shall be constructed at the end of the project after all areas surrounding it and draining into it have been constructed and fully stabilized, this includes the sanitary sewer. In order to avoid soil compaction in the basin no equipment shall be driven in the area of the basin prior to its construction, and when it is constructed only light earth moving equipment with tracks shall be used.
- After final grading the basin's floor shall be tilled to a depth of at least 6 inches to provide a well-aerated, porous surface. Smearing of the soil in the basin shall be avoided and if smearing does occur it shall be corrected by raking or retiling of the basin.
- Immediately following infiltration basin construction, the entire basin shall be seeded and stabilized as indicated in the plans. Infiltration basin MUST be fully stabilized prior to any upstream runoff being directed to basin.
- Infiltration facilities shall not be excavated within 3-ft. of final grade until the contributing drainage area has been constructed and fully stabilized. Any accumulated sediment must be removed in a manner that prevents compaction of the bottom. To provided a well aerated, highly porous surface, the soils below an infiltration practice must be loosened to a minimum depth of 18-inches prior to planting

BASIN SEEDING:
Refer to SITE RESTORATION PLAN for basin seeding requirements.

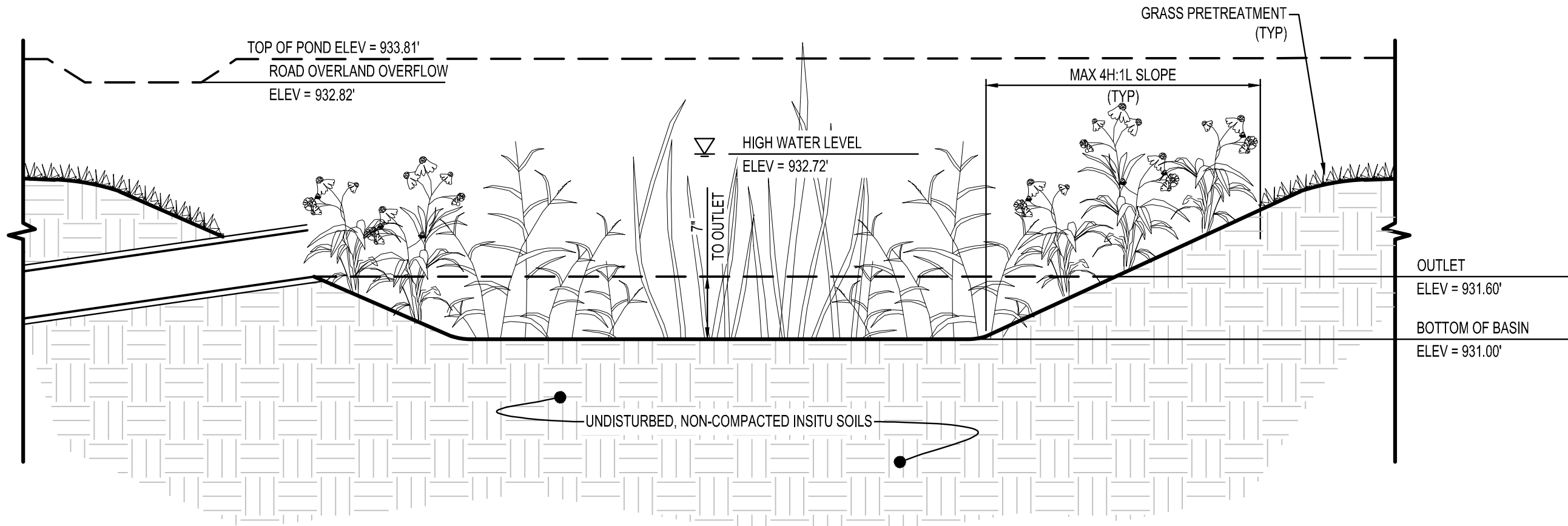


BASIN A INFILTRATION BASIN
NTS SD800

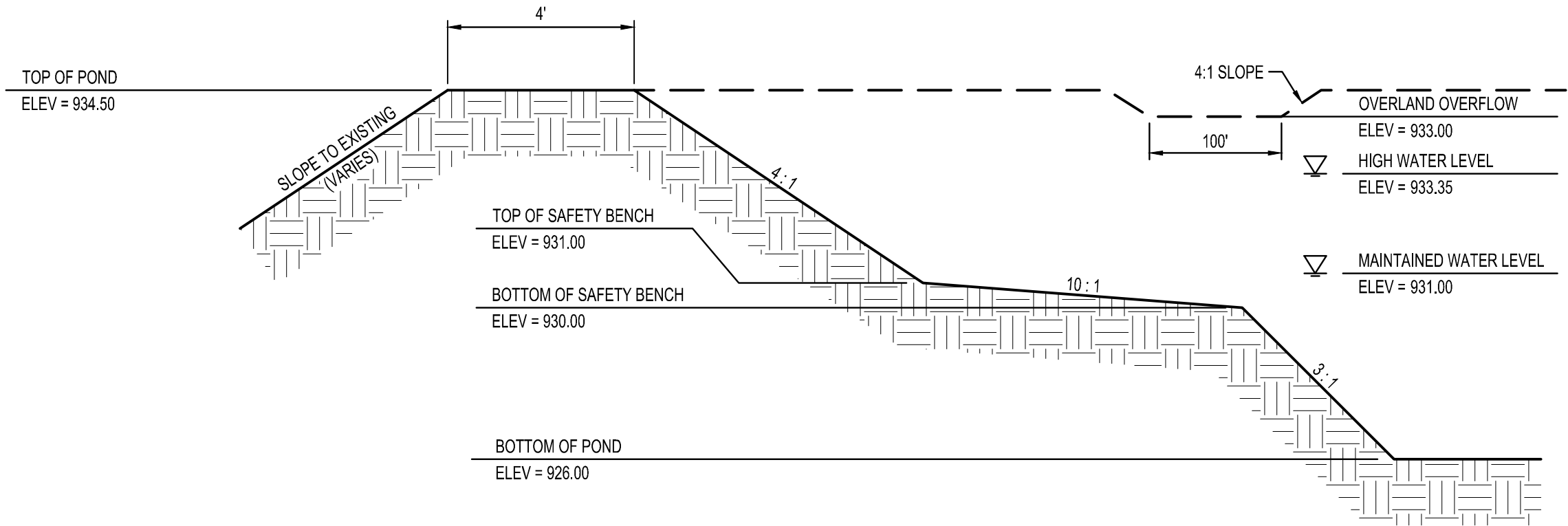
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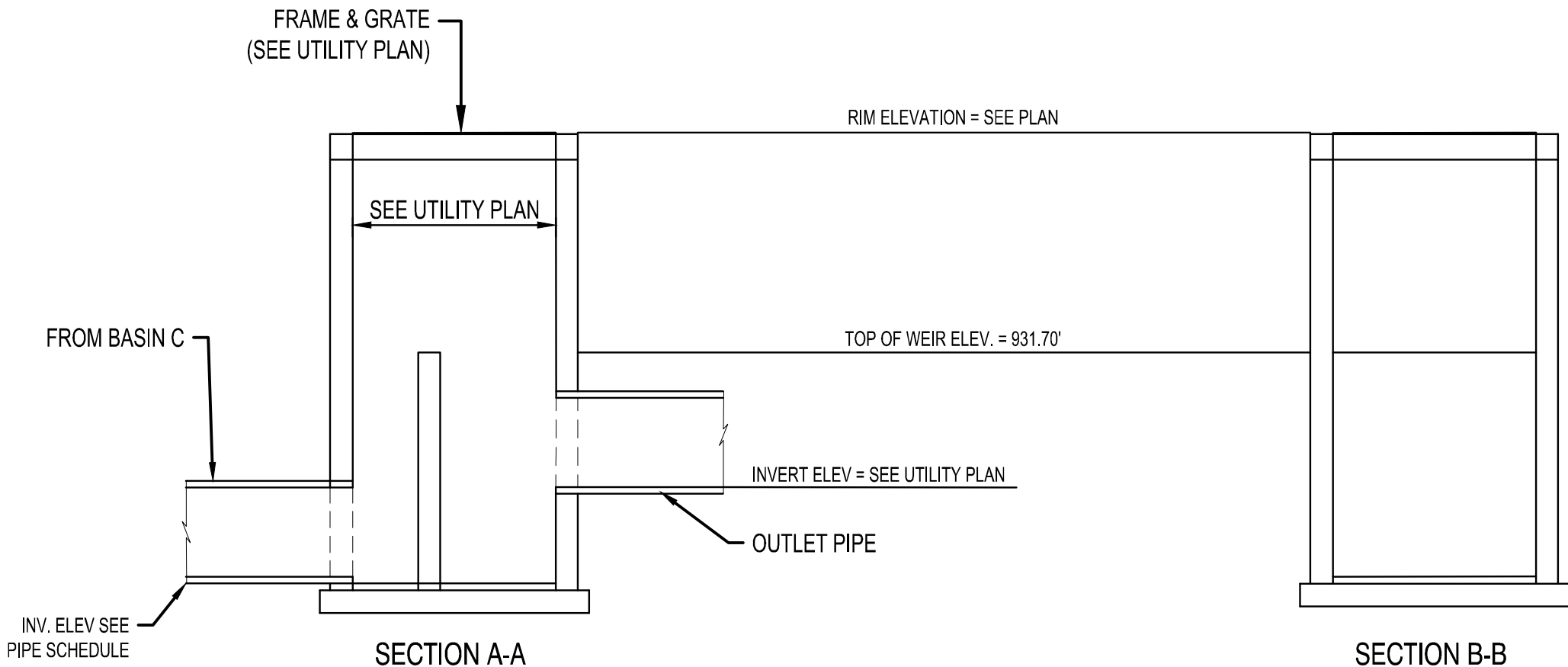
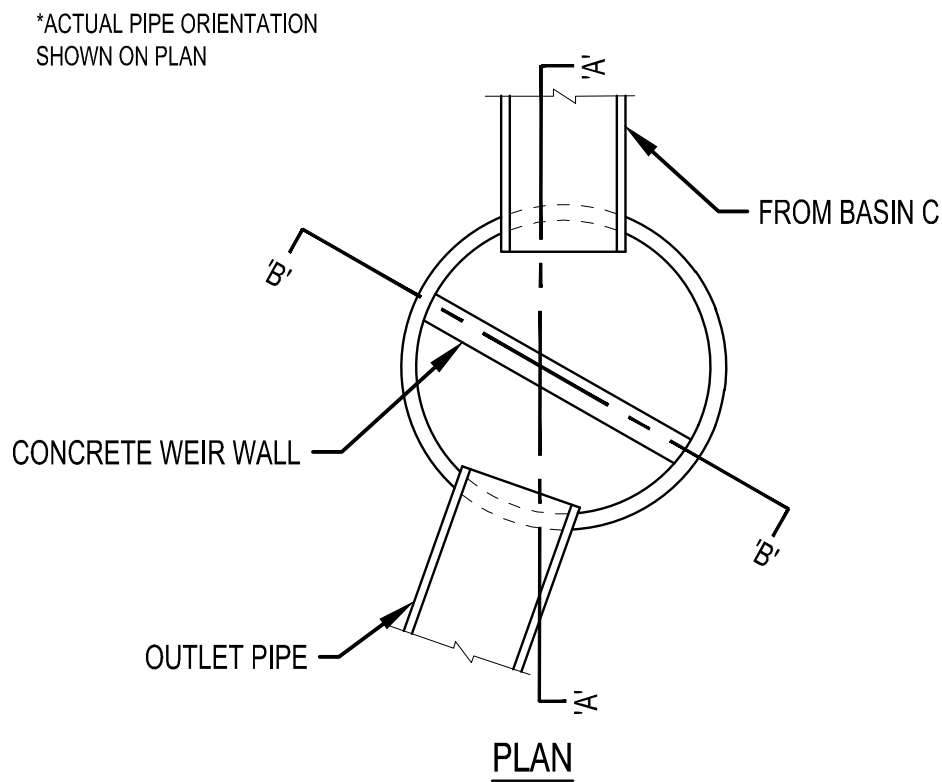
BASIN SEEDING:
Refer to SITE RESTORATION PLAN for basin seeding requirements.



BASIN B INFILTRATION BASIN
NTS SD800



BASIN C CROSS SECTION
NTS SD726

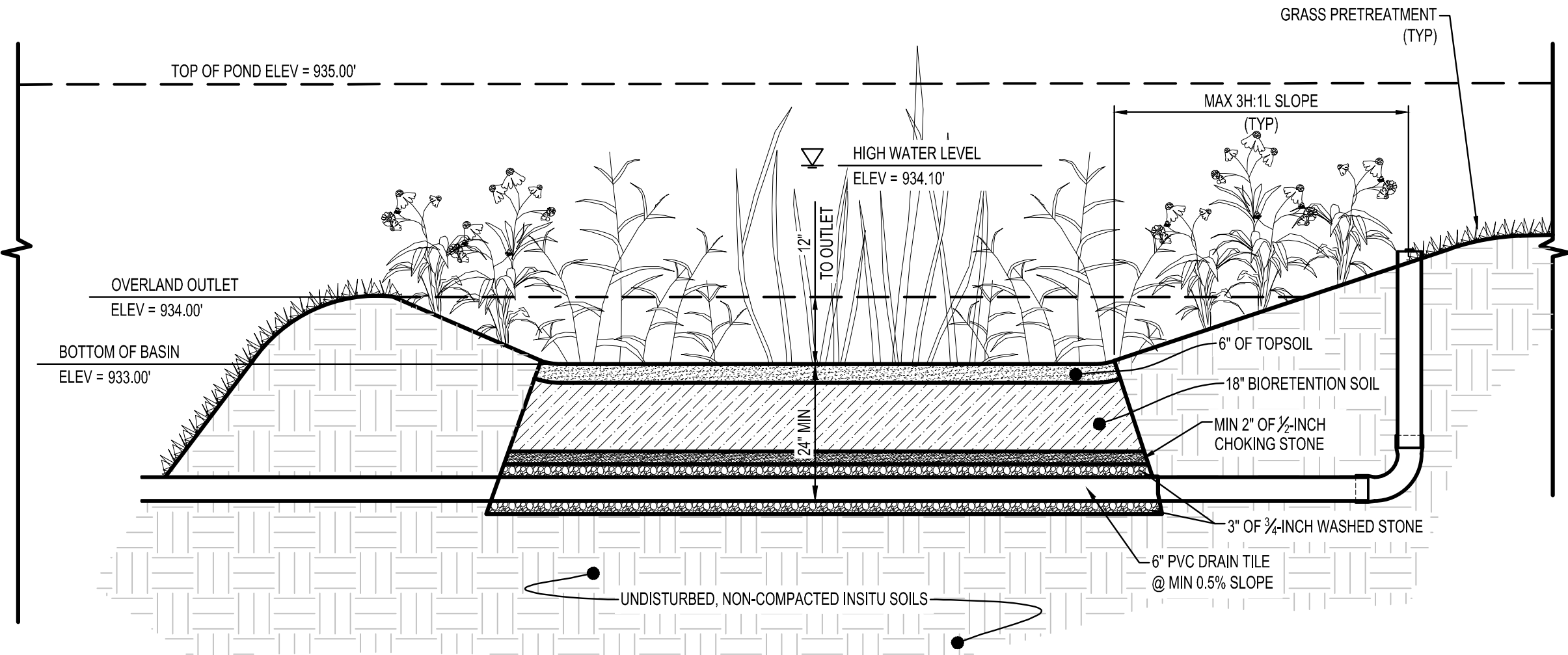


BASIN C OUTLET STRUCTURE
NTS SD700

- BIOFILTRATION BASIN CONSTRUCTION:**
- A. Work Shall Include - All excavation and construction as outlined in the plans, specifications and details outlining the construction of the filtration basin.
 - B. The Contractor shall maintain silt fence around the perimeter of the filtration basin during all phases of construction. The filtration area must be staked off and marked to keep all construction traffic, equipment and material stockpiles out of the proposed filtration area.
 - C. The Contractor shall ensure that the filtration basin is not used as a sediment trap during construction and that no runoff enters the basin prior to the completion of construction and complete stabilization of surrounding areas draining to the basin. All upland drainage must be diverted to prevent runoff from entering filtration basin work area.
 - D. Filtration basin shall be constructed at the end of the project after all areas surrounding it and draining into it have been constructed and fully stabilized, this includes the sanitary sewer. In order to avoid soil compaction in the basin no equipment shall be driven in the area of the basin prior to its construction, and when it is constructed only light earth moving equipment with tracks shall be used.
 - E. After final grading the basin's floor shall be tilled to a depth of at least 6 inches to provide a well-aerated, porous surface. Smearing of the soil in the basin shall be avoided and if smearing does occur it shall be corrected by raking or retiling of the basin.
 - F. Immediately following filtration basin construction, the entire basin shall be seeded and stabilized as indicated in the plans. Filtration basin MUST be fully stabilized prior to any upstream runoff being directed to basin.

- BIORETENTION SOIL:**
- 80 percent washed construction sand (AASHTO M-6 or ASTM C-33)
 - 20 percent organic matter (MnDOT Grade 2 compost)
 - Recommended P content between 12 and 30 mg/kg per Mehlich III (or equivalent) test

BASIN SEEDING:
Refer to SITE RESTORATION PLAN for basin seeding requirements.



BASIN D BIOFILTRATION BASIN
NTS SD800



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JEREMY D. FOSS

DATE: _____ LIC. NO. 55871

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PROJECT

**LENNAR
RESERVE AT
AUTUMN WOODS**

CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	21-24984
FILE NAME	24984 DETAILS
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

TITLE
**STORM WATER
BASIN DETAILS**

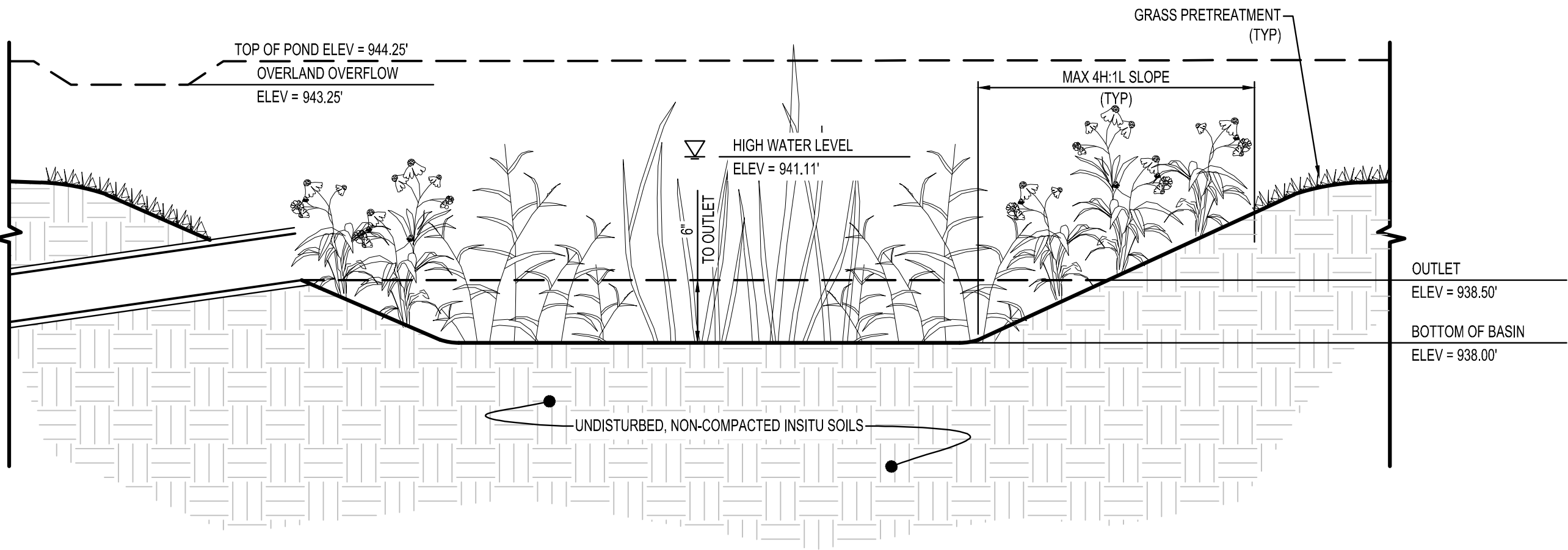
SHEET
7
OF 47

PRELIMINARY NOT FOR CONSTRUCTION

INFILTRATION BASIN CONSTRUCTION:

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BASIN SEEDING:
Refer to SITE RESTORATION PLAN for basin seeding requirements.

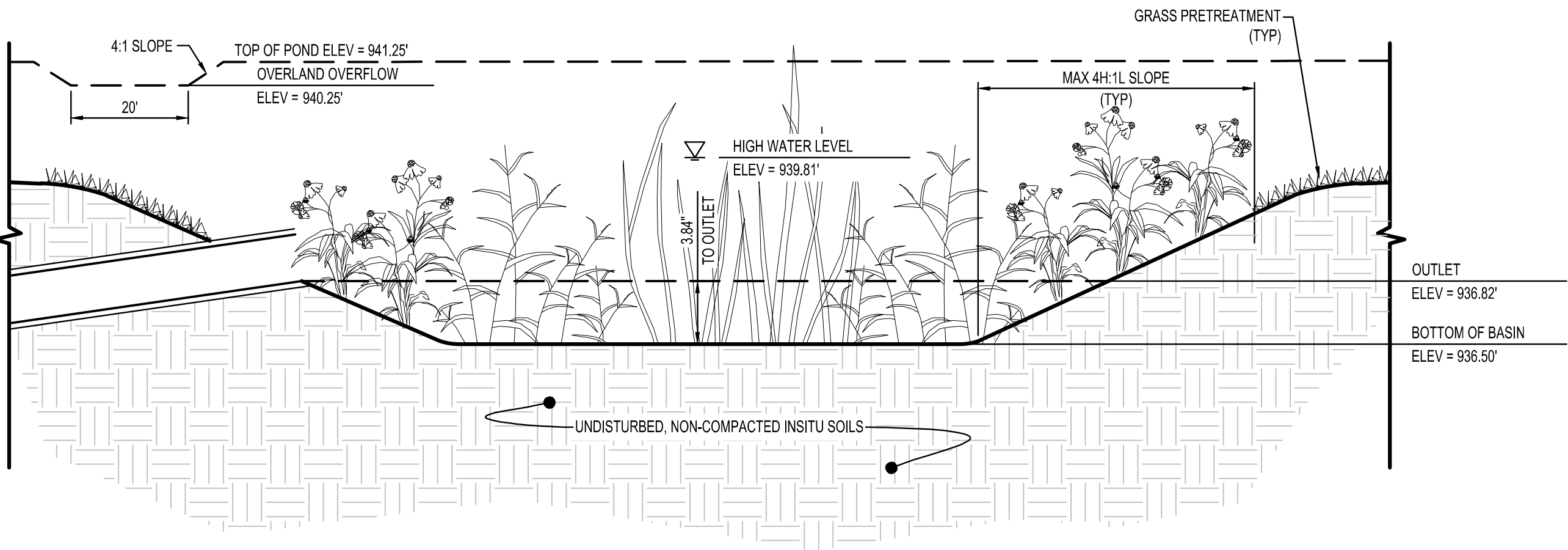


BASIN E INFILTRATION BASIN
NTS SD800

INFILTRATION BASIN CONSTRUCTION:

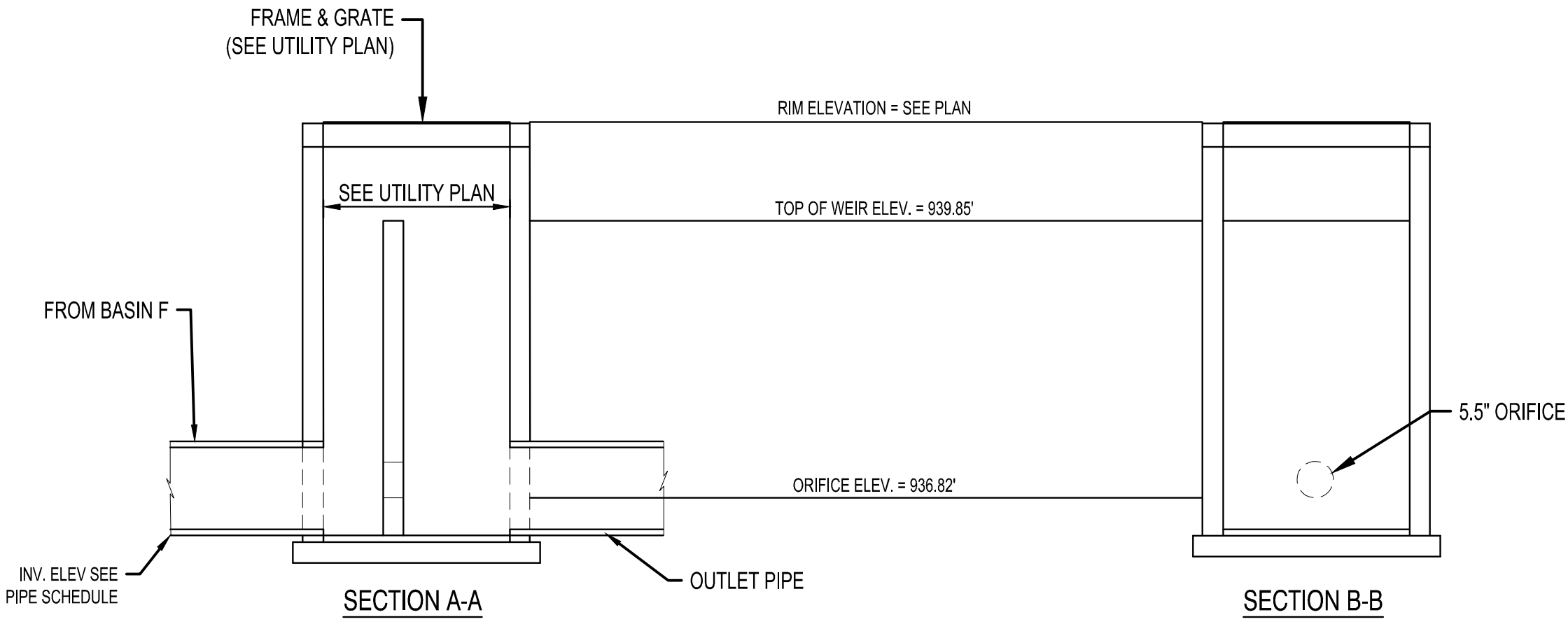
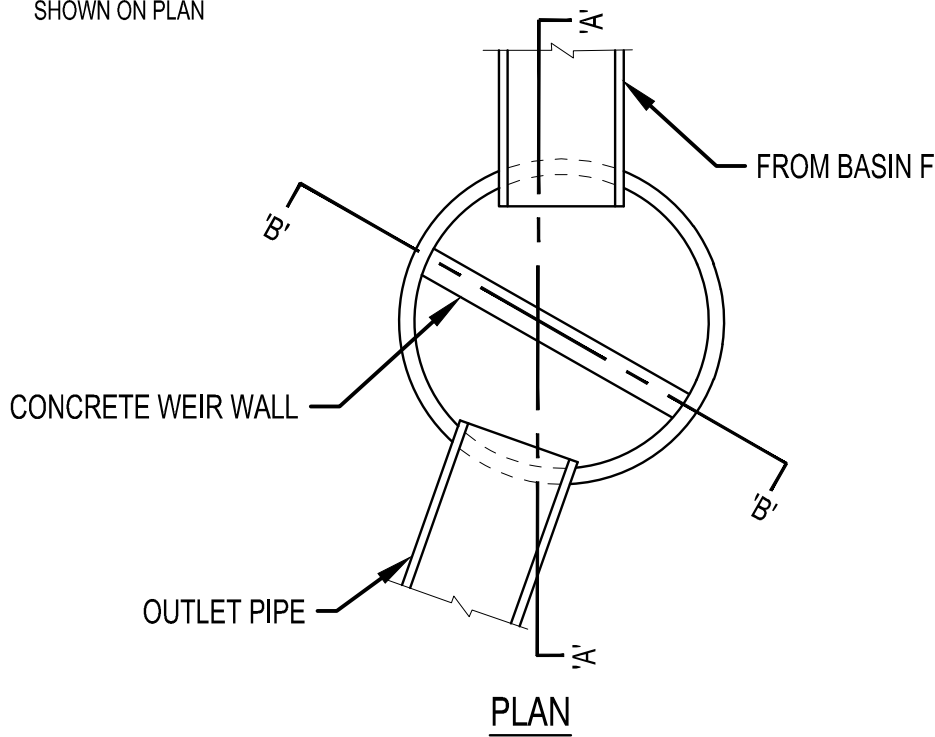
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BASIN SEEDING:
Refer to SITE RESTORATION PLAN for basin seeding requirements.



BASIN F INFILTRATION BASIN
NTS SD800

*ACTUAL PIPE ORIENTATION
SHOWN ON PLAN



BASIN F OUTLET STRUCTURE
NTS SD700



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PROJECT

**LENNAR
RESERVE AT
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CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

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FILE NAME	24984 DETAILS
DRAWN BY	JRS
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CLIENT PROJECT NO.	-

TITLE

**STORM WATER
BASIN DETAILS**

SHEET

8

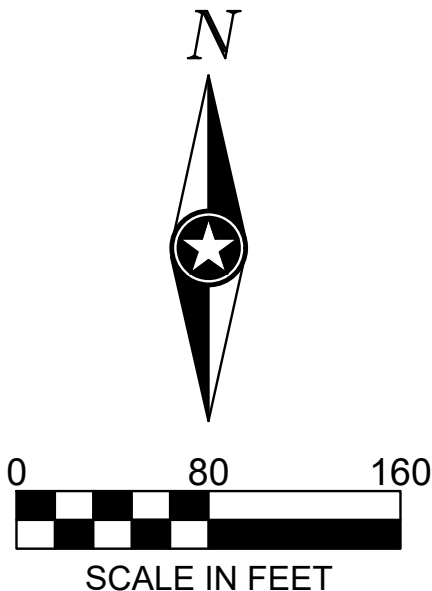
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SHEET

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REVISION SCHEDULE		
DATE	DESCRIPTION	BY

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FILE NAME	24984 SWPPP DETAILS
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CLIENT PROJECT NO.	-

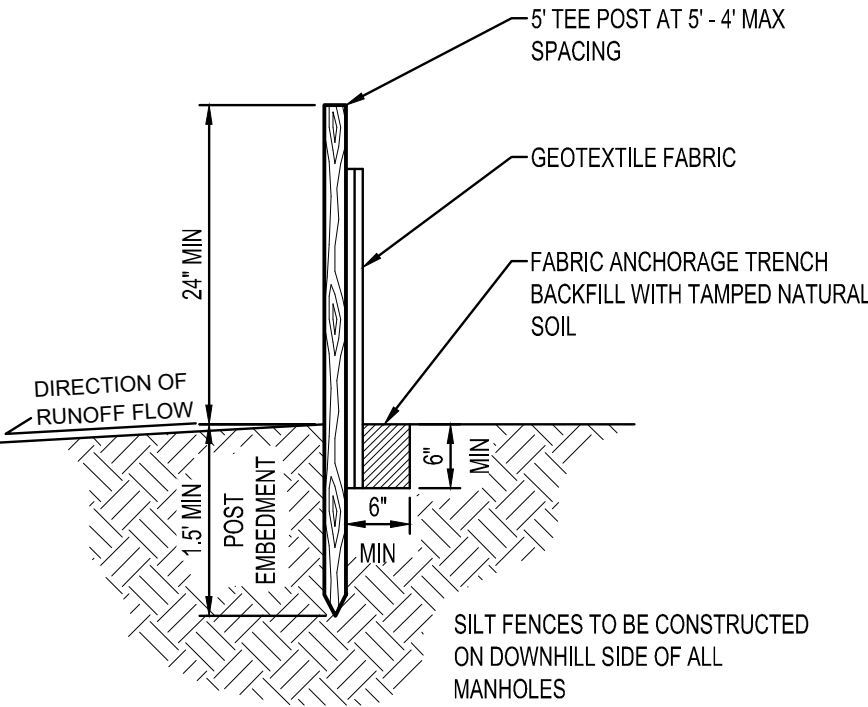
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SWPPP DETAILS

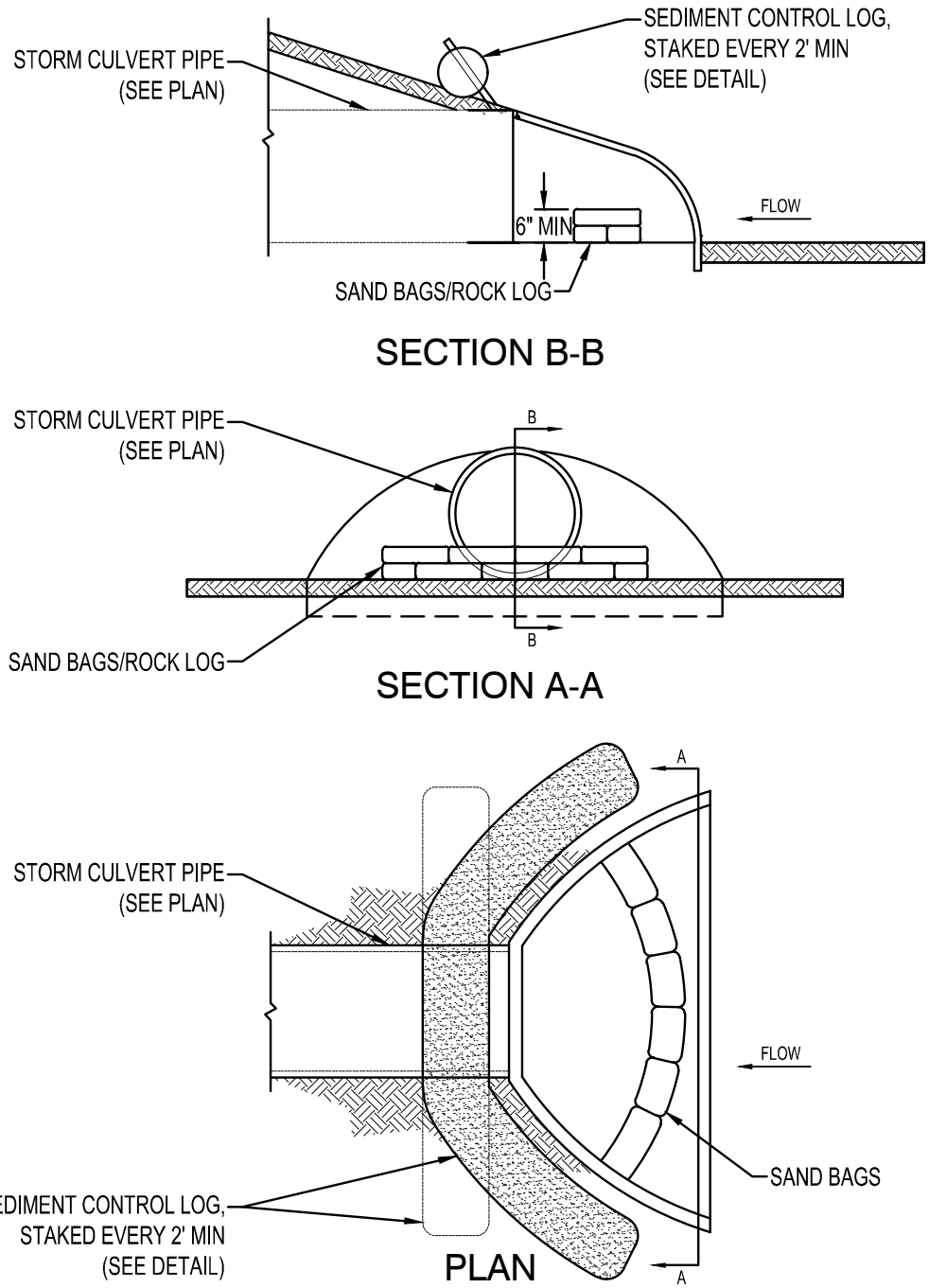
SHEET

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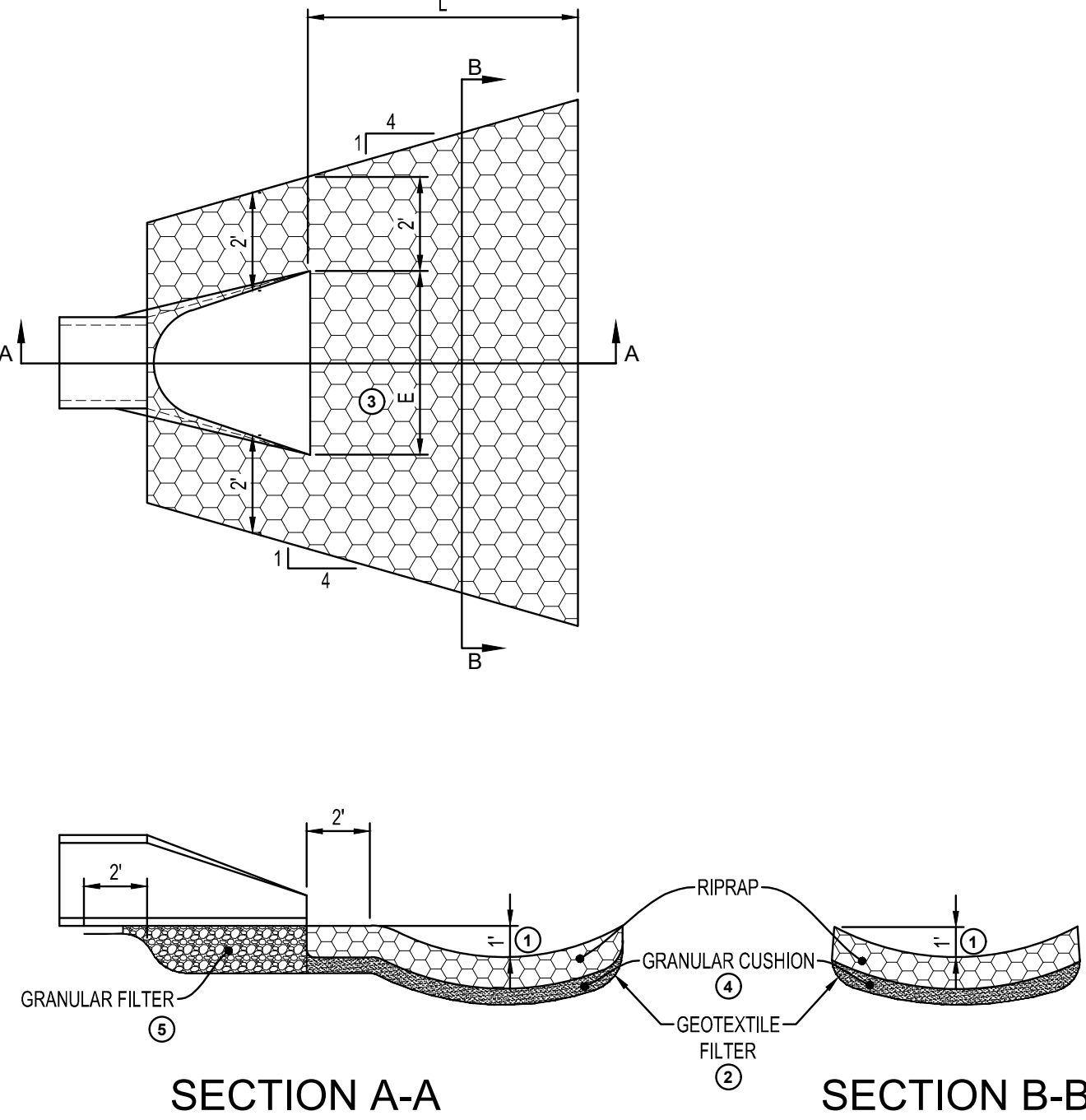
OF 47



SILT FENCE
NTS EC100



CULVERT PIPE
DITCH CHECK
NTS EC345



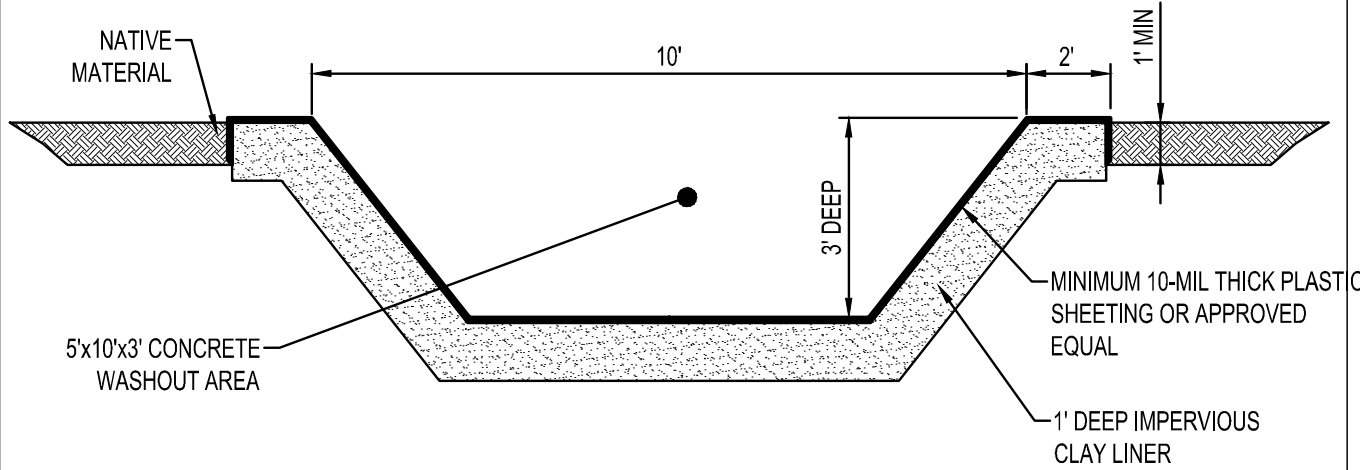
RIPRAP AT RCP OUTLET
NTS EC400

DIMENSIONS

PIPE Ø (INCHES)	L (FEET)	PIPE Ø (INCHES)	L (FEET)
12	8	27	12
15	8	30	14
18	10	36	16
21	10	42	18
24	12	48	20

NOTES:

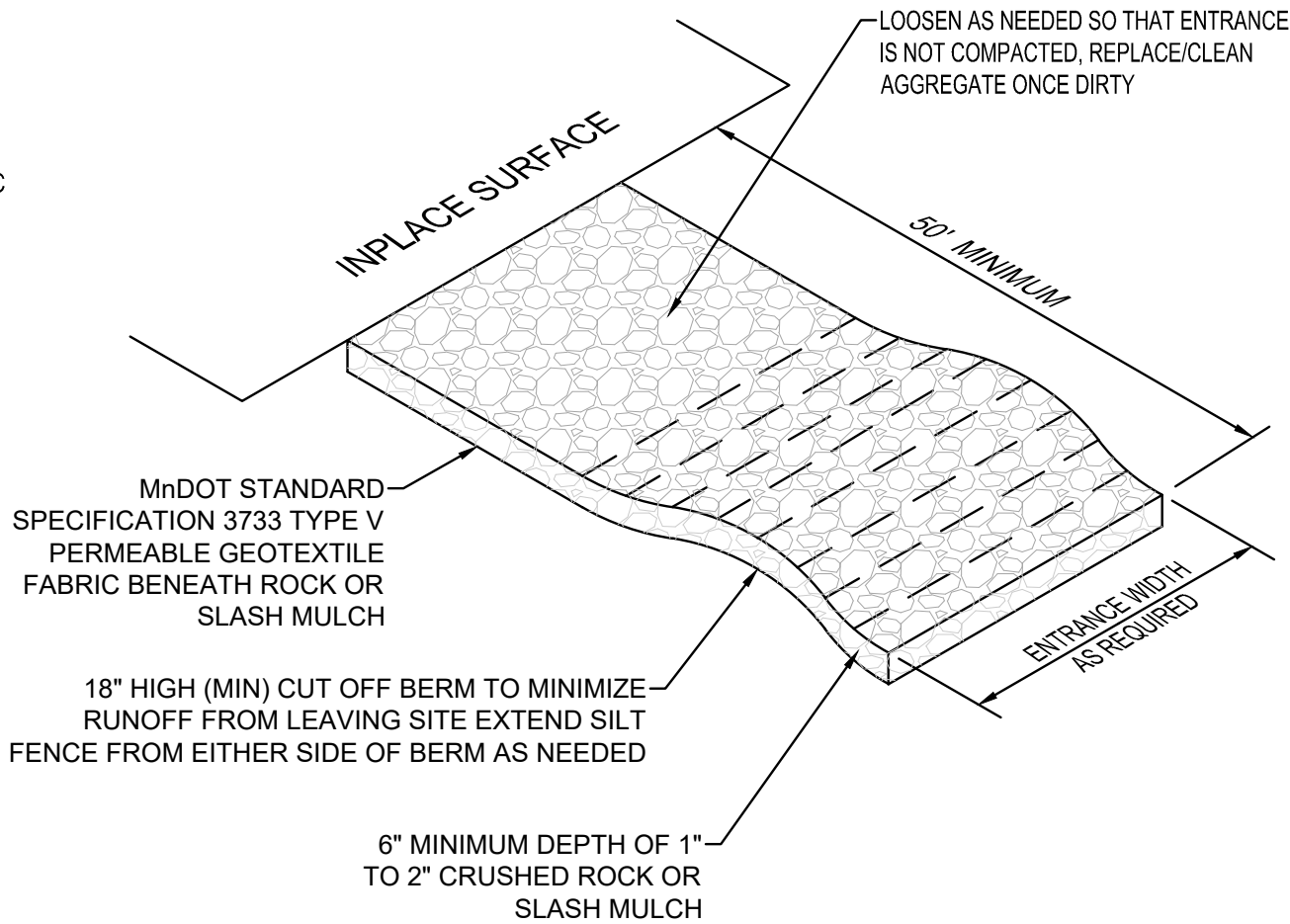
- REQUIREMENTS FOR GEOTEXTILE TYPE, RIPRAP SIZE AND THICKNESS WILL BE DESIGNATED IN THE PLANS.
- PIPE SIZES LARGER THAN THOSE SHOWN REQUIRE A SPECIAL DESIGN
- FOR PIPES GREATER THAN OR EQUAL TO 30", USE 1.5'
 - GEOTEXTILE FILTER, MNDOT SPEC. 3733, SHALL COVER THE BOTTOM AND SIDES OF THE AREA EXCAVATED FOR THE RIPRAP, GRANULAR FILTER MATERIALS
 - DIMENSION "E" IS GIVEN ON MNDOT STANDARD PLATES 3100 AND 3110.
 - GRANULAR FILTER, MNDOT SPEC. 3601, MAY BE USED AS A CUSHION LAYER. PLACE FILTER PER SPEC. 2511. THE CUSHION LAYER IS INCIDENTAL.
 - GRANULAR FILTER OR RIPRAP, SPEC. 3601, TO EXTEND UNDER THE ENTIRE OPEN PORTION OF PIPE APRON. DEPTH OF MATERIAL UNDER APRON SHALL MATCH RIPRAP DEPTH. WHEN USING RIPRAP, INCREASE RIPRAP QUANTITY ACCORDINGLY AND PLACE A 3" LAYER OF 1.5" CRUSHED ROCK UNDER THE APRON TO AID IN GRADING FOR APRON PLACEMENT. CRUSHED ROCK IS INCIDENTAL.



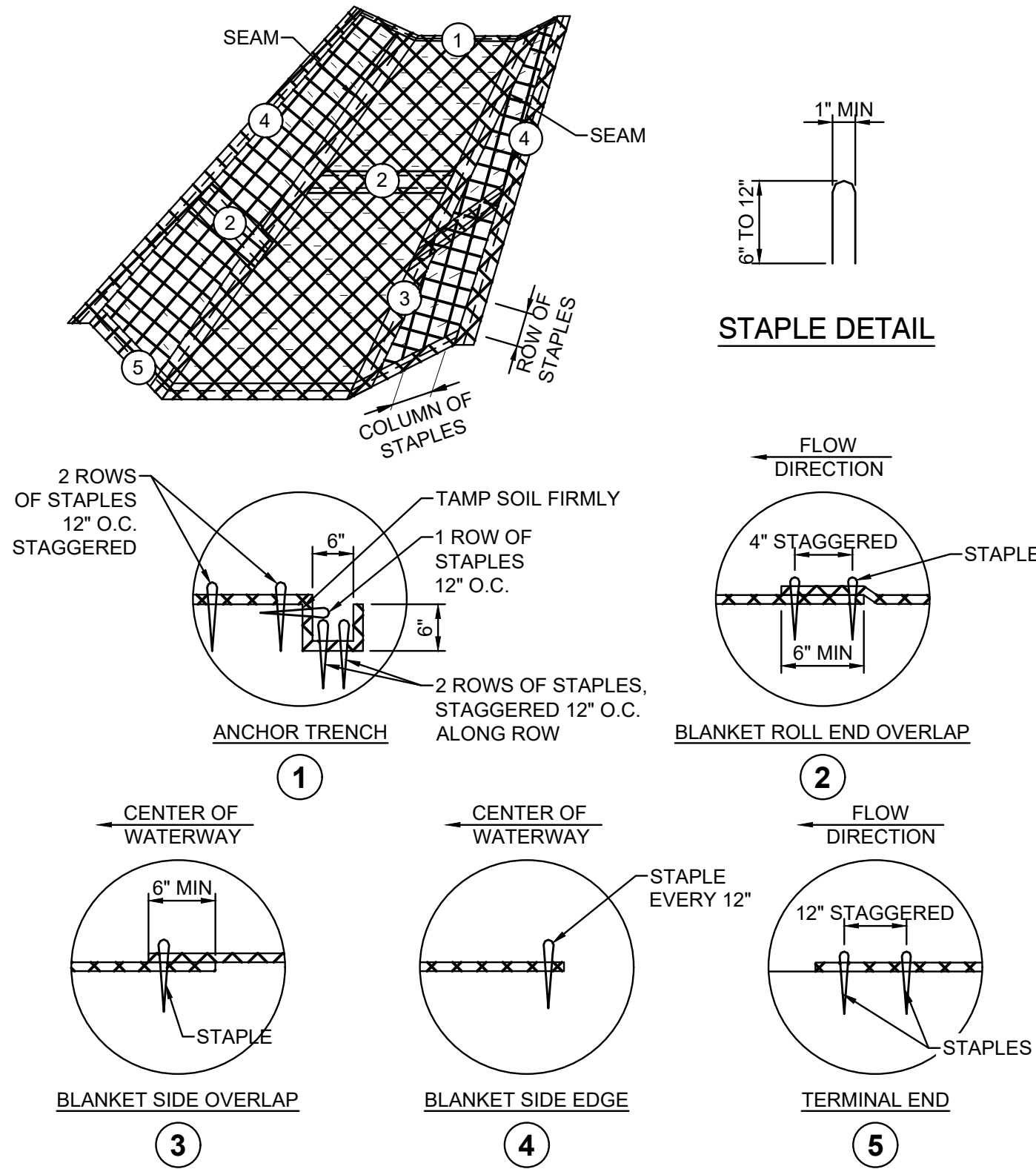
NOTES:

- CONTRACTOR SHALL INSTALL A SIGN INDICATING THE CONCRETE WASHOUT AREA.
- CONTRACTOR SHALL MAINTAIN WASHOUT AREA TO REMOVE MATERIALS BEYOND 75% CAPACITY.
- WASHOUT AREA SHALL NOT BE PLACED WITHIN 50' OF STORM DRAINS, OPEN DITCHES OR BODIES OF WATER.
- CONTRACTOR SHALL INSPECT WASHOUT AREA AS NECESSARY TO PREVENT LEAKS AND OVER TOPPING.
- WASHOUT AREA SHALL BE REMOVED AFTER CONSTRUCTION IS COMPLETE.

CONCRETE WASHOUT
NTS EC500



STABILIZED CONSTRUCTION EXIT
NTS EC600

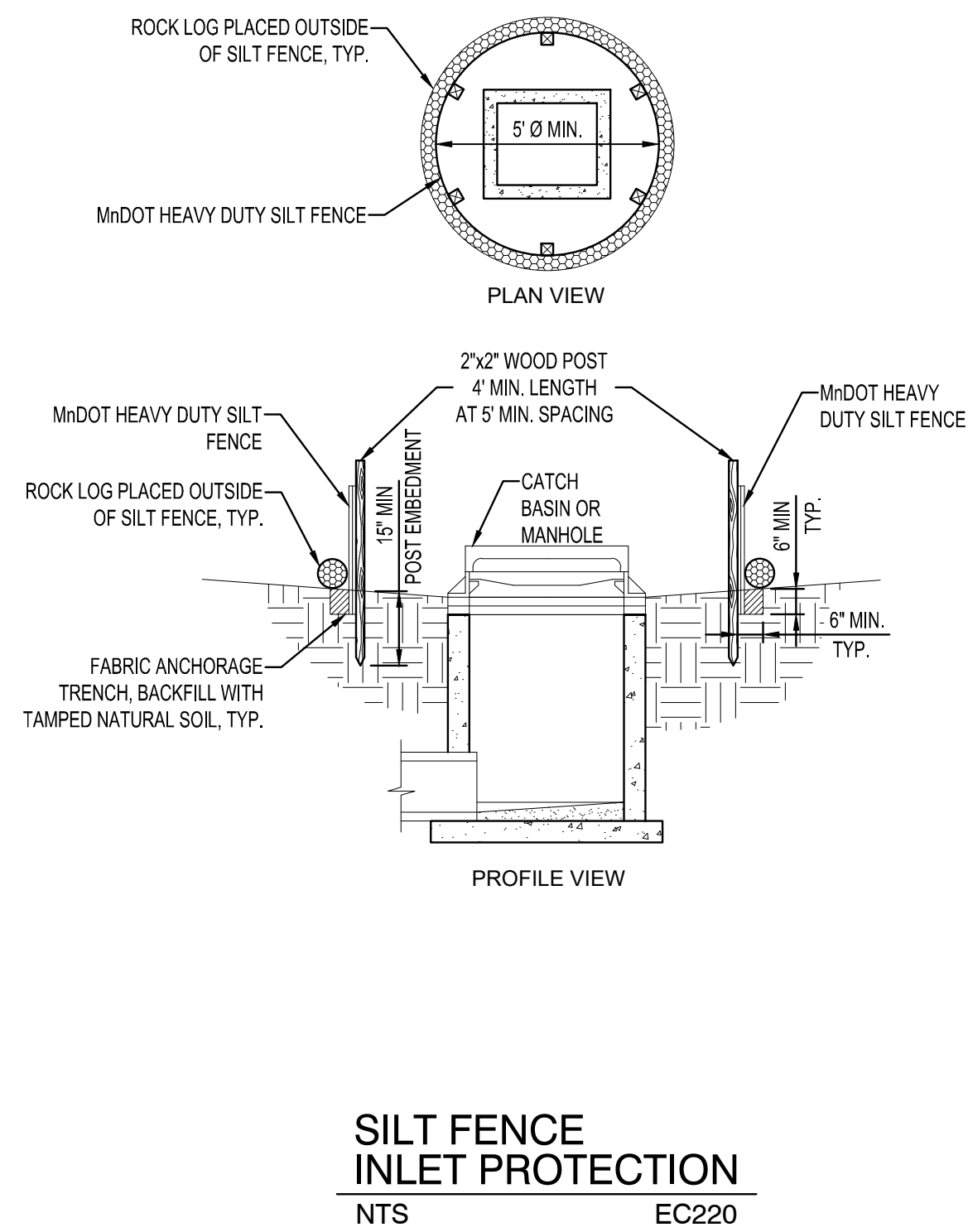


NOTES:

- INSTALL EROSION CONTROL BLANKET (ECB) OVER WATERWAYS AS SHOWN IN THE STORM WATER POLLUTION PREVENTION PLAN.
- THE ECB SHALL CONFORM TO MNDOT STANDARD SPECIFICATIONS SECTION 3885.
- PREPARE SOIL PRIOR TO INSTALLING ECB, INCLUDING SEEDING AND FERTILIZING.
- THE ECB SHALL BE PLACED IN FIRM CONTACT WITH THE SOIL AND NOT BE ALLOWED TO BRIDGE OVER SURFACE IRREGULARITIES. THE MAT SHALL NOT BE STRETCHED.
- START LAYING THE MATS BY ROLLING CENTER MAT IN THE DIRECTION OF FLOW, CENTERED ON THE CENTERLINE OF WATERWAY. THERE SHALL NOT BE AN OVERLAP OF MATS AT THE CENTER OF THE WATERWAY.
- THE ECB SHALL BE ANCHORED, OVERLAPPED, AND STAPLED ACCORDING TO MANUFACTURER'S INSTRUCTIONS. IF NO MANUFACTURER'S INSTRUCTIONS ARE AVAILABLE, INSTALL THE MAT AS FOLLOWS.
- STAPLES SHALL BE "U" SHAPED, 0.12" DIAMETER WIRE OR GREATER (#11 GAUGE). (SEE STAPLE DETAIL FOR DIMENSIONS)
- BURY UPSTREAM END OF MAT IN A TRENCH 6" WIDE BY 6" DEEP AND STAPLED IN STAGGERED ROWS ACROSS THE WIDTH AS SHOWN IN DETAIL 1.
 - FOR JOINING ENDS OF ROLLS, OVERLAP END OF UP SLOPE MAT A MINIMUM OF 6" OVER DOWN SLOPE MAT (SHINGLE STYLE). USE A DOUBLE ROW OF STAGGERED STAPLES 4" APART, AS SHOWN IN DETAIL 2.
 - MATS ON SIDE SLOPES SHALL OVERLAP A MINIMUM OF 6" OVER THE MAT BELOW (SHINGLE STYLE). STAPLE OVERLAP AT 12" INTERVALS. (SEE DETAIL 3)
 - THE OUTER EDGE ALONG SIDES OF THE MAT SHALL BE STAPLED EVERY 12". (SEE DETAIL 4)
 - STAPLES ARE TO BE PLACED ALTERNATELY IN COLUMNS (IN THE DIRECTION OF THE WATERWAY) 2' APART AND IN ROWS (ACROSS THE WATERWAY) 3' APART THROUGHOUT THE AREA COVERED BY THE ECB.
 - DOWNSTREAM (TERMINAL) END OF BLANKET SHALL BE STAPLED WITH A DOUBLE ROW OF STAGGERED STAPLES 12" APART. (SEE DETAIL 5)

EROSION CONTROL BLANKET INSTALLATION
NTS EC700

PRELIMINARY NOT FOR CONSTRUCTION



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PROJECT

LENNAR

**RESERVE AT
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CHASKA MINNESOTA

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FILE NAME	24984 SWPPP DETAILS
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TITLE

SWPPP DETAILS

SHEET

12

DF 47

EROSION CONTROL QUANTITIES			
ITEM NO.	DESCRIPTION	UNITS	QUANTITY
2511.507	RANDOM RIPRAP, CLASS 4	CY	148
2573.502	PROPOSED STORM DRAIN INLET PROTECTION	EACH	67
2573.501	STABILIZED CONSTRUCTION EXIT	EACH	1
2575.504	EROSION CONTROL BLANKET, CATEGORY 3N	SY	22,300
	PERIMETER CONTROL	LF	10,900
	CONCRETE WASHOUT AREA	EA	1

QUANTITIES ARE FOR INFORMATIONAL PURPOSES TO MEET THE REQUIREMENTS OF THE CONSTRUCTION STORMWATER PERMIT. NO GUARANTEE IS MADE TO THE ACTUAL QUANTITIES REQUIRED.

- RPBCWD STANDARD EROSION CONTROL NOTES (cont. from SWPPP Narrative Sheet)
- Natural topography and soil conditions must be protected, including retention onsite of native topsoil to the greatest extent possible.
 - Additional measures, such as hydraulic mulching and other practices as specified by the District must be used on slopes of 3:1 (H:V) or steeper to provide adequate stabilization.
 - Final site stabilization measures must specify that at least six inches of topsoil or organic matter with at least 5% organic content (shall meet RPBCWD topsoil definition) be spread and incorporated into the underlying soil during final site treatment wherever topsoil has been removed.
 - Construction site waste such as discarded building materials, concrete truck washout, chemicals, litter and sanitary waste must be properly managed.
 - All temporary erosion and sediment control BMPs must be maintained until completion of construction and vegetation is established sufficiently to ensure stability of the site, as determined by the District.
 - All temporary erosion and sediment control BMPs must be removed upon final stabilization.
 - Soil surfaces compacted during construction and remaining pervious upon completion of construction must be decompacted to achieve a soil compaction testing pressure of less than 1,400 kilopascals or 200 pounds per square inch in the upper 12 inches of the soil profile while taking care to protect utilities, tree roots, and other existing vegetation.
 - Infiltration facilities must not be excavated to within 3-ft of final grade until contributing drainage area has been constructed and fully stabilized. Any accumulated sediment in an infiltration facility must be removed in a manner that prevents compaction of the facility bottom. To provide a well-aerated, highly porous surface, the soils below an infiltration practice must be loosened to a minimum depth of 18" prior to installation or planting.
 - All disturbed areas must be stabilized within 7 calendar days after land-disturbing work has temporarily or permanently ceased on a property that drains to an impaired water, within 14 days elsewhere.
 - The permittee must, at a minimum, inspect, maintain and repair all disturbed surfaces and all erosion and sediment control facilities and soil stabilization measures every day work is performed on the site and at least weekly until land-disturbing activity has ceased. Thereafter, the permittee must perform these responsibilities at least weekly until vegetative cover is established. The permittee will maintain a log of activities under this section for inspection by the District on request.
 - For any in water work, potential transfer of aquatic species (e.g. zebra mussels, Eurasian watermilfoil, etc.) shall be minimized to the maximum extent possible.
 - After inspection of all erosion prevention, sediment control facilities, and soil stabilization, the contractor shall repair, replace or supplement all non-functional BMPs with functional BMPs within 48 hours of discovery and prior to the next rainfall event or as soon as possible. When active land-disturbing activities are not underway, inspection and these responsibilities shall take place weekly until vegetative cover is established. Also a log of inspection and repair activities shall be maintained and available per request of the watershed district (RBPCWD).



EROSION CONTROL LEGEND	
SYMBOL	DESCRIPTION
	RANDOM RIPRAP, CLASS __
	PERIMETER CONTROL
	STORM DRAIN INLET PROTECTION
	STABILIZED CONSTRUCTION EXIT
	EROSION CONTROL BLANKET, CATEGORY __
	CONCRETE WASHOUT AREA
	EXISTING DRAINAGE ARROW
	PROPOSED DRAINAGE ARROW
	EXISTING CONTOUR (MINOR INTERVAL)
	EXISTING CONTOUR (MAJOR INTERVAL)
	PROPOSED CONTOUR (MINOR INTERVAL)
	PROPOSED CONTOUR (MAJOR INTERVAL)
PERIMETER CONTROL CAN BE SILT FENCE OR SEDIMENT CONTROL LOG. SEE SITE RESTORATION PLAN FOR FINAL TURF ESTABLISHMENT. NOTE: SWPPP COVERAGE INCLUDES ELECTRIC, GAS, TELEPHONE, AND CABLE INSTALLATION. EACH COMPANY OR THEIR SUBCONTRACTOR IS RESPONSIBLE TO FOLLOW THE REQUIREMENTS OF THIS SWPPP INCLUDING PROVIDING THEIR OWN RESTORATION IF INSTALLATION OCCURS AFTER PRIMARY INSTALLATION OF SEEDING/SODDING/MULCHING DURING CONSTRUCTION OF EACH UTILITY.	

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JEREMY D. FOSS

DATE: _____ LIC. NO. 55871

PROJECT

LENNAR

RESERVE AT

AUTUMN WOODS

CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	21-24984
FILE NAME	24984 SWPPP
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

TITLE

PROPOSED SWPPP

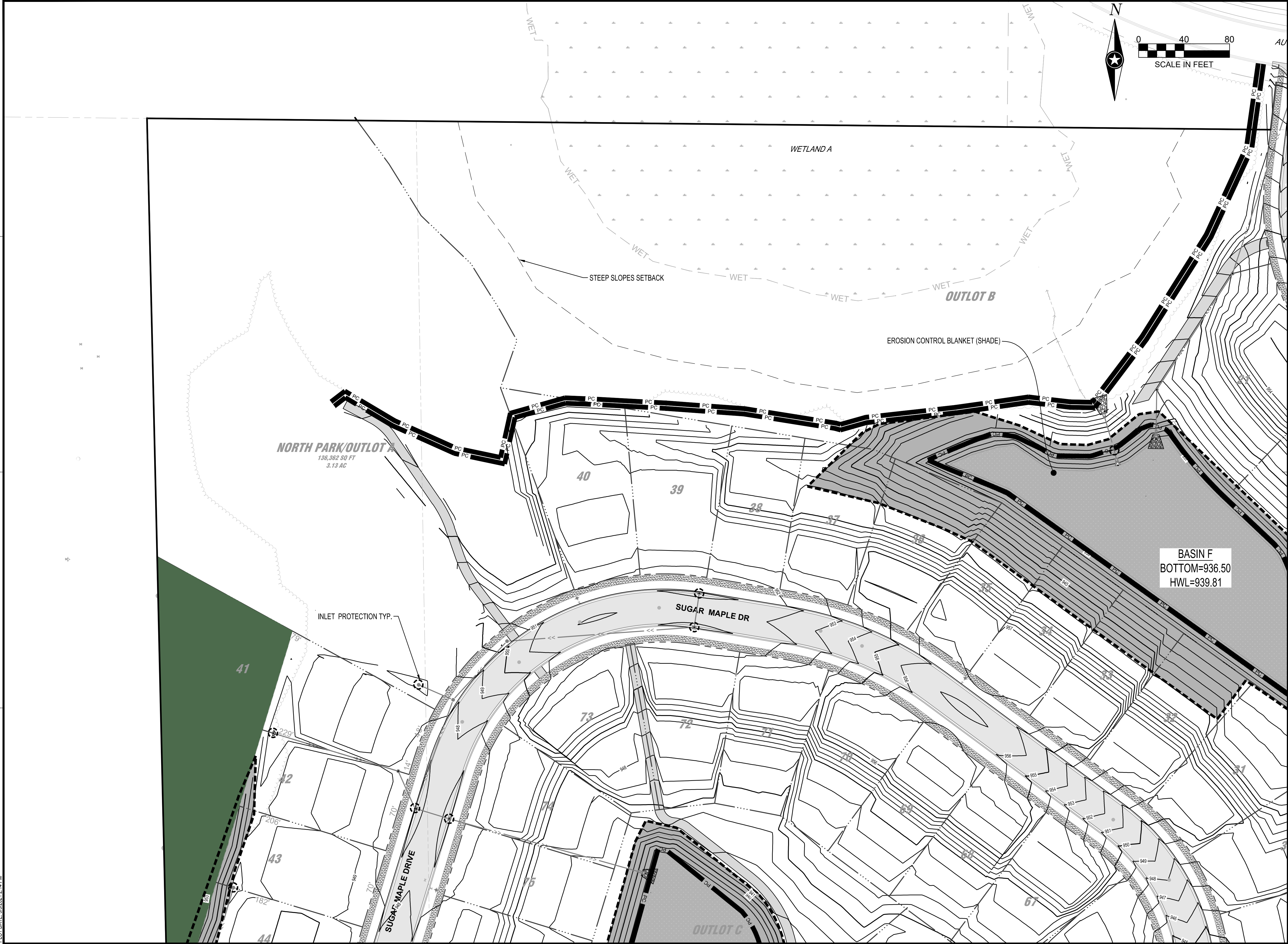
(OVERALL)

SHEET

13

OF 47

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PROJECT

**LENNAR
RESERVE AT
AUTUMN WOODS**

CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

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CLIENT PROJECT NO.	-

TITLE
**PROPOSED SWPPP
(NW)**

SHEET
14
OF 47

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AUTUMN WOODS**

CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

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FILE NAME	24984 SWPPP
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DESIGNED BY	JRS
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CLIENT PROJECT NO.	-

TITLE
**PROPOSED SWPPP
(NE)**

SHEET
15
OF 47

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PROJECT

**LENNAR
RESERVE AT
AUTUMN WOODS**

CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	21-24984
FILE NAME	24984 SWPPP
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

TITLE
**PROPOSED SWPPP
(SW)**

SHEET
16
OF 47

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CHASKA MINNESOTA

REVISION SCHEDULE		
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ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

TITLE

**PROPOSED SWPPP
(SE)**

SHEET

17

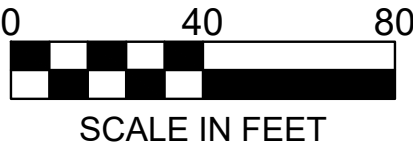
OF 47

BENCHMARK HYDRANT
T.N.F.H. = 940.33

INLET PROTECTION TYP.

EROSION CONTROL BLANKET,
TYP. (SHADE)

N



SUGAR MAPLE DRIVE

IRONWOOD BLVD.

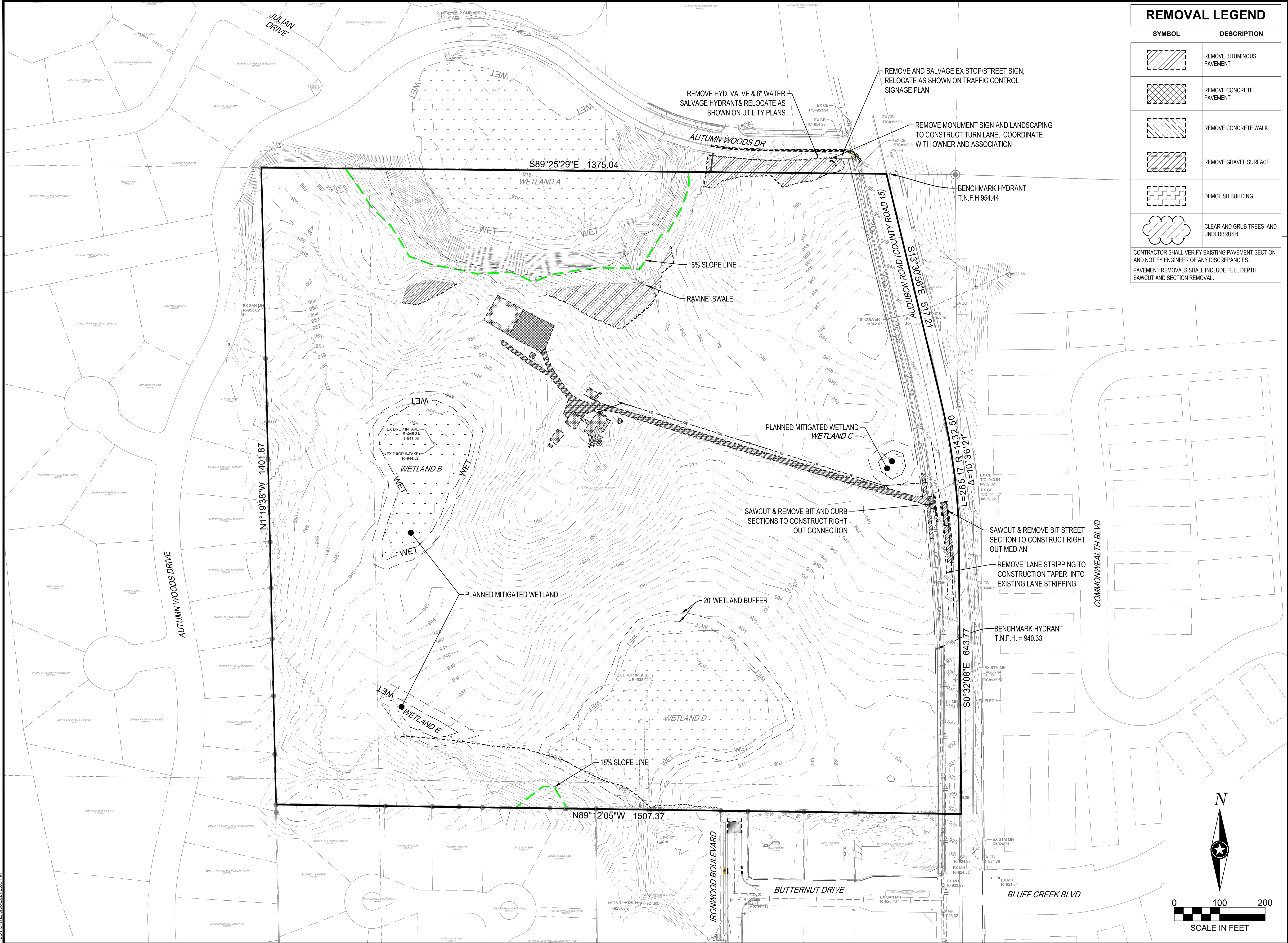
BASIN C
BOTTOM=926.00
NWL = 931.00
HWL = 933.35

OUTLOT D
WETLAND D
NWL = 929.00
HWL = 932.37

BASIN A
BOTTOM = 930.50
HWL = 932.56

BASIN B
BOTTOM=931.00
HWL = 932.72

OUTLOT E



REMOVAL LEGEND	
SYMBOL	DESCRIPTION
	REMOVE BITUMINOUS PAVEMENT
	REMOVE CONCRETE PAVEMENT
	REMOVE CONCRETE WALK
	REMOVE GRAVEL SURFACE
	DEMOLISH BUILDING
	CLEAR AND GRUB TREES AND UNDERBRUSH
CONTRACTOR SHALL VERIFY EXISTING PAVEMENT SECTION AND NOTIFY ENGINEER OF ANY DISCREPANCIES. PAVEMENT REMOVALS SHALL INCLUDE FULL DEPTH SAWCUT AND SECTION REMOVAL.	



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PROJECT

LENNAR RESERVE AT AUTUMN WOODS

CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	21-24984
FILE NAME	24984 EXIST
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

EXISTING SITE AND REMOVAL PLAN

SHEET

18



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PROJECT

LENNAR
RESERVE AT
AUTUMN WOODS

CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	21-24984
FILE NAME	24984 SITE
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

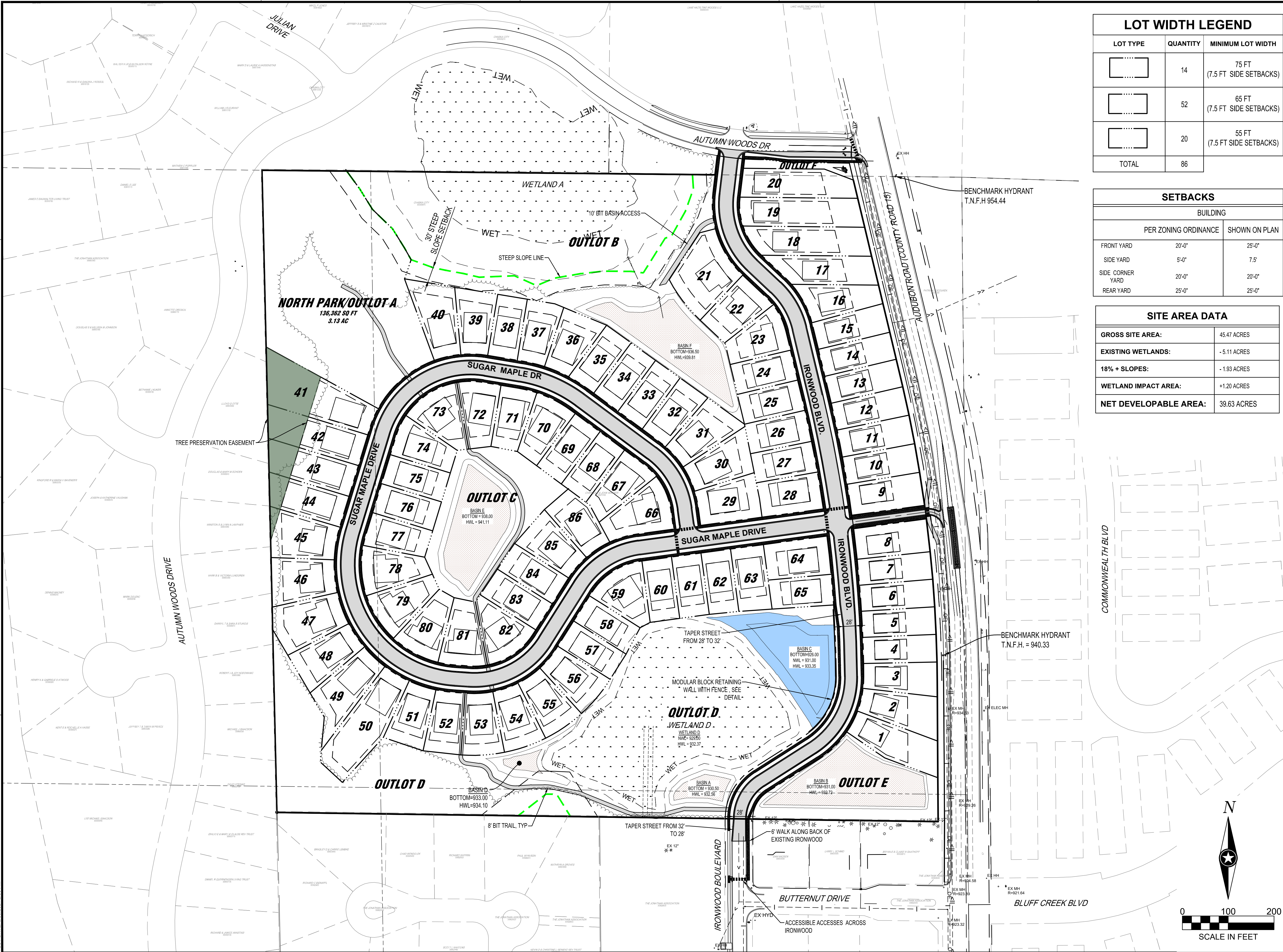
OVERALL SITE
PLAN

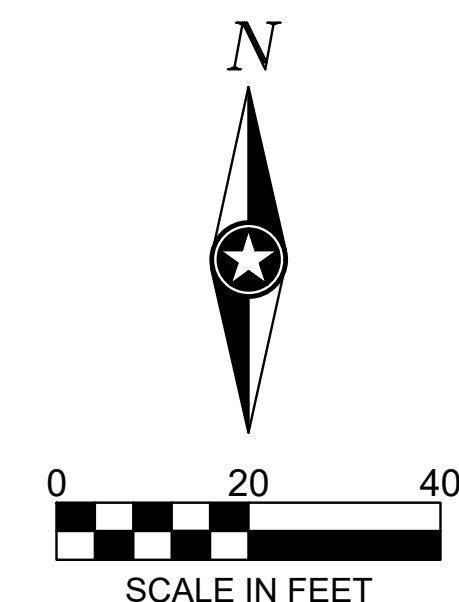
SHEET
19 OF 47

LOT WIDTH LEGEND		
LOT TYPE	QUANTITY	MINIMUM LOT WIDTH
	14	75 FT (7.5 FT SIDE SETBACKS)
	52	65 FT (7.5 FT SIDE SETBACKS)
	20	55 FT (7.5 FT SIDE SETBACKS)
TOTAL	86	

SETBACKS		
BUILDING		
PER ZONING ORDINANCE		SHOWN ON PLAN
FRONT YARD	20'-0"	25'-0"
SIDE YARD	5'-0"	7.5'
SIDE CORNER YARD	20'-0"	20'-0"
REAR YARD	25'-0"	25'-0"

SITE AREA DATA	
GROSS SITE AREA:	45.47 ACRES
EXISTING WETLANDS:	- 5.11 ACRES
18% + SLOPES:	- 1.93 ACRES
WETLAND IMPACT AREA:	+1.20 ACRES
NET DEVELOPABLE AREA:	39.63 ACRES





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PROJECT

LENNAR

**RESERVE AT
AUTUMN WOODS**

CHASKA MINNESOTA

[illegible]

PROJECT NO.	21-24984
FILE NAME	24984 SITE
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

TITLE

**AUTUMN WOODS
DR. PROPOSED
IMPROVEMENTS**

SHEET

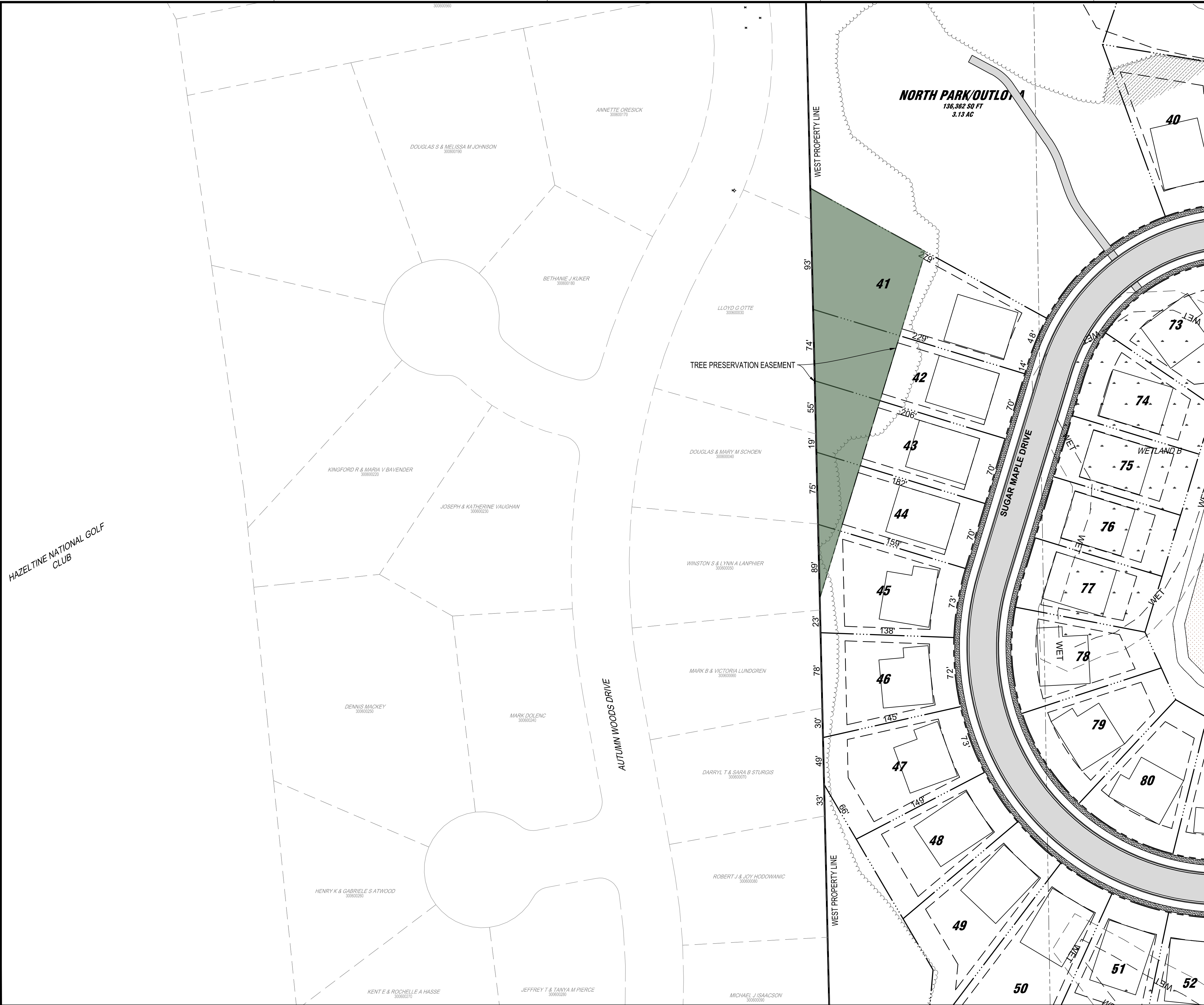
20

OF 47

PRELIMINARY NOT FOR CONSTRUCTION PRELIMINARY NOT FOR CONSTRUCTION

HAZELTINE NATIONAL GOLF CLUB

PLOT DATE: 7/26/2021 1:48 PM



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PROJECT

LENNAR RESERVE AT AUTUMN WOODS

CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	21-24984
FILE NAME	24984 LOT EXHIBIT
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

TITLE

WEST PROPERTY LOT COMPARISON EXHIBIT

SHEET

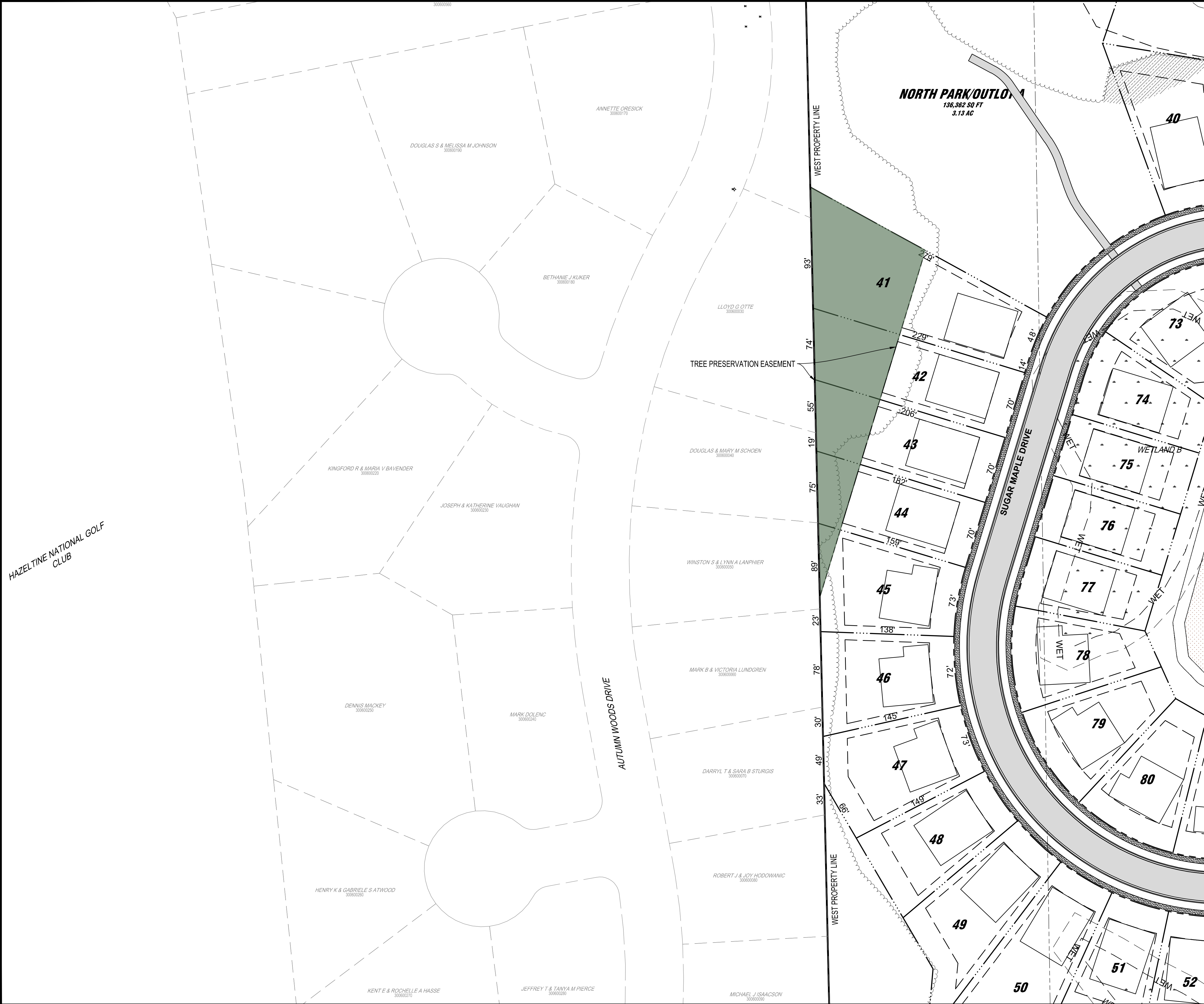
21A

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HAZELTINE NATIONAL GOLF CLUB

PLT DATE: 7/26/2021 1:48 PM



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PROJECT

**LENNAR
RESERVE AT
AUTUMN WOODS**

CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	21-24984
FILE NAME	24984 LOT EXHIBIT
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

TITLE

**WEST PROPERTY
LOT COMPARISON
EXHIBIT**

SHEET

21A

OF 2

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**LENNAR
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AUTUMN WOODS**

CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	21-24984
FILE NAME	24984 UTILITIES
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

TITLE

**UTILITY PLAN
(OVERALL)**

SHEET

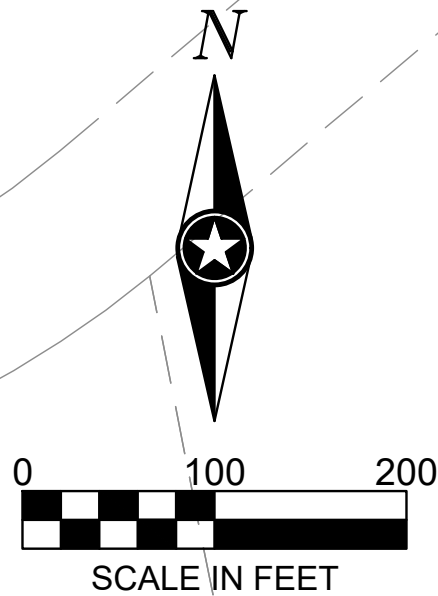
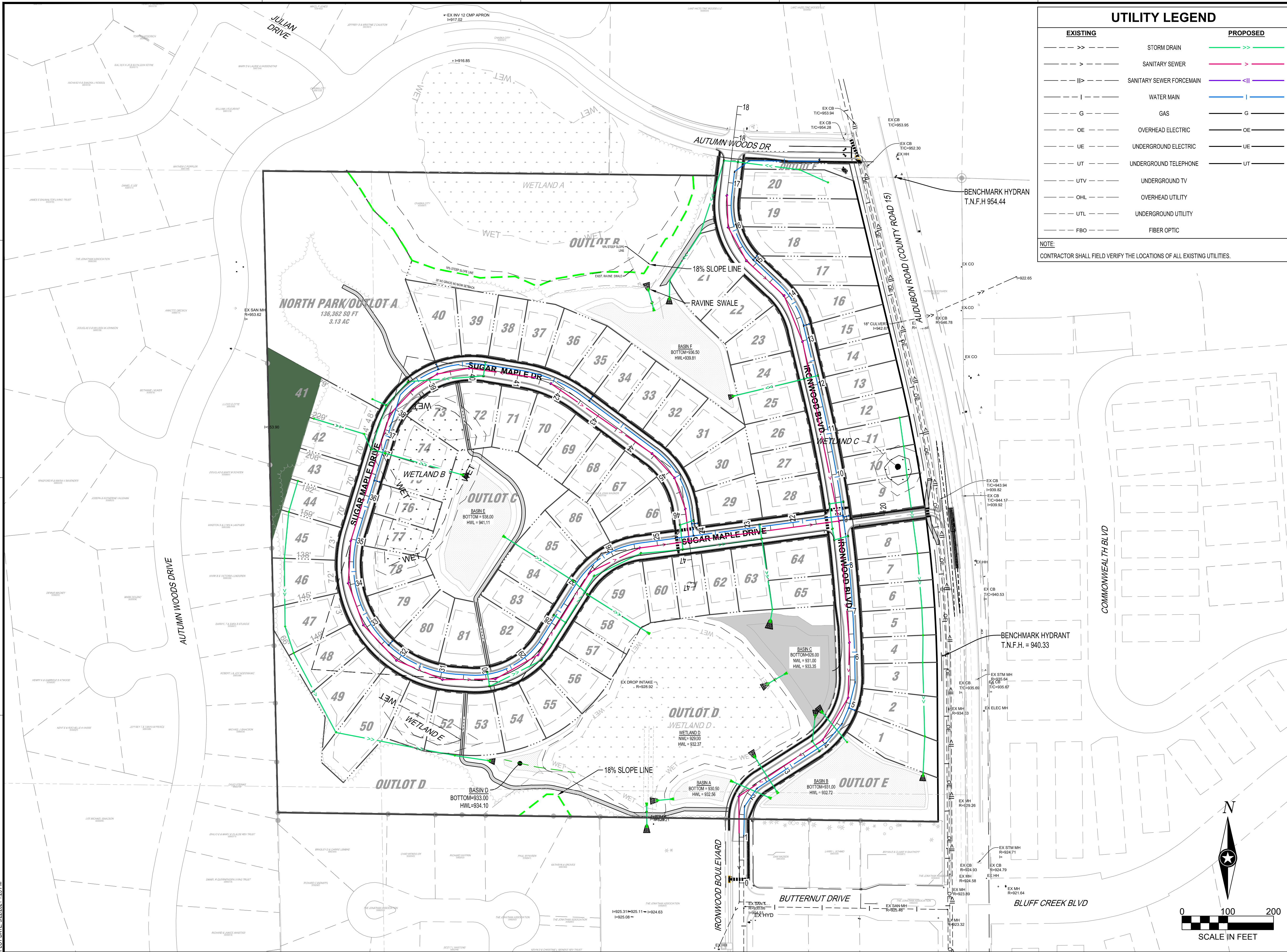
22

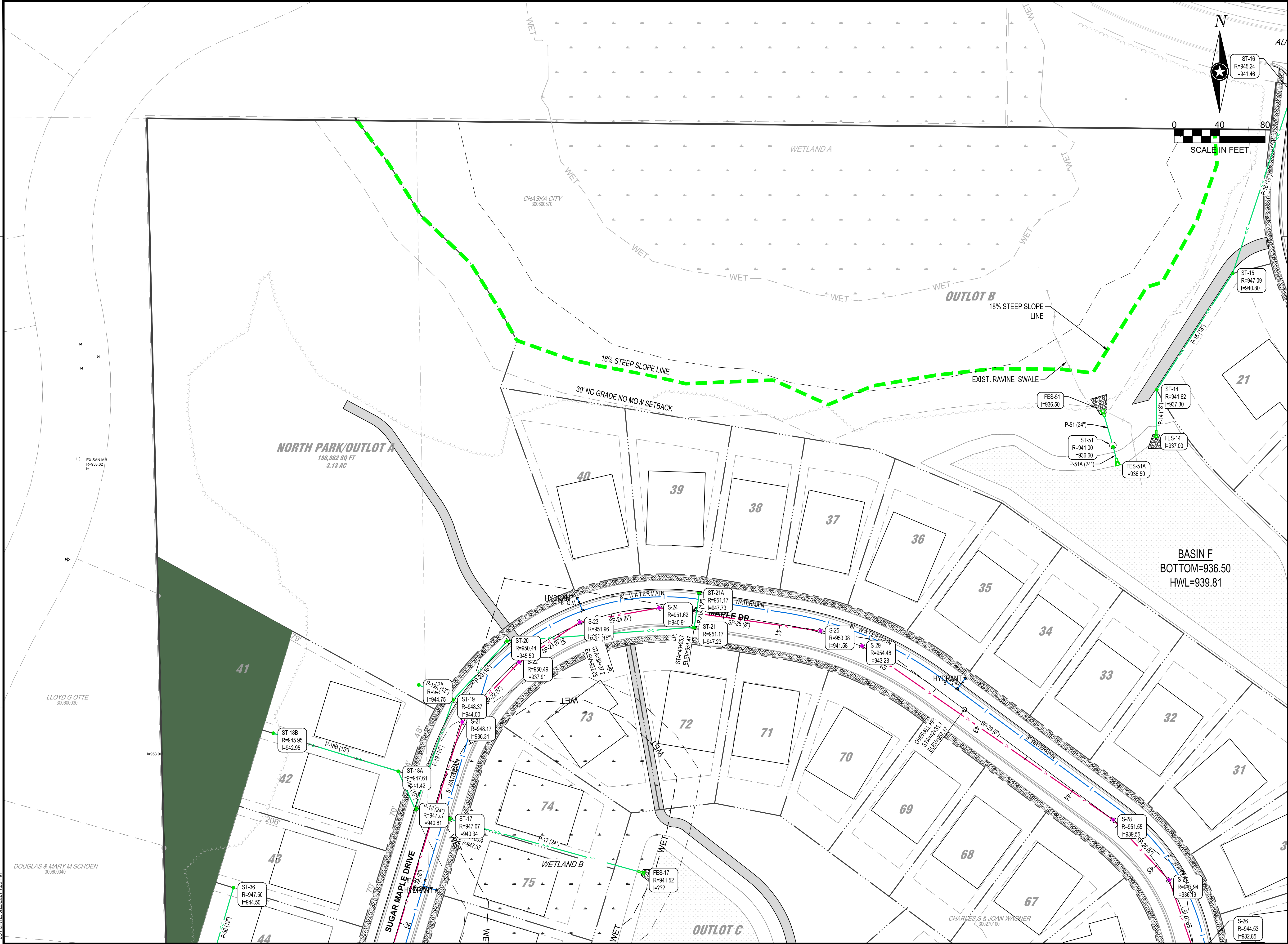
OF 47

UTILITY LEGEND

EXISTING		PROPOSED
-- >> --	STORM DRAIN	-- >> --
-- > --	SANITARY SEWER	-- > --
-- > --	SANITARY SEWER FORCEMAIN	-- < --
-- --	WATER MAIN	-- --
-- G --	GAS	-- G --
-- OE --	OVERHEAD ELECTRIC	-- OE --
-- UE --	UNDERGROUND ELECTRIC	-- UE --
-- UT --	UNDERGROUND TELEPHONE	-- UT --
-- UTV --	UNDERGROUND TV	
-- OHL --	OVERHEAD UTILITY	
-- UTL --	UNDERGROUND UTILITY	
-- FBO --	FIBER OPTIC	

NOTE:
CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS OF ALL EXISTING UTILITIES.





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PROJECT

**LENNAR
RESERVE AT
AUTUMN WOODS**

CHASKA MINNESOTA

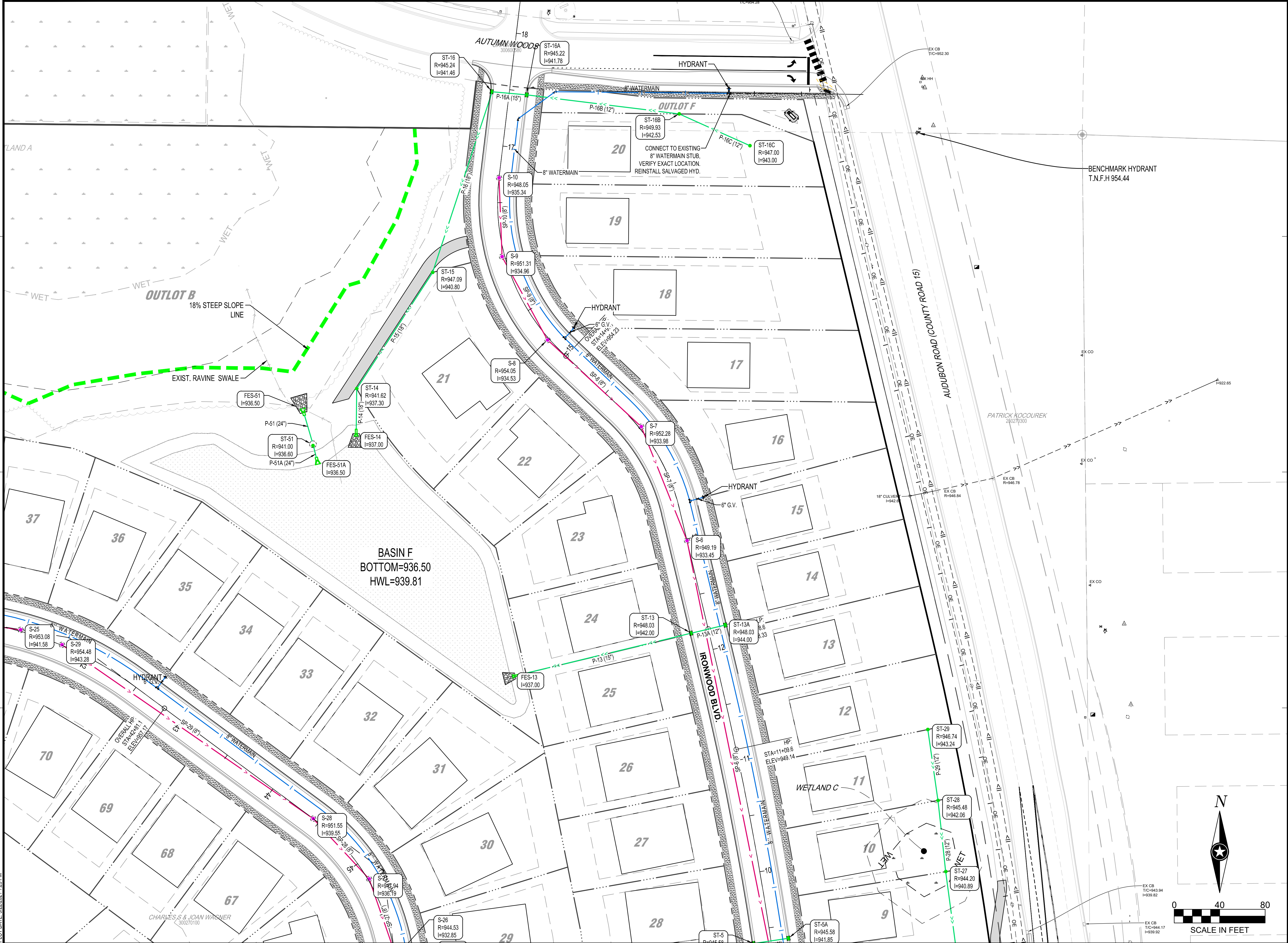
REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	21-24984
FILE NAME	24984 UTILITES
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

**UTILITY PLAN
(NW)**

SHEET
23
OF 47

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PROJECT

LENNAR RESERVE AT AUTUMN WOODS

CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	21-24984
FILE NAME	24984 UTILITIES
DRAWN BY	JRS
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ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

TITLE

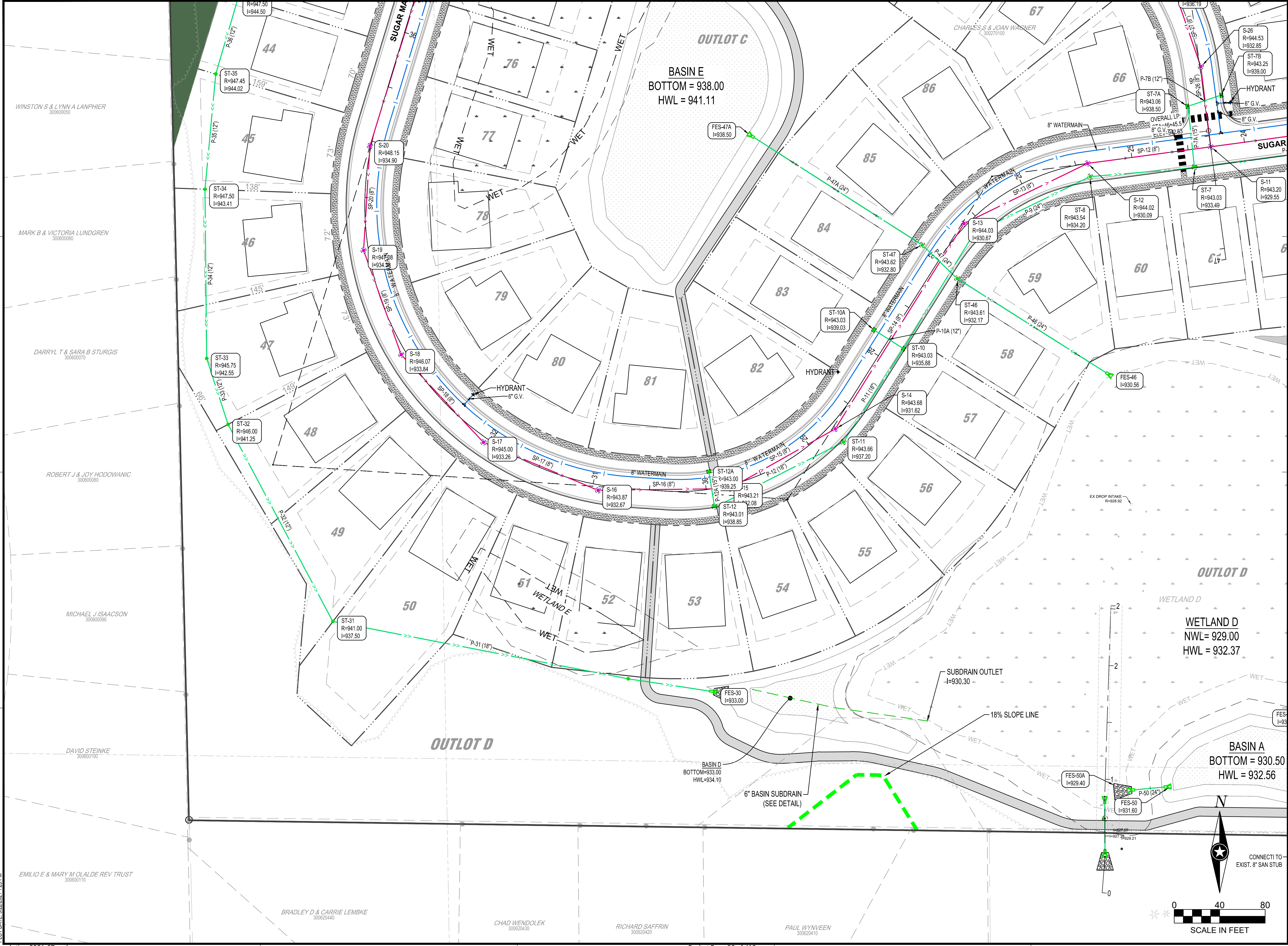
UTILITY PLAN (NE)

SHEET

24

OF 47

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PROJECT

LENNAR
RESERVE AT
AUTUMN WOODS

CHASKA MINNESOTA

REVISION SCHEDULE		
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CLIENT PROJECT NO.	-

TITLE

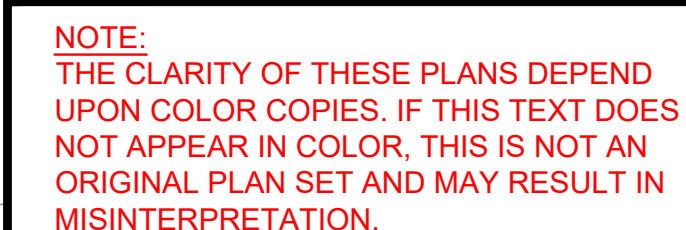
UTILITY PLAN (SW)

SHEET

25

OF 47

PRELIMINARY NOT FOR CONSTRUCTION PRELIMINARY NOT FOR CONSTRUCTION PRELIMINARY NOT FOR CONSTRUCTION



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DATE _____ LIC. NO. 55871

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PROJECT

LENNAR

RESERVE AT AUTUMN WOODS

CHASKA MINNESOTA

[illegible]

PROJECT NO.	21-24984
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FILE NAME	24984 UTILITES
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DRAWN BY JRS

DESIGNED BY	JRS
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REVIEWED BY JDF

CLIENT PROJECT NO. _____

TITL E

UTILITY PLAN (SE)

SHEET

26

OF 47



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PROJECT

**LENNAR
RESERVE AT
AUTUMN WOODS**

CHASKA MINNESOTA

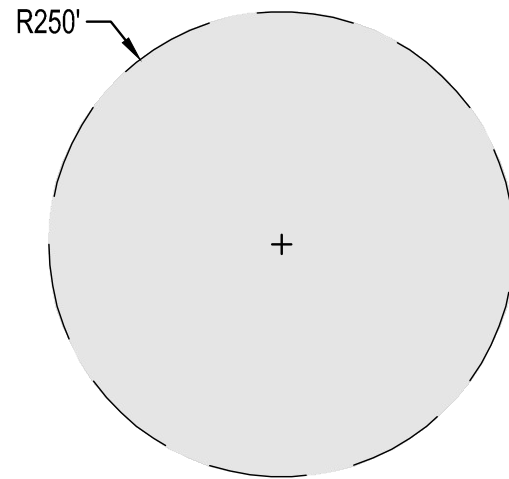
REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	21-24984
FILE NAME	24984 HYD
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

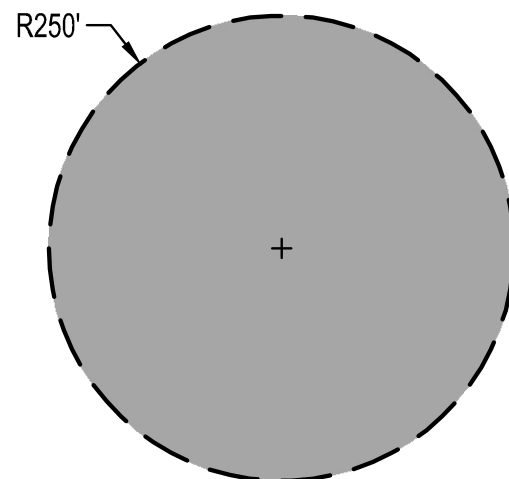
TITLE
**HYDRANT
COVERAGE MAP**

SHEET
27
OF 47

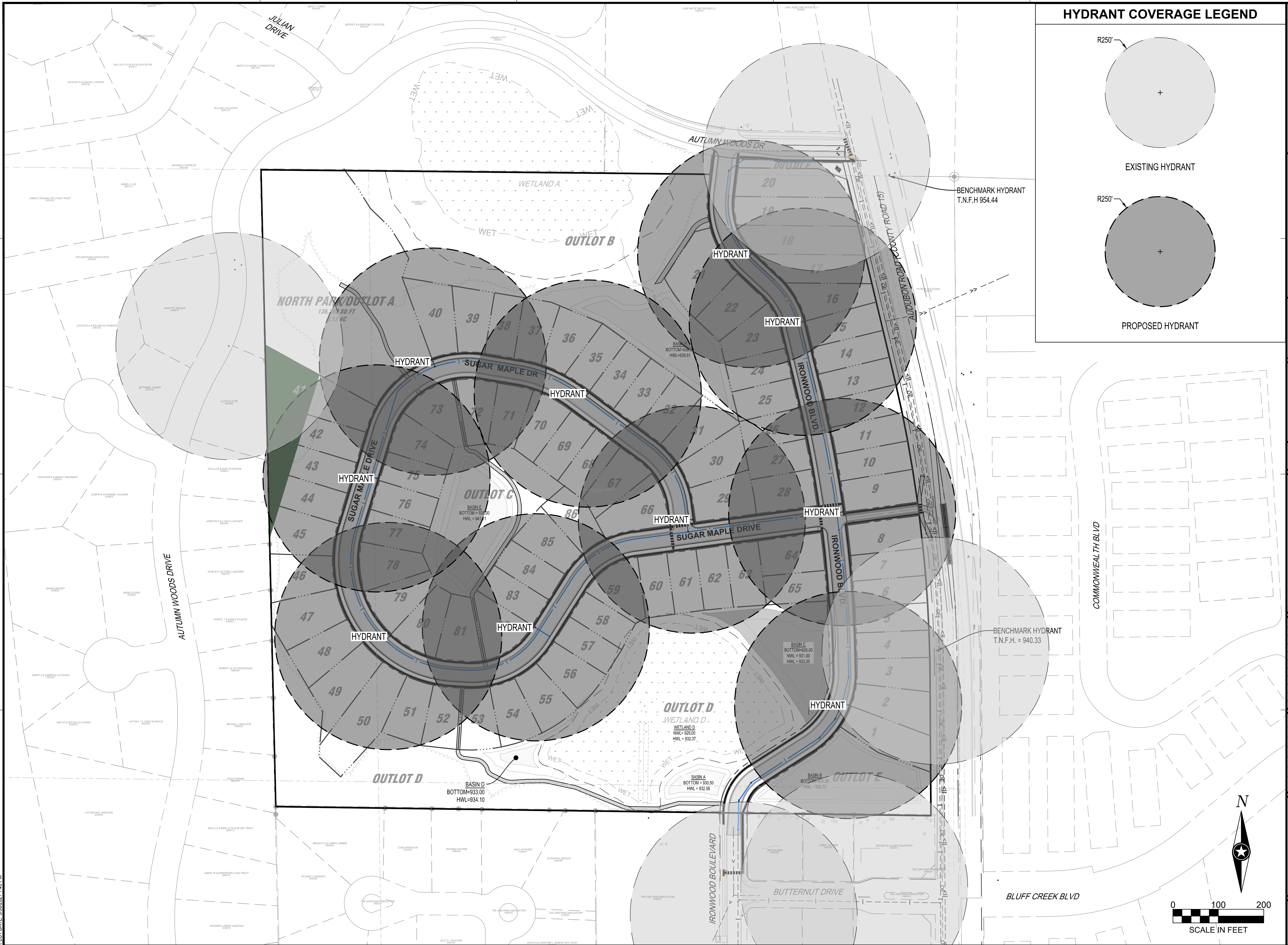
HYDRANT COVERAGE LEGEND



EXISTING HYDRANT



PROPOSED HYDRANT





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LENNAR
RESERVE AT
AUTUMN WOODS

CHASKA MINNESOTA

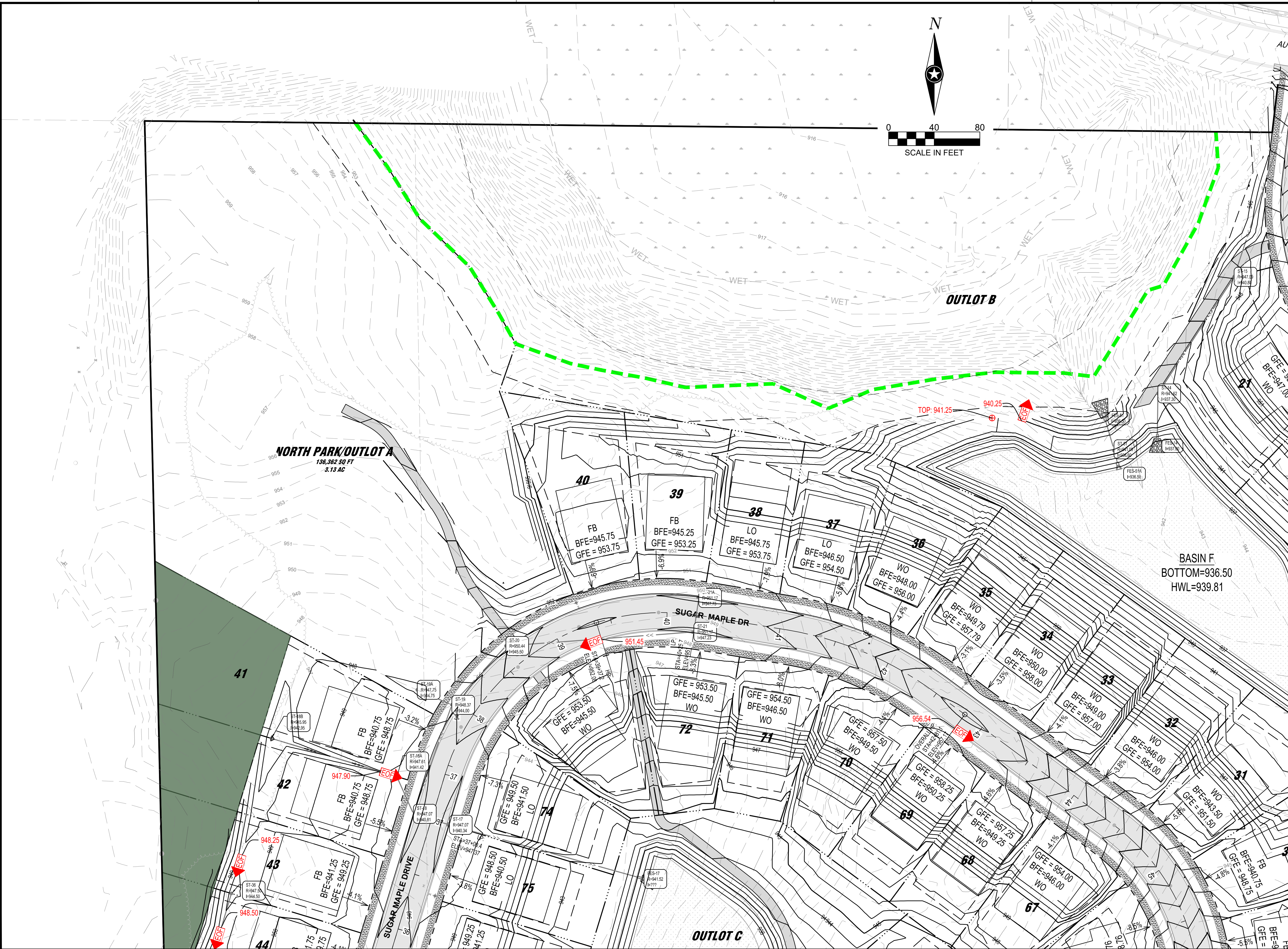
REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	21-24984
FILE NAME	24984 GRADE
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

TITLE
**GRADING PLAN
(OVERALL)**

SHEET
28
OF 47





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JEREMY D. FOSS

DATE: _____ LIC. NO. 55871

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PROJECT

LENNAR
RESERVE AT
AUTUMN WOODS

CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	21-24984
FILE NAME	24984 GRADE
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

TITLE
GRADING PLAN
(NW)

SHEET
29
OF 47

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PROJECT

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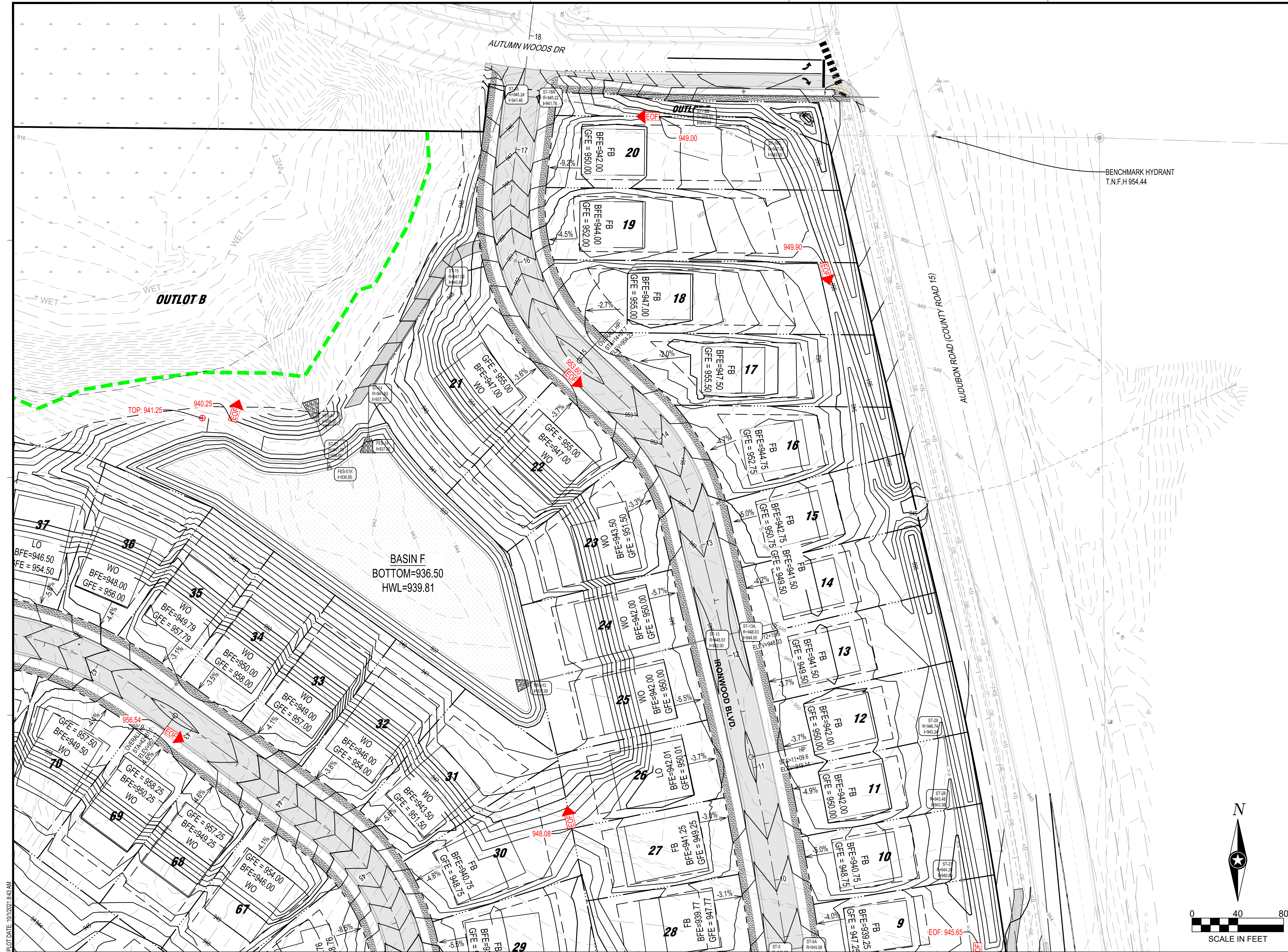
CHASKA MINNESOTA

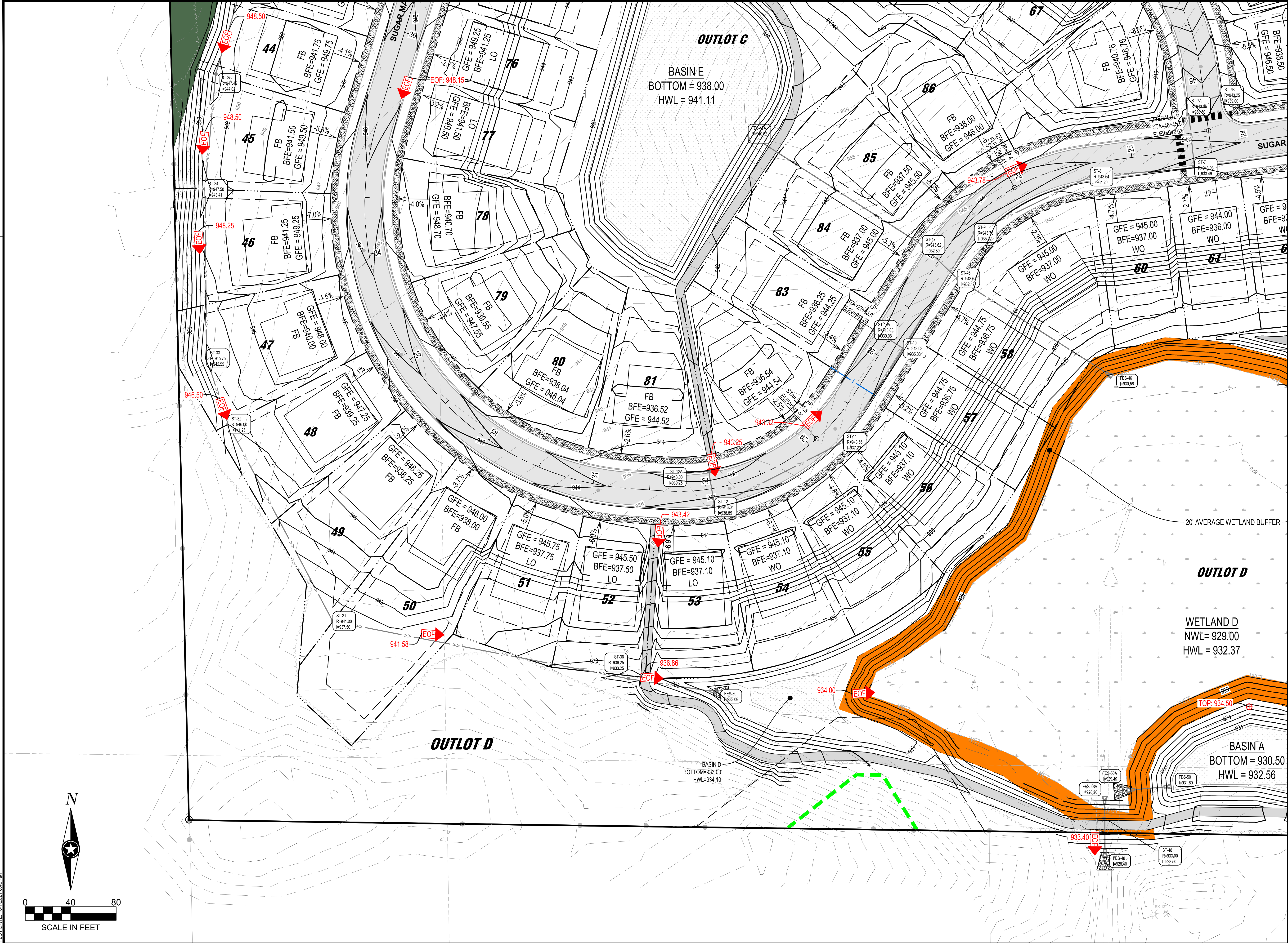
REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO. 21-24984
FILE NAME 24984 GRADE
DRAWN BY JRS
DESIGNED BY JRS
REVIEWED BY JDF
ORIGINAL ISSUE DATE 07/06/21
CLIENT PROJECT NO. -

TITLE
GRADING PLAN
(NE)

SHEET
30 OF 47





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PROJECT

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CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	21-24984
FILE NAME	24984 GRADE
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

TITLE

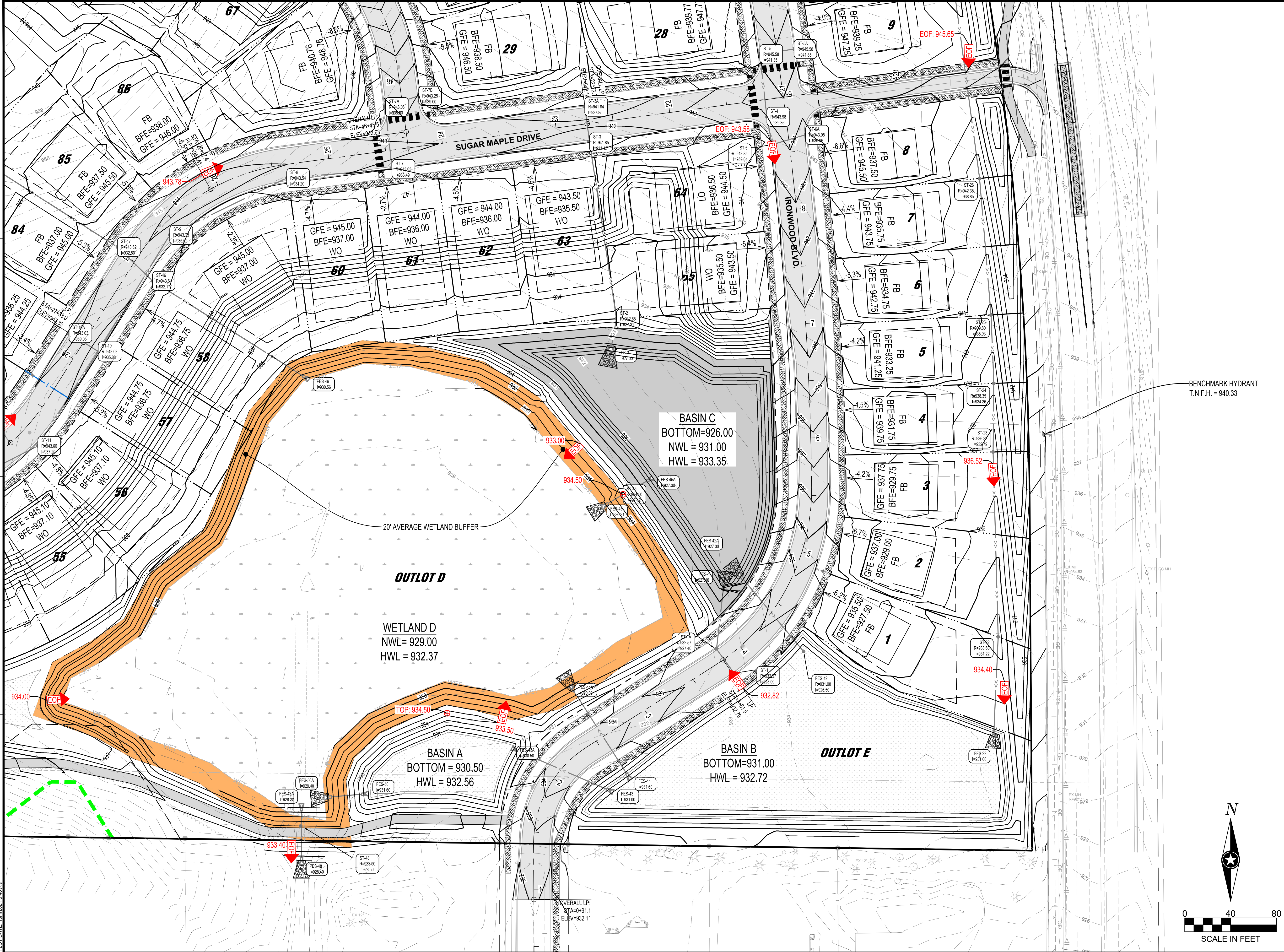
GRADING PLAN
(SW)

SHEET

31

OF 47

PRELIMINARY NOT FOR CONSTRUCTION PRELIMINARY NOT FOR CONSTRUCTION PRELIMINARY NOT FOR CONSTRUCTION



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PROJECT

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RESERVE AT
AUTUMN WOODS

CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	21-24984
FILE NAME	24984 GRADE
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

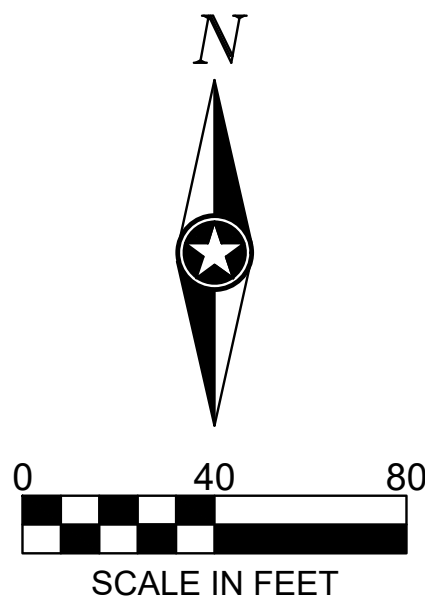
TITLE

GRADING PLAN
(SE)

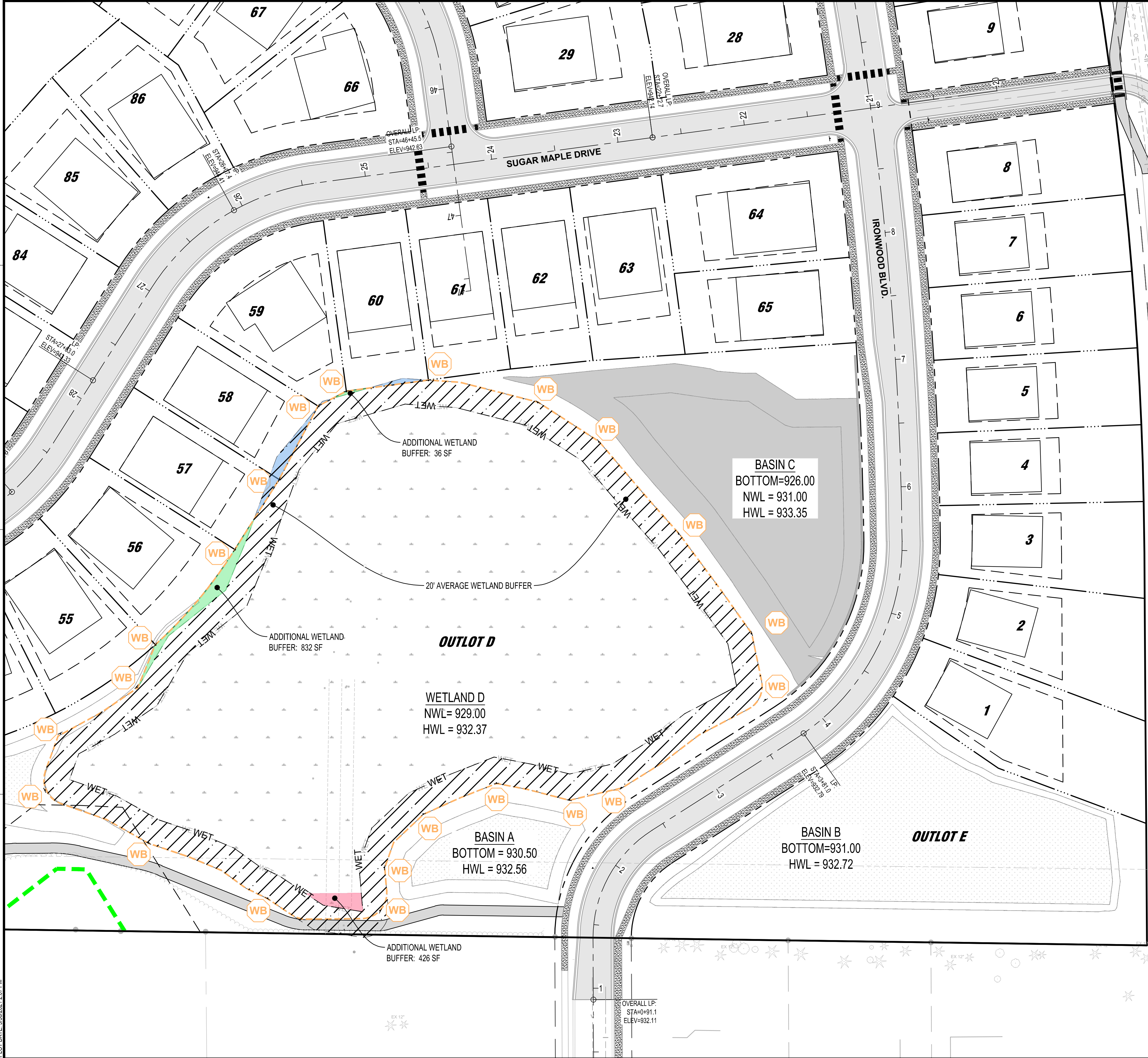
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PROJECT

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AUTUMN WOODS**

CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO. 21-24984
FILE NAME 24984 WETLAND
DRAWN BY JRS
DESIGNED BY JRS
REVIEWED BY JDF
ORIGINAL ISSUE DATE 07/06/21
CLIENT PROJECT NO. -

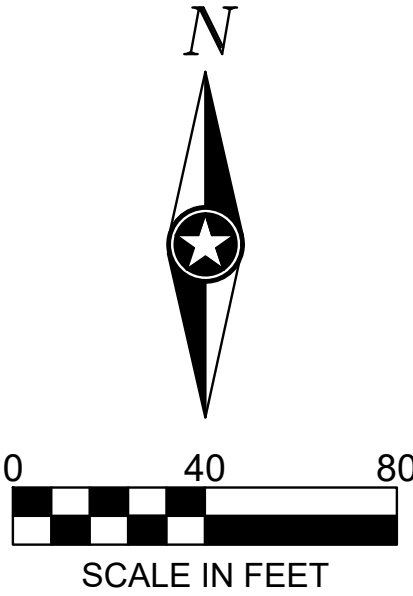
TITLE
**WETLAND BUFFER
AND SIGNAGE**

SHEET

33

OF 47

WETLAND LEGEND	
	WETLAND IMPACT AREA (426 SF / 0.01 AC)
	REQUIRED AVERAGE WETLAND BUFFER (29,863 SF / 0.69 AC)
	POTENTIAL EXCESS WETLAND BUFFER AREA (868 SF / 0.02 AC)
	AVERAGE BUFFER AREA NOT IN COMPLIANCE (615 SF / 0.014 AC)
	WETLAND BUFFER
	WETLAND BUFFER SIGN, TO BE PLACED AT PROPERTY LINE OR BUFFER EDGE (PER WATERSHED DISTRICT REQUIREMENTS)



BENCHMARK HYDRANT
T.N.F.H. = 940.33

BASIN C
BOTTOM=926.00
NWL = 931.00
HWL = 933.35

WETLAND D
NWL= 929.00
HWL = 932.37

BASIN A
BOTTOM = 930.50
HWL = 932.56

BASIN B
BOTTOM=931.00
HWL = 932.72

ADDITIONAL WETLAND
BUFFER: 36 SF

ADDITIONAL WETLAND
BUFFER: 832 SF

ADDITIONAL WETLAND
BUFFER: 426 SF

OUTLOT D

OUTLOT E

SUGAR MAPLE DRIVE

IRONWOOD BLVD.

9.B. Adopt Resolution 2021-67 and...



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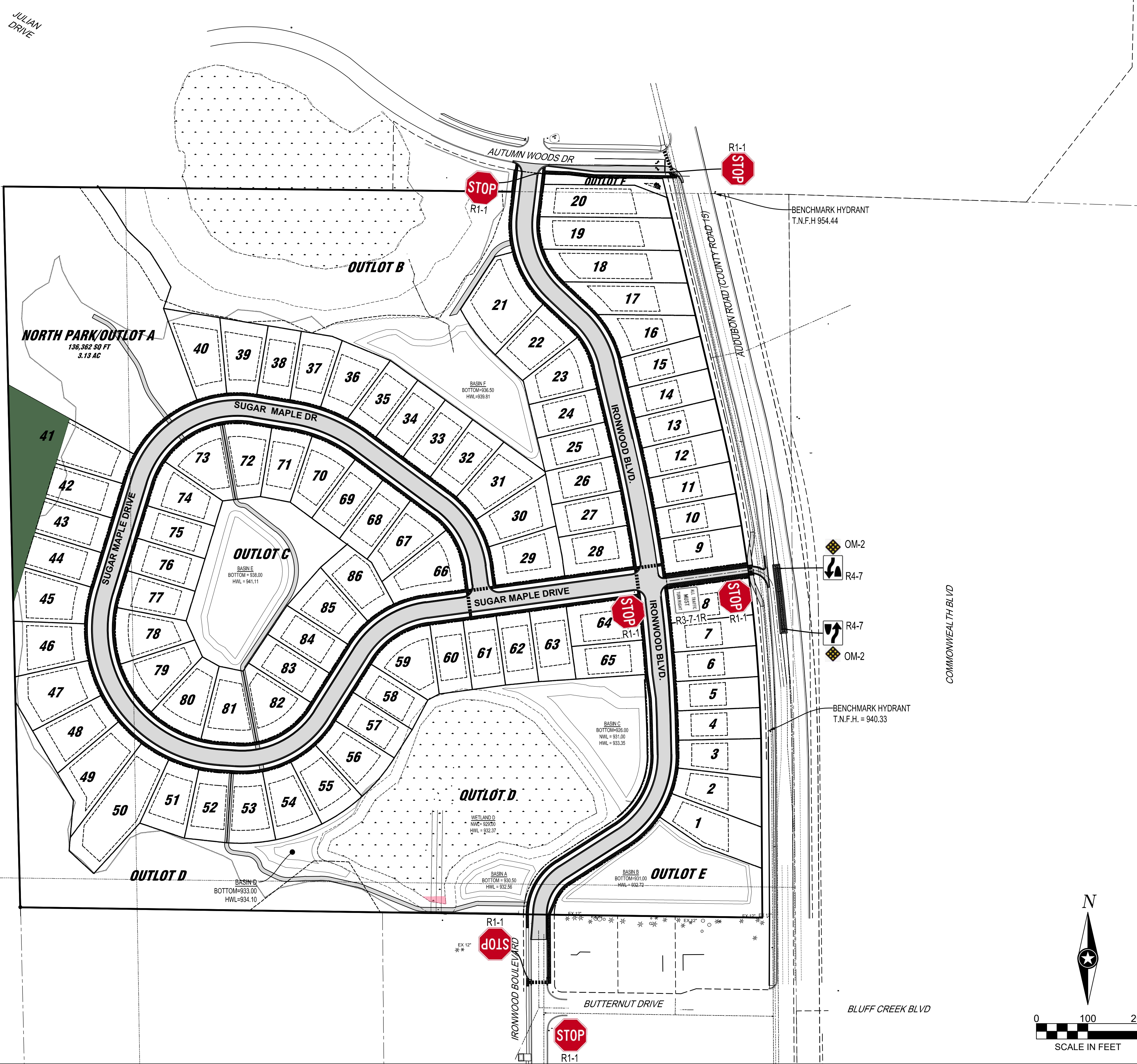
CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

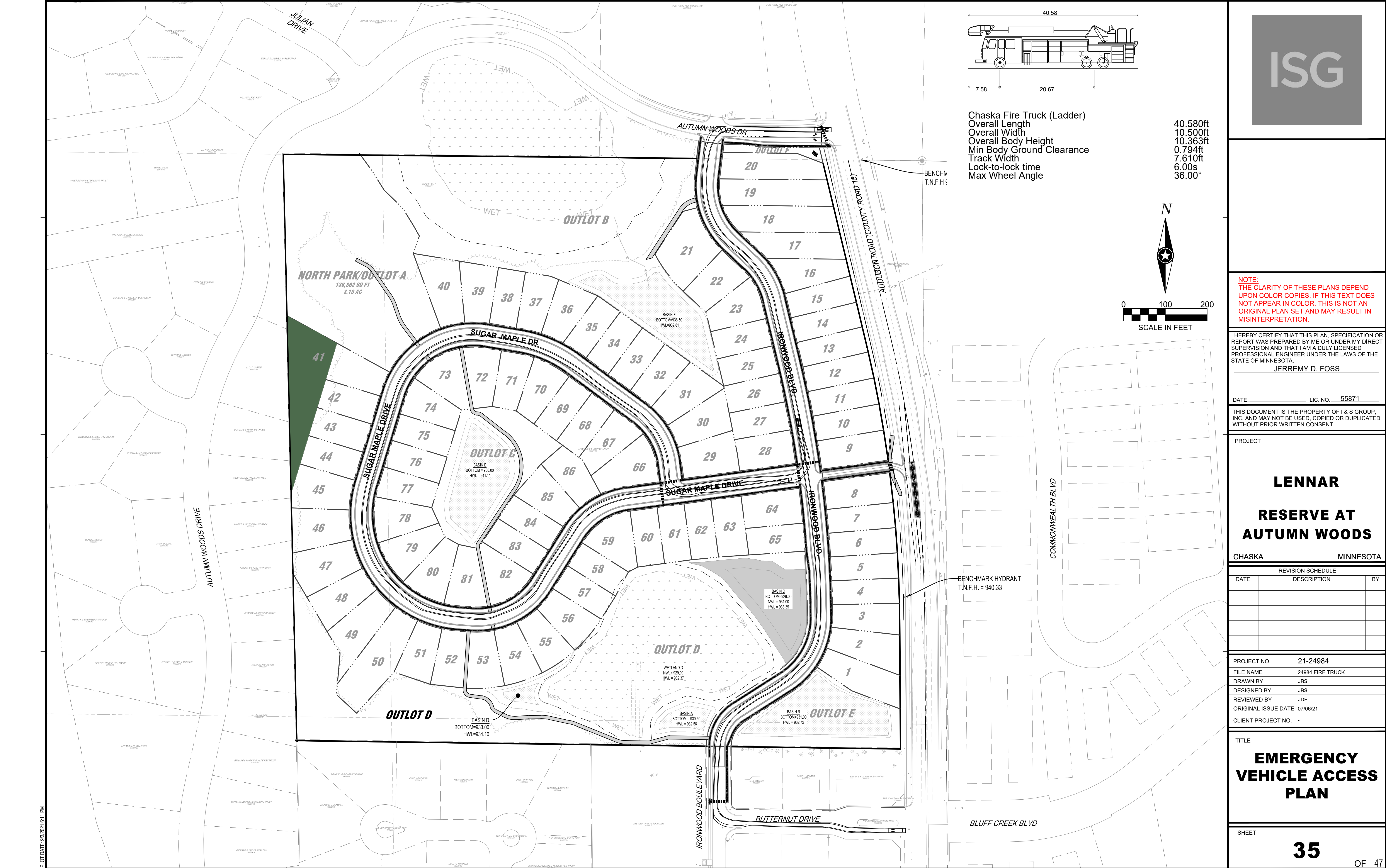
PROJECT NO.	21-24984
FILE NAME	24984 SIGNAGE
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

TITLE
TRAFFIC CONTROL
PLAN (SIGNAGE)

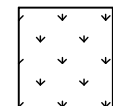
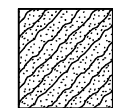
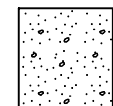
SHEET
34 OF 46

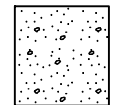
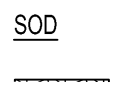


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RESTORATION SCHEDULE

SEED MIX	QTY	BOTANICAL / COMMON NAME
	550,905 SF	LOW MAINTENANCE TURF (MN DOT 25-131)
	128,331 SF	MESIC PRAIRIE GENERAL (MNDOT 35-241)
	100,903 SF	STORMWATER SOUTH AND WEST (MNDOT 33-261)

	100,903 SF	STORMWATER SOUTH AND WEST (MNDOT 33-261)
		

CODE REQUIREMENTS SUMMARY

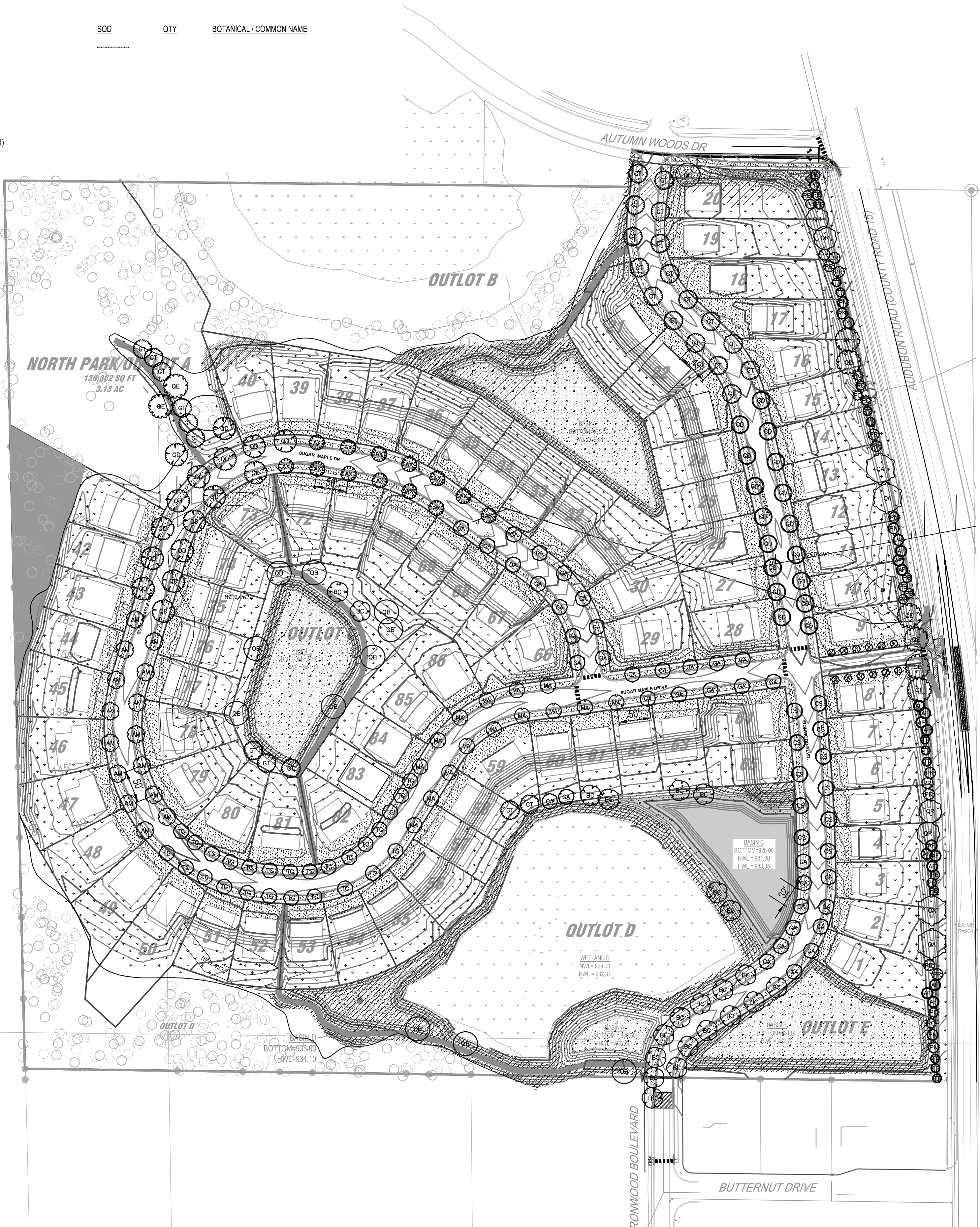
STREET TREES REQUIREMENTS:
1 OVERSTORY TREE ON EACH SIDE OF THE STREET FOR EVERY 50 FEET OF CENTERLINE.
9,370 LF / 50 = (188) TREES
• TREES REQUIRED = 188
• TREES PROVIDED = 188

SCREEN REQUIREMENTS:
BERM REQUIRED ALONG ARTERIALS AND COLLECTORS WITH PLANT MATERIAL TO PROVIDE A VISUAL SCREEN.
• TREES PROVIDED FOR SCREENING: 76

EXISTING TREES:
• (722) SURVEYED TREES MEETING ORDINANCE THRESHOLD
• (148) TOTAL PROPOSED REMOVALS

SIGNIFICANT TREES:
• (262) TOTAL TREES
• (46) PROPOSED REMOVALS, (7) OF WHICH ARE DEAD

SOD REQUIRED IN RIGHT-OF-WAY AND IN FRONT YARDS.
SOD TO BE PLACED BY BUILDER WITH HOME CONSTRUCTION



PLANT SCHEDULE

EVERGREEN TREES	QTY	BOTANICAL / COMMON NAME	SIZE	ROOT
	14	ABIES FRASERI FRASER FIR	6' HT MIN	B & B
	11	PICEA GLAUCA DENSATA BLACK HILLS SPRUCE	6' HT MIN	B & B
	8	PICEA PUNGENS COLORADO SPRUCE	6' HT MIN	B & B
	8	PINUS NIGRA AUSTRIAN PINE	6' HT MIN	B & B
	11	PINUS RESINOSA RED PINE	6' HT MIN	B & B
	10	THUJA OCCIDENTALIS 'TECHNY' TECHNY ARBORVITAE	6' HT MIN	B & B
OVERSTORY TREES	QTY	BOTANICAL / COMMON NAME	SIZE	ROOT
	15	ACER X FREEMANII 'FIREFALL' FIREFALL MAPLE	2.5' CAL	B & B
	13	AESCULUS X 'AUTUMN SPLENDOR' AUTUMN SPLENDOR BUCKEYE	2.5' CAL	B & B
	22	BETULA NIGRA 'CULLY' TM HERITAGE RIVER BIRCH	2.5' CAL	B & B
	11	CATALPA SPECIOSA NORTHERN CATALPA	2.5' CAL	B & B
	36	GINKGO BILOBA 'AUTUMN GOLD' TM AUTUMN GOLD MAIDENHAIR TREE	2.5' CAL	B & B
	28	GLEDITSIA TRIACANTHOS F. INERMIS THORNLESS HONEY LOCUST	2.5' CAL	B & B
	17	GYMNOCLADUS DIOICA 'ESPRESSO' KENTUCKY COFFEETREE	2.5' CAL	B & B
	15	MAACKIA AMURENSIS AMUR MAACKIA	2.5' CAL	B & B
	4	QUERCUS ALBA WHITE OAK	2.5' CAL	B & B
	12	QUERCUS BICOLOR SWAMP WHITE OAK	2.5' CAL	B & B
	8	QUERCUS ELLIPSOIDALIS NORTHERN PIN OAK	2.5' CAL	B & B
	16	QUERCUS ELLIPSOIDALIS 'BAILSKIES' TM MAJESTIC SKIES PIN OAK	2.5' CAL	B & B
	12	QUERCUS ROBUR X ALBA 'CRIMSCHMIDT' TM CRIMSON SPIRE OAK	2.5' CAL	B & B
	4	QUERCUS RUBRA RED OAK	2.5' CAL	B & B
	26	TILIA CORDATA 'GREENSPIRE' GREENSPIRE LITTLELEAF LINDEN	2.5' CAL	B & B



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JERREMY D. FOSS

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PROJECT

LENNAR

RESERVE AT

AUTUMN WOODS

CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	21-24984
FILE NAME	24984 LANDSCAPE
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

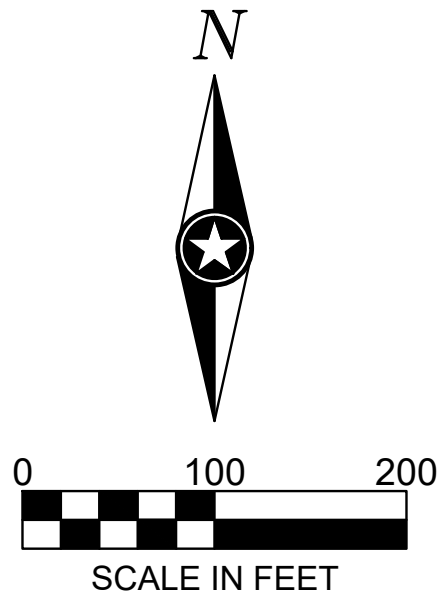
TITLE

**RESTORATION
AND PLANTING
PLAN**

SHEET

36

OF 47



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CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO. 21-24984
FILE NAME 24984 OVERALL
DRAWN BY JRS
DESIGNED BY JRS
REVIEWED BY JDF
ORIGINAL ISSUE DATE 07/06/21
CLIENT PROJECT NO. -

TITLE
PLANTING AND
UTILITY PLAN
(OVERALL)

SHEET

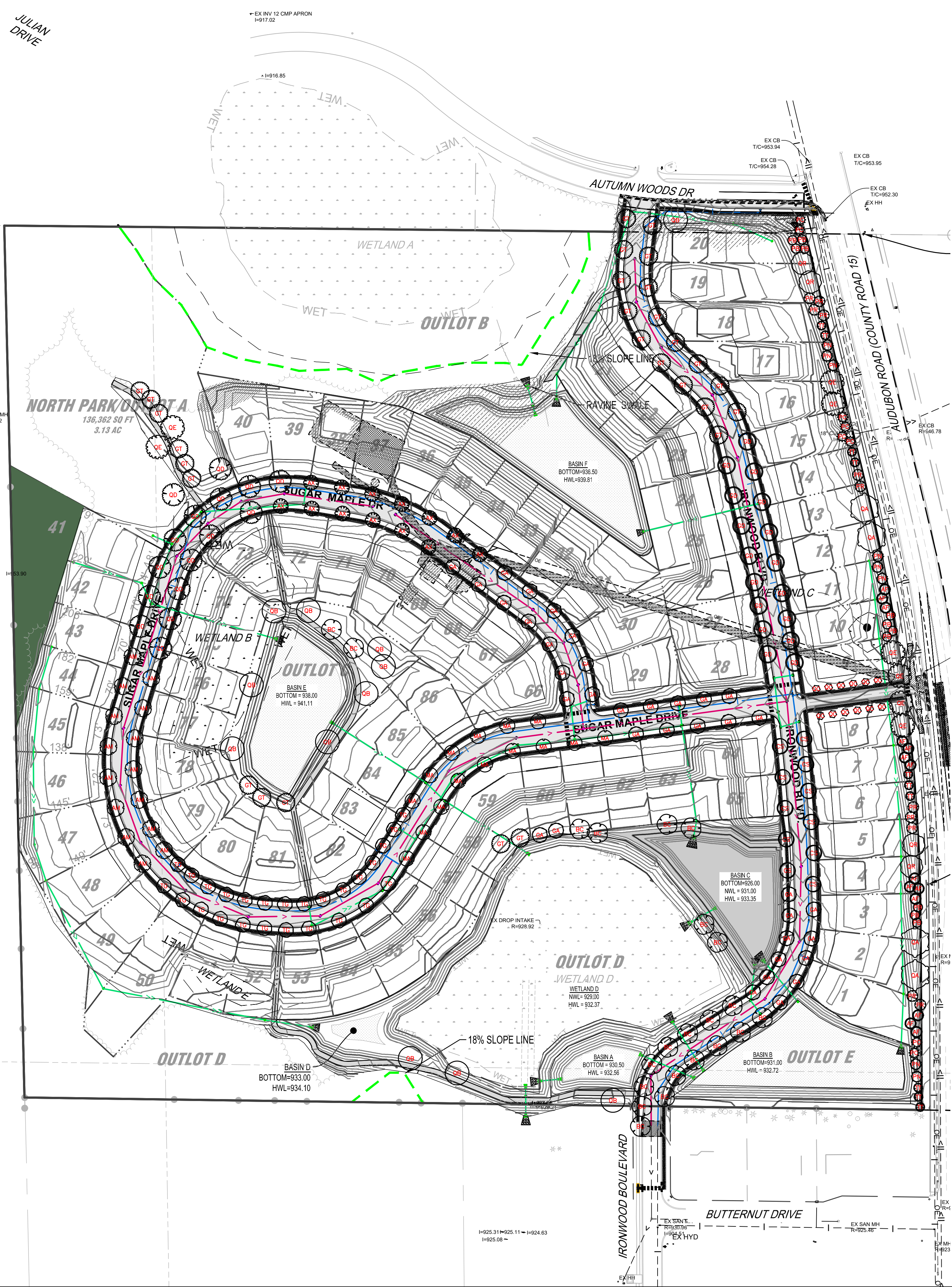
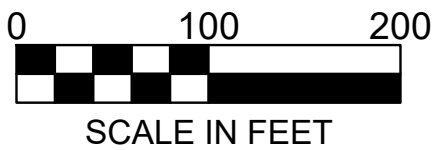
37

OF 47

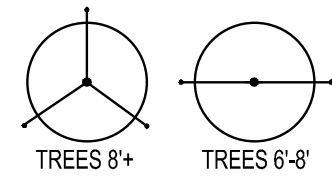
PLAN I SCHEDULE

EVERGREEN TREES	QTY	BOTANICAL / COMMON NAME	SIZE	ROOT
AF	14	ABIES FRASERI FRASER FIR	6' HT MIN	B & B
PB	11	PICEA GLAUCA DENSATA BLACK HILLS SPRUCE	6' HT MIN	B & B
PC	8	PICEA PUNGENS COLORADO SPRUCE	6' HT MIN	B & B
PN	8	PINUS NIGRA AUSTRIAN PINE	6' HT MIN	B & B
PR	11	PINUS RESINOSA RED PINE	6' HT MIN	B & B
TT	10	THUJA OCCIDENTALIS 'TECHNY' TECHNY ARBORVITAE	6' HT MIN	B & B
OVERSTORY TREES	QTY	BOTANICAL / COMMON NAME	SIZE	ROOT
AM	15	ACER X FREEMANII 'FIREFALL' FIREFALL MAPLE	2.5" CAL	B & B
AX	13	AESCULUS X 'AUTUMN SPLENDOR' AUTUMN SPLENDOR BUCKEYE	2.5" CAL	B & B
BC	22	BETULA NIGRA 'CULLY' TM HERITAGE RIVER BIRCH	2.5" CAL	B & B
CS	11	CATALPA SPECIOSA NORTHERN CATALPA	2.5" CAL	B & B
GA	36	GINKGO BILOBA 'AUTUMN GOLD' TM AUTUMN GOLD MAIDENHAIR TREE	2.5" CAL	B & B
GT	28	GLEDITSIA TRIACANTHOS F. INERMIS THORNLESS HONEY LOCUST	2.5" CAL	B & B
GD	17	GYMNOCLADUS DIOICA 'ESPRESSO' KENTUCKY COFFEETREE	2.5" CAL	B & B
MA	15	MAACKIA AMURENSIS AMUR MAACKIA	2.5" CAL	B & B
QA	4	QUERCUS ALBA WHITE OAK	2.5" CAL	B & B
QB	12	QUERCUS BICOLOR SWAMP WHITE OAK	2.5" CAL	B & B
QE	8	QUERCUS ELLIPSOIDALIS NORTHERN PIN OAK	2.5" CAL	B & B
QD	16	QUERCUS ELLIPSOIDALIS 'BAILSKIES' TM MAJESTIC SKIES PIN OAK	2.5" CAL	B & B

N



*NOTE: DO NOT
STAKE TREES
UNLESS INDICATED.



STAKING DIAGRAM,
NO STAKING TREES
UNDER 6'

HARDWOOD STAKES
2"X2"X8' LONG -
INSTALL OUTSIDE
OF ROOTBALL AT 5'
MAX HT

FINISH GRADE

DEPTH OF
ROOTBALL

ROOTBALL DIA

2X ROOTBALL DIA

NEVER CUT PRIMARY LEADER
PRUNE ALL BROKEN, DAMAGED, OR RUBBING LIMBS
AND BRANCHES IMMEDIATELY AFTER PLANTING -
ALL PRUNING CUTS CLEAN AT 90 DEGREES
TIE NYLON STRAP AROUND TRUNK AS SHOWN
1/2" WIDE NYLON STRAPPING - COLOR TO BE
APPROVED BY LANDSCAPE ARCHITECT
TOP OF ROOTBALL TO BE SET ABOVE GRADE 3"
3" LAYER OF DOUBLE SHREDDED HARDWOOD MULCH
(NATURAL COLOR) MOUNDED AT EDGE TO FORM A
SHALLOW SAUCER - DO NOT PLACE MULCH
DIRECTLY ON TREE TRUNK, LEAVE A MIN. 3" RING
AROUND CROWN. WHEN PLACED IN PLANTING BED
USE PLANTING BED MULCH SPECIFIED
CUT AND REMOVE AT MINIMUM THE TOP HALF OF
WIRE BASKETS, BURLAP AND/OR TWINE AND
REMOVE FROM THE PLANTING PIT. AVOID CUTTING
OR SCARRING ROOTS. ANY ROOTS THAT ARE
SCARRED OR BROKEN DURING PLANTING SHOULD
BE CUT CLEAN AT 90 DEGREES

BACKFILL PLANTING PIT PER TREE PLANTING
SPECIFICATIONS WHEN PROVIDED, OR WITH NATIVE
SOIL-EXCEPT WHEN IN HEAVY CLAY, MIX AMENDED
TOPSOIL FROM A LOCAL SOURCE WITH NATIVE SOIL
EXCAVATE PLANTING PIT TO A DEPTH EQUAL TO THE
DEPTH OF THE ROOTBALL MINUS 3" AND A MINIMUM
TWICE THE DIAMETER OF THE ROOTBALL
PLACE ROOTBALL ON UNDISTURBED SOIL AND
ENSURE TRUNK OF TREES IS PLUMB

DECIDUOUS TREE PLANTING DETAIL

SCALE: 1" = 1'-0

GENERAL PLANTING NOTES

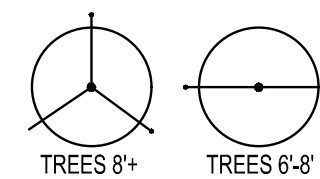
- COORDINATE LOCATION OF ALL UTILITIES (LINES, DUCTS, CONDUITS, SLEEVES, FOOTINGS, ETC.) WITH LOCATIONS OF PROPOSED LANDSCAPE ELEMENTS . CONTRACTOR SHALL REPORT ANY DISCREPANCIES TO OWNER'S REPRESENTATIVE PRIOR TO WORK.
- SAVE AND PROTECT ALL EXISTING TREES NOT NOTED TO BE REMOVED.
- REMOVE ALL CONSTRUCTION DEBRIS AND MATERIALS INJURIOUS TO PLANT GROWTH FROM PLANTING PITS AND BEDS PRIOR TO BACKFILLING WITH PLANTING MIX.
- ANY AREAS OUTSIDE THE LIMIT OF WORK THAT ARE DISTURBED SHALL BE RESTORED TO ITS ORIGINAL CONDITION AT NO ADDITIONAL COST TO OWNER.
- LAWN AREAS SHALL HAVE 6" MINIMUM DEPTH OF TOPSOIL OR ORGANIC MATTER SPREAD AND INCORPORATED INTO THE UNDERLYING SOIL DURING FINAL SITE TREATMENT WHEREVER TOPSOIL HAS BEEN REMOVED. TOPSOIL SHALL BE COMPACTED TO 85% MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT AND SHALL MEET WATERSHED DISTRICT'S (RPBCWD) TOPSOIL DEFINITION.
- REFER TO PLANTING DETAILS PLAN FOR AMENDED SOIL DEPTH IN PLANTING BEDS AND SURROUNDING TREES.
- FIELD STAKE PLANTINGS ACCORDING TO PLAN. OWNER'S REPRESENTATIVE SHALL APPROVE ALL PLANT LOCATIONS PRIOR TO INSTALLATION. OWNER RESERVES THE RIGHT TO REVISE PLANTING LAYOUT AT TIME OF INSTALLATION.
- ALL PLANT MATERIALS SHALL BE TRUE TO THEIR SCIENTIFIC NAME AND SIZE AS INDICATED IN THE PLANT SCHEDULE.
- IF DISCREPANCIES EXIST BETWEEN THE NUMBER OF PLANTS DRAWN ON THE PLANTING PLAN AND THE NUMBER OF PLANTS IN THE SCHEDULE, THE PLANTING PLAN SHALL GOVERN.
- OWNER RESERVES THE RIGHT TO REVISE QUANTITIES TO SUIT BUDGET LIMITATIONS. CONTRACTOR'S UNIT BID PRICES SHALL PREVAIL FOR ANY CHANGES IN QUANTITIES.
- ANY PROPOSED SUBSTITUTIONS OF PLANT SPECIES SHALL BE MADE WITH PLANTS OF EQUIVALENT OVERALL FORM, HEIGHT, BRANCHING HABIT, FLOWER, LEAF, COLOR, FRUIT AND CULTURE, AND ONLY AFTER WRITTEN APPROVAL OF THE OWNER'S REPRESENTATIVE AND OWNER.
- ALL PLANT MATERIALS MUST CONFORM TO AMERICAN STANDARDS FOR NURSERY STOCK (A.N.S.I.), LATEST EDITION PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, WASHINGTON D.C. LARGER SIZED PLANT MATERIALS OF THE SPECIES LISTED MAY BE USED IF THE STOCK CONFORMS TO A.N.S.I.
- ALL PLANT MATERIAL SHALL BE GUARANTEED TO BE IN A LIVE AND HEALTHY GROWING CONDITION FOR ONE FULL GROWING SEASON (ONE YEAR) AFTER FINAL PROJECT ACCEPTANCE OR SHALL BE REPLACED FREE OF CHARGE WITH THE SAME GRADE AND SPECIES. ALL TREES SHALL HAVE A STRONG CENTRAL LEADER.
- FOR TREES PROVIDE DOUBLE SHREDDED HARDWOOD MULCH RING (NATURAL COLOR) AT 3" DEPTH PER PLANTING DETAILS.
- ALL TURF AREAS DISTURBED BY CONSTRUCTION SHALL BE SODDED OR SEEDED PER PLANS.

ESTIMATED GROWTH (10 YEARS)

INSTALLED 12-16' HT. RANGE FOR 2-3' TALL TREE

NEW
BASSWOOD COURT

*NOTE: DO NOT
STAKE TREES
UNLESS INDICATED.



STAKING DIAGRAM,
NO STAKING TREES
UNDER 6'

HARDWOOD STAKES
2"X2"X8' LONG -
INSTALL OUTSIDE
OF ROOTBALL AT 5'
MAX HT

FINISH GRADE

DEPTH OF
ROOTBALL

ROOTBALL DIA

2X ROOTBALL DIA

NEVER CUT PRIMARY LEADER
PRUNE ALL BROKEN, DAMAGED, OR RUBBING LIMBS
AND BRANCHES IMMEDIATELY AFTER PLANTING - ALL
PRUNING CUTS CLEAN AT 90 DEGREES
TIE NYLON STRAP AROUND TRUNK AS SHOWN
1/2" WIDE NYLON STRAPPING - COLOR TO BE
APPROVED BY LANDSCAPE ARCHITECT
TOP OF ROOTBALL TO BE SET ABOVE GRADE 3"
3" LAYER OF DOUBLE SHREDDED HARDWOOD MULCH
MOUNDED AT EDGE TO FORM A SHALLOW SAUCER -
DO NOT PLACE MULCH DIRECTLY ON TREE TRUNK,
LEAVE A MIN. 3" RING AROUND CROWN. WHEN
PLACED IN PLANTING BED USE PLANTING BED MULCH
SPECIFIED
CUT AND REMOVE AT MINIMUM THE TOP HALF OF
WIRE BASKETS, BURLAP AND/OR TWINE AND REMOVE
FROM THE PLANTING PIT. AVOID CUTTING OR
SCARRING ROOTS. ANY ROOTS THAT ARE SCARRED
OR BROKEN DURING PLANTING SHOULD BE CUT
CLEAN AT 90 DEGREES

BACKFILL PLANTING PIT PER TREE PLANTING
SPECIFICATIONS WHEN PROVIDED, OR WITH NATIVE
SOIL-EXCEPT WHEN IN HEAVY CLAY, MIX AMENDED
TOPSOIL FROM A LOCAL SOURCE WITH NATIVE SOIL
EXCAVATE PLANTING PIT TO A DEPTH EQUAL TO THE
DEPTH OF THE ROOTBALL MINUS 3" AND A MINIMUM
TWICE THE DIAMETER OF THE ROOTBALL
PLACE ROOTBALL ON UNDISTURBED SOIL AND
ENSURE TRUNK OF TREES IS PLUMB

CONIFER / EVERGREEN TREE PLANTING DETAIL

SCALE: 1" = 1'-0



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JERREMY D. FOSS

DATE: _____ LIC. NO. 55871

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PROJECT

LENNAR

RESERVE AT
AUTUMN WOODS

CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	21-24984
FILE NAME	24984 LANDSCAPE
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

TITLE
**PLANTING NOTES
AND DETAILS**

SHEET

38

OF 47

PRELIMINARY NOT FOR CONSTRUCTION

PLT DATE: 10/12/2021 10:05 AM



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JERREMY D. FOSS

DATE: LIC. NO. 55871

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PROJECT

LENNAR
RESERVE AT
AUTUMN WOODS

CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

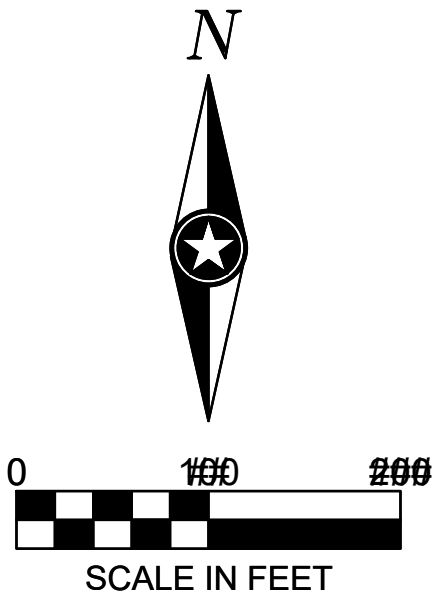
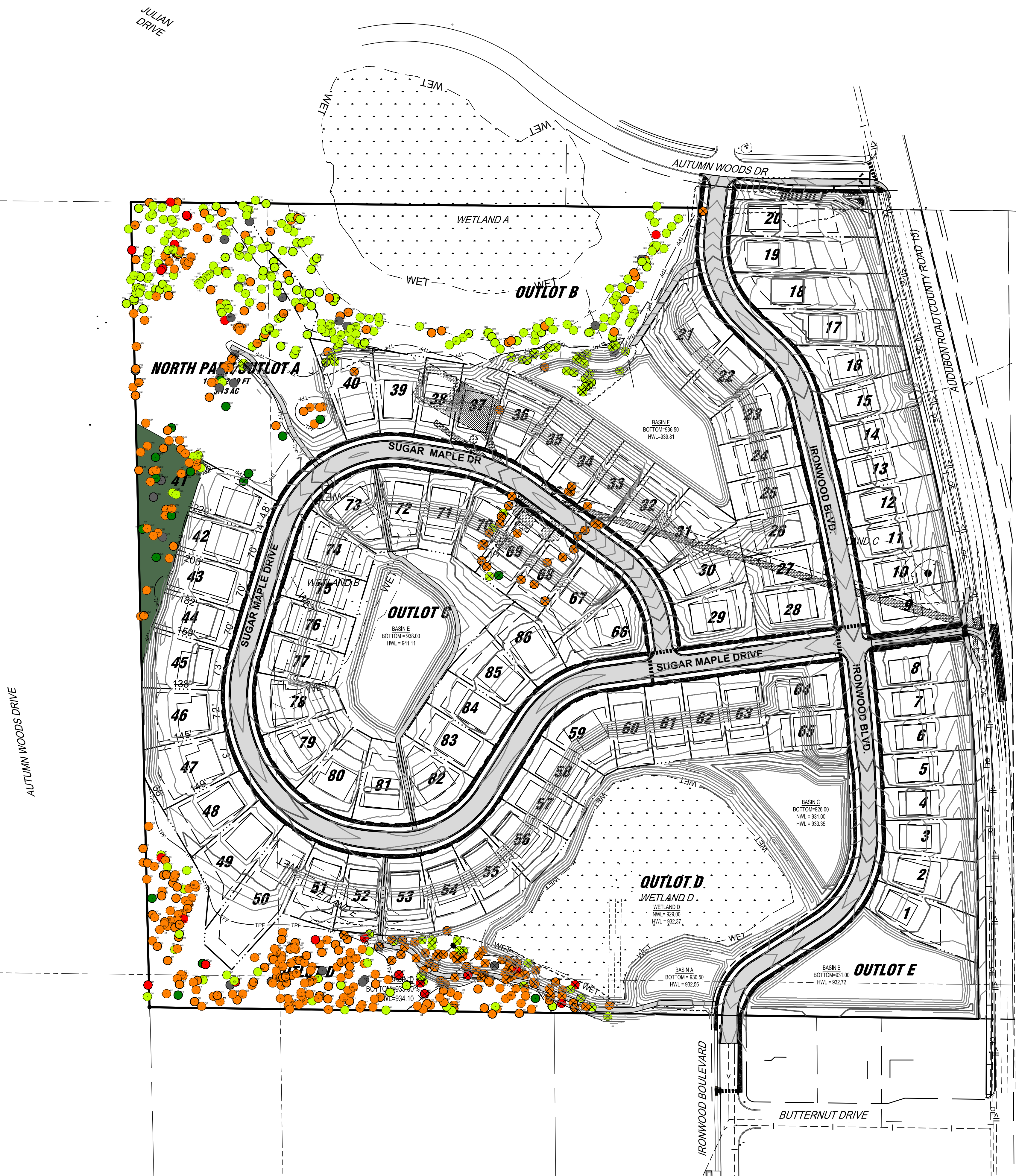
PROJECT NO.	21-24984
FILE NAME	24984 TREE PRES
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

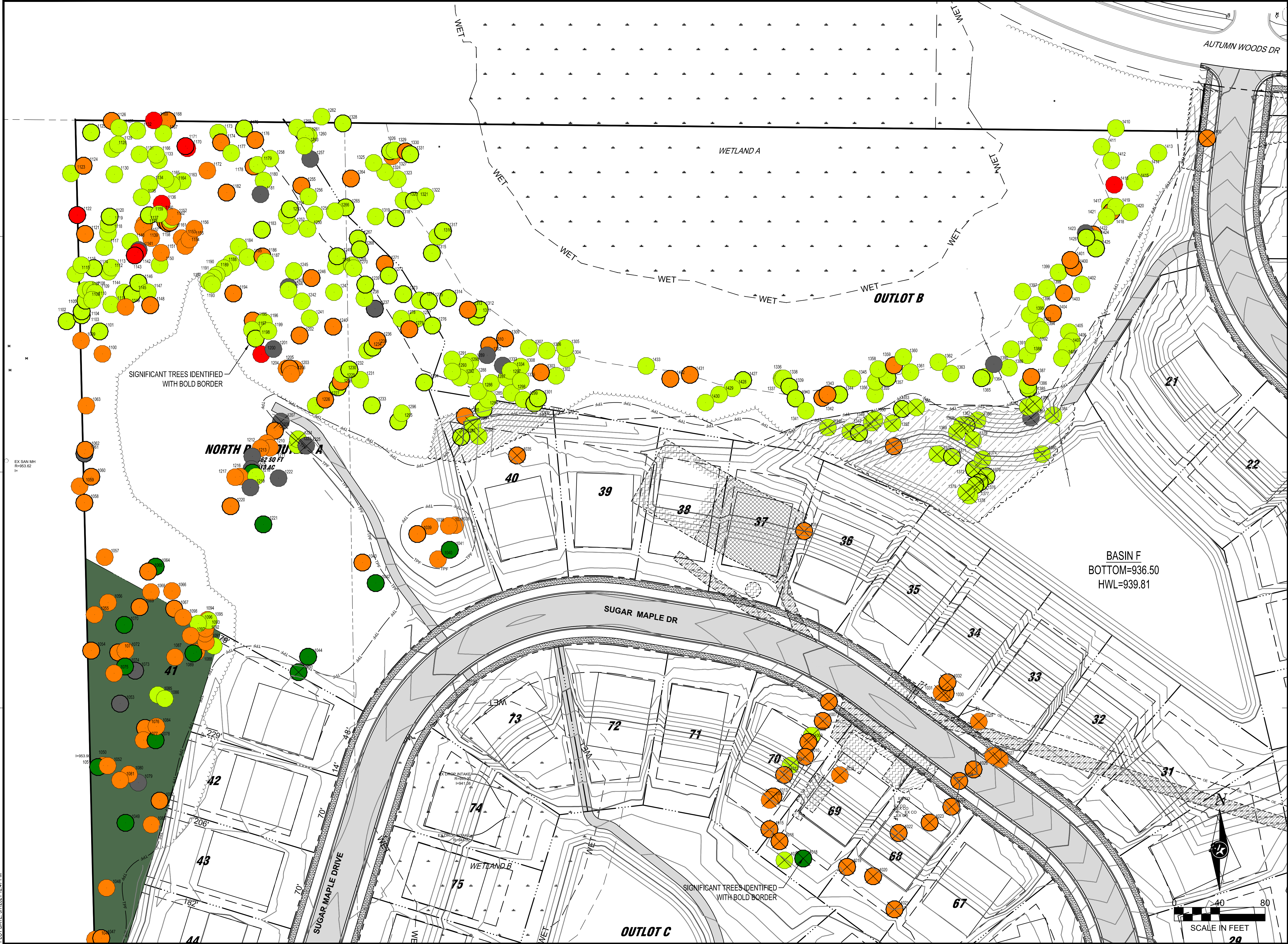
TITLE
**OVERALL TREE
PRESERVATION**

SHEET
39

OF 47

PRELIMINARY NOT FOR CONSTRUCTION PRELIMINARY NOT FOR CONSTRUCTION PRELIMINARY NOT FOR CONSTRUCTION





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PROJECT

LENNAR
RESERVE AT
AUTUMN WOODS

CHASKA MINNESOTA

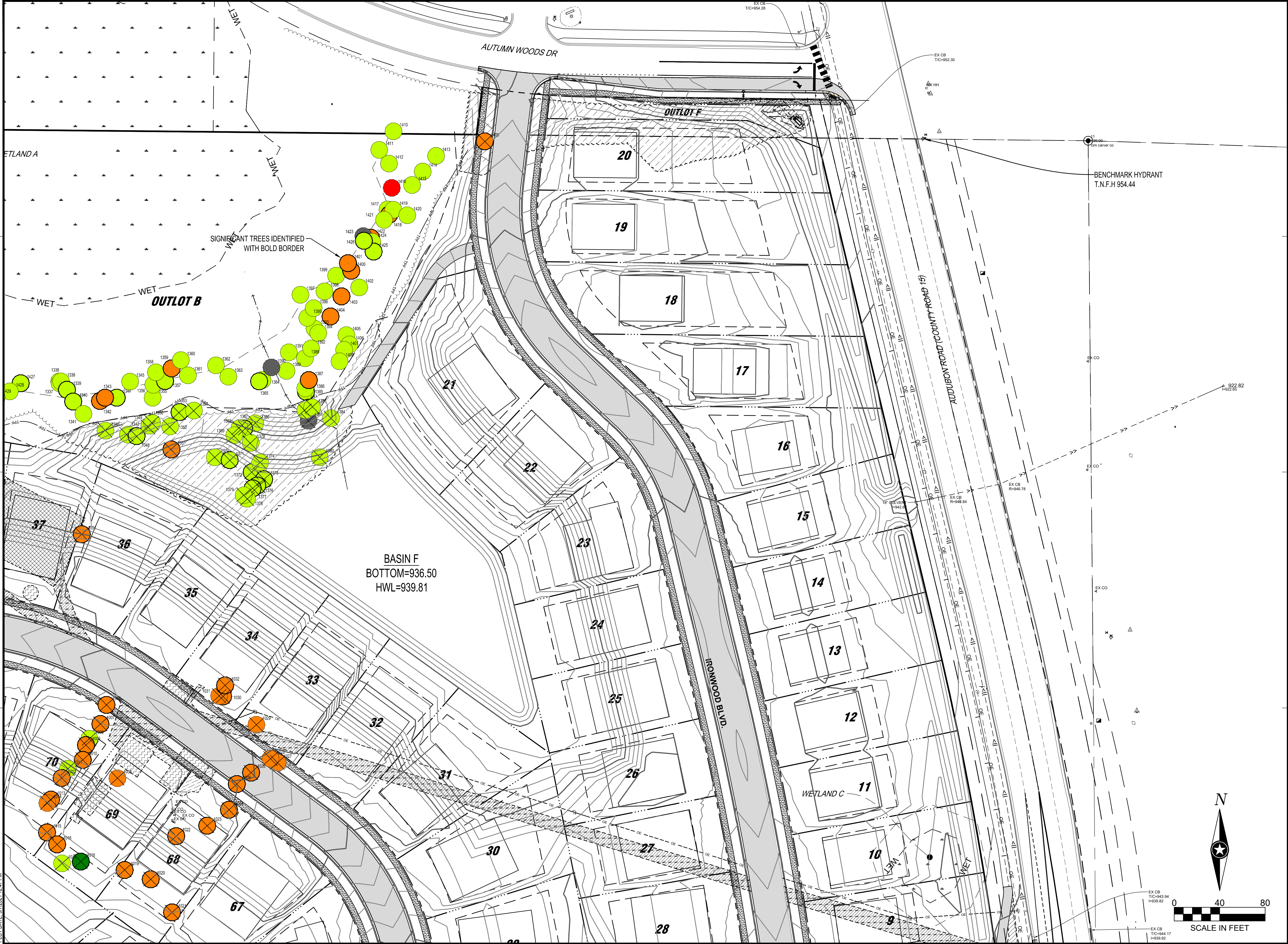
REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	21-24984
FILE NAME	24984 TREE PRES
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

TREE
PRESERVATION A

SHEET
40
OF 47

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**LENNAR
RESERVE AT
AUTUMN WOODS**

CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	21-24984
FILE NAME	24984 TREE PRES
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

TITLE

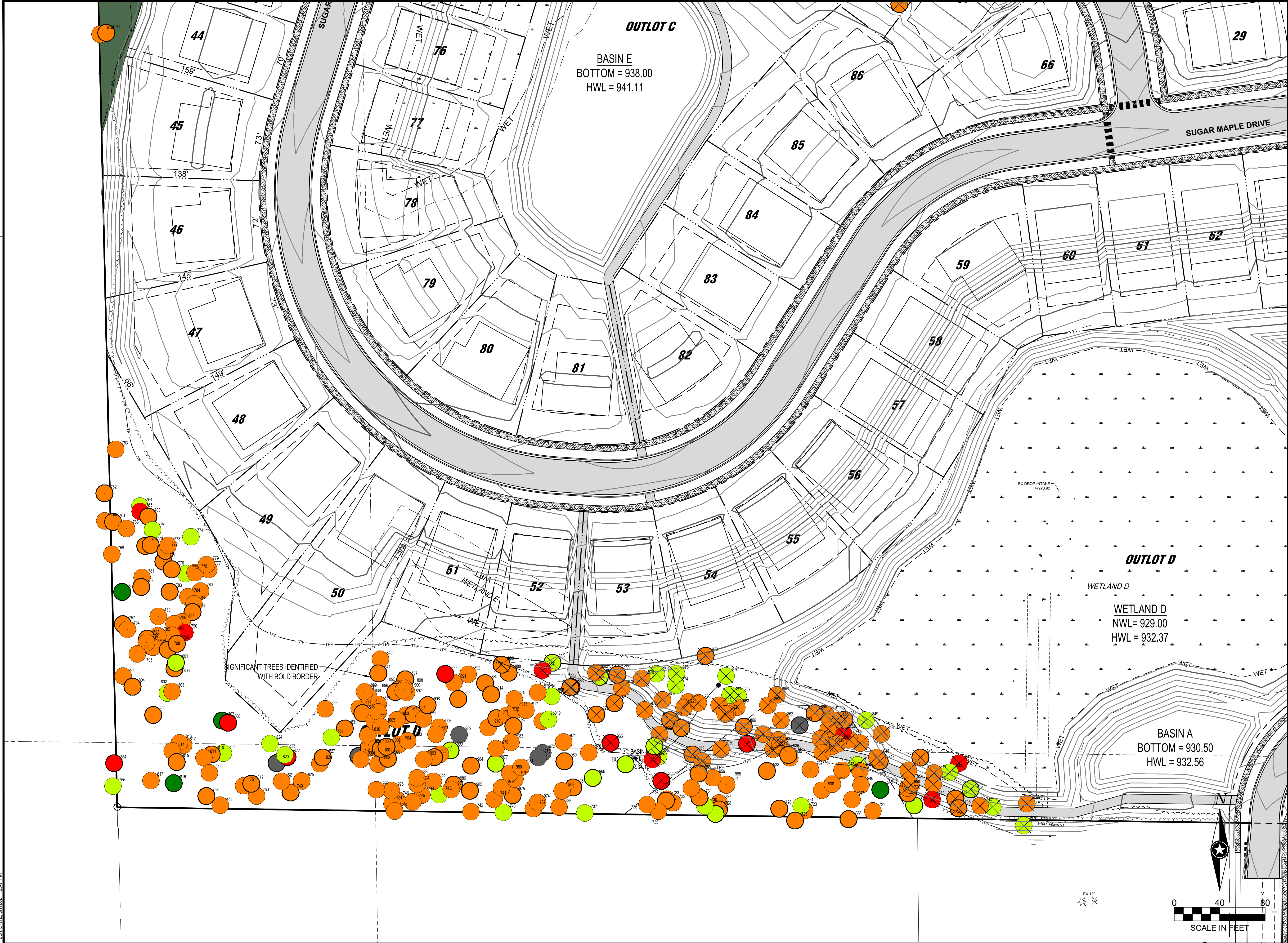
**TREE
PRESERVATION B**

SHEET

41

OF 47

PRELIMINARY NOT FOR CONSTRUCTION PRELIMINARY NOT FOR CONSTRUCTION PRELIMINARY NOT FOR CONSTRUCTION



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PROJECT

**LENNAR
RESERVE AT
AUTUMN WOODS**

CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	21-24984
FILE NAME	24984 TREE PRES
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

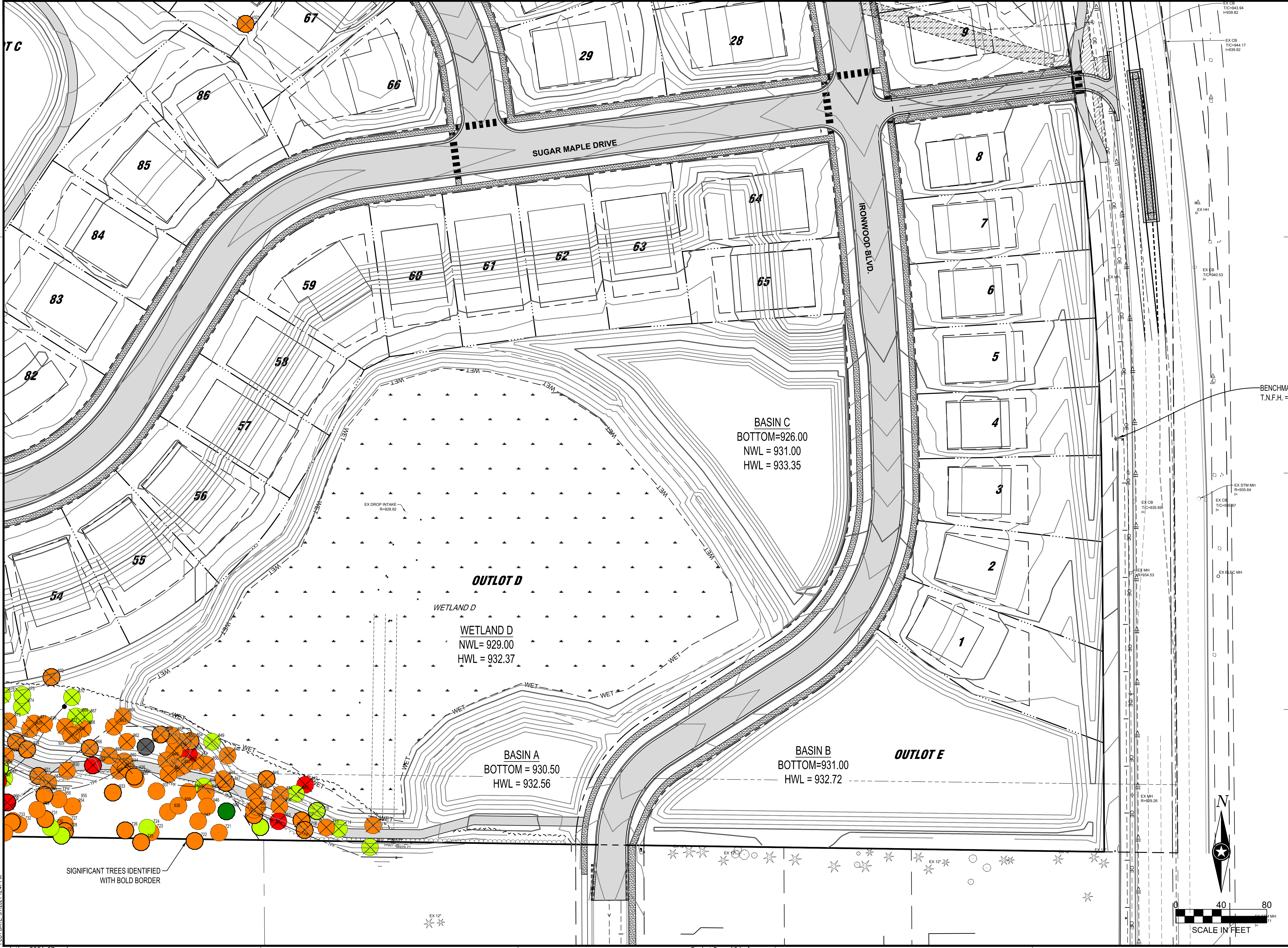
**TREE
PRESERVATION C**

SHEET

42

OF 47

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PROJECT

LENNAR RESERVE AT AUTUMN WOODS

CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	21-24984
FILE NAME	24984 TREE PRES
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

TITLE

TREE PRESERVATION D

SHEET

43

OF 47

PRELIMINARY NOT FOR CONSTRUCTION PRELIMINARY NOT FOR CONSTRUCTION

LOT DATE: 9/7/2021 12:47 PM

Tree Tag Number	Tree Species	DBH (Inches)	Structural Condition	Health Condition	Removals
712	Elm, American	8	3-Fair	2-Good	X
713	Oak, Northern Red	6	2-Good	2-Good	X
714	Maple, Sugar	7	3-Fair	2-Good	X
715	Maple, Sugar	6	2-Good	2-Good	X
716	Maple, Sugar	14	3-Fair	3-Fair	X
717	Basswood, American	26	2-Good	2-Good	X
718	Oak, Northern Red	29	2-Good	2-Good	X
719	Oak, White	16	3-Fair	2-Good	
720	Oak, White	19	2-Good	2-Good	X
721	Basswood, American	10	2-Good	2-Good	
722	Elm, American	12	2-Good	3-Fair	
723	Elm, American	9	2-Good	2-Good	
724	Basswood, American	9	3-Fair	2-Good	
725	Basswood, American	14	2-Good	2-Good	
726	Hackberry	12	2-Good	2-Good	
727	Elm, American	6	2-Good	2-Good	
728	Basswood, American	16	2-Good	2-Good	
729	Basswood, American	16	3-Fair	2-Good	
730	Elm, American	11	3-Fair	2-Good	
731	Basswood, American	15	2-Good	2-Good	
732	Elm, American	9	2-Good	2-Good	
733	Ash, Black	7	2-Good	2-Good	
734	Hickory, Bitternut	12	2-Good	2-Good	
735	Basswood, American	11	2-Good	2-Good	
736	Oak, Northern Pin	10	2-Good	2-Good	
737	Elm, American	8	3-Fair	2-Good	
738	Maple, Sugar	9	2-Good	2-Good	
739	Maple, Sugar	6	2-Good	2-Good	
740	Basswood, American	11	3-Fair	3-Fair	
741	Maple, Sugar	6	2-Good	2-Good	
742	Hickory, Bitternut	7	2-Good	3-Fair	
743	Maple, Sugar	7	3-Fair	2-Good	
744	Elm, American	6	2-Good	2-Good	
745	Basswood, American	11	2-Good	2-Good	
746	Basswood, American	8	2-Good	2-Good	
747	Maple, Sugar	9	2-Good	2-Good	
748	Maple, Sugar	10	2-Good	2-Good	
749	Cottonwood, Eastern	30	2-Good	2-Good	
750	Maple, Sugar	8	2-Good	2-Good	
751	Hickory, Bitternut	12	2-Good	2-Good	
752	Hickory, Bitternut	6	2-Good	2-Good	
753	Elm, American	13	2-Good	2-Good	
754	Maple, Sugar	29	4-Poor	4-Poor	
755	Elm, American	7	3-Fair	2-Good	
756	Oak, White	7	2-Good	2-Good	
757	Basswood, American	14	2-Good	2-Good	
758	Cottonwood, Eastern	35	1-Excellent	2-Good	
759	Maple, Sugar	8	2-Good	2-Good	
760	Basswood, American	11	2-Good	2-Good	
761	Basswood, American	14	2-Good	2-Good	
762	Cottonwood, Eastern	29	2-Good	2-Good	
763	Oak, Northern Red	6	2-Good	2-Good	
764	Elm, American	7	3-Fair	2-Good	
765	Elm, American	6	4-Poor	2-Good	
766	Cottonwood, Eastern	41	2-Good	2-Good	
767	Ash, Black	7	3-Fair	2-Good	
768	Oak, Black	8	2-Good	2-Good	
769	Cottonwood, Eastern	23	2-Good	3-Fair	
770	Basswood, American	12	2-Good	2-Good	
771	Elm, American	14	2-Good	2-Good	
772	Oak, White	13	2-Good	2-Good	
773	Maple, Norway	7	2-Good	2-Good	
774	Hickory, Bitternut	7	3-Fair	2-Good	
775	Oak, White	7	3-Fair	2-Good	
776	Oak, White	12	2-Good	2-Good	
777	Oak, Northern Red	10	2-Good	3-Fair	
778	Elm, American	10	2-Good	2-Good	
779	Oak, Northern Red	11	2-Good	2-Good	
780	Oak, White	8	2-Good	2-Good	
781	Oak, Northern Pin	7	2-Good	2-Good	
782	Hackberry	12	2-Good	2-Good	
783	Cottonwood, Eastern	31	2-Good	2-Good	
784	Maple, Sugar	10	2-Good	2-Good	
785	Basswood, American	8	2-Good	2-Good	
786	Basswood, American	12	2-Good	2-Good	
787	Oak, Black	11	2-Good	2-Good	
788	Oak, White	9	2-Good	2-Good	
789	Oak, White	6	2-Good	2-Good	
790	Basswood, American	11	4-Poor	2-Good	
791	Oak, Northern Pin	7	2-Good	2-Good	
792	Hickory, Bitternut	11	2-Good	2-Good	
793	Hickory, Bitternut	13	2-Good	2-Good	

794	Oak, Northern Red	10	2-Good	2-Good	
795	Hickory, Bitternut	12	2-Good	2-Good	
796	Hickory, Bitternut	6	2-Good	2-Good	
797	Oak, Northern Red	7	2-Good	2-Good	
798	Basswood, American	14	2-Good	2-Good	
799	Basswood, American	13	2-Good	2-Good	
800	Basswood, American	18	2-Good	2-Good	
801	Locust, Black	14	3-Fair	2-Good	
802	Oak, Northern Pin	8	3-Fair	3-Fair	
803	Oak, Northern Pin	9	2-Good	2-Good	
804	Hickory, Bitternut	13	2-Good	2-Good	
805	Hickory, Bitternut	7	2-Good	3-Fair	
806	Locust, Black	32	2-Good	3-Fair	
807	Oak, Black	45	1-Excellent	2-Good	
808	Elm, American	12	4-Poor	4-Poor	
809	Oak, Northern Red	9	3-Fair	4-Poor	
810	Oak, Northern Red	12	2-Good	2-Good	
811	Oak, Northern Pin	6	2-Good	2-Good	
812	Oak, Northern Pin	8	2-Good	2-Good	
813	Oak, Northern Pin	10	2-Good	2-Good	
814	Oak, Northern Red	10	2-Good	2-Good	
815	Cottonwood, Eastern	30	2-Good	2-Good	
816	Locust, Black	34	1-Excellent	2-Good	
817	Basswood, American	16	2-Good	2-Good	
818	Hackberry	9	2-Good	2-Good	
819	Oak, Northern Red	18	2-Good	2-Good	
820	Cottonwood, Eastern	26	5-Dead	5-Dead	
821	Elm, American	7	2-Good	2-Good	
822	Basswood, American	12	4-Poor	3-Fair	
823	Oak, Northern Pin	10	3-Fair	3-Fair	
824	Oak, Northern Pin	8	3-Fair	2-Good	
825	Oak, Northern Red	9	2-Good	2-Good	
826	Oak, Northern Pin	11	2-Good	2-Good	
827	Oak, Northern Red	15	2-Good	2-Good	
828	Chestnut, American	13	5-Dead	5-Dead	
829	Oak, Northern Red	15	2-Good	2-Good	
830	Hickory, Bitternut	6	2-Good	2-Good	
831	Cottonwood, Eastern	30	2-Good	2-Good	
832	Maple, Sugar	11	3-Fair	2-Good	
833	Elm, American	8	2-Good	2-Good	
834	Hickory, Bitternut	8	2-Good	2-Good	
835	Hickory, Bitternut	12	2-Good	2-Good	
836	Oak, Northern Pin	10	2-Good	2-Good	
837	Locust, Black	9	2-Good	2-Good	
838	Maple, Sugar	11	2-Good	2-Good	
839	Maple, Sugar	9	2-Good	2-Good	
840	Maple, Black	10	2-Good	2-Good	
841	Maple, Black	17	2-Good	2-Good	
842	Elm, American	9	4-Poor	3-Fair	X
843	Maple, Sugar	7	3-Fair	2-Good	X
844	Maple, Sugar	14	2-Good	3-Fair	X
845	Oak, Northern Red	6	2-Good	2-Good	X
846	Maple, Sugar	17	2-Good	2-Good	X
847	Oak, White	22	2-Good	2-Good	X
848	Basswood, American	7	2-Good	2-Good	X
849	Oak, Northern Pin	6	3-Fair	3-Fair	X
850	Oak, Northern Pin	9	2-Good	2-Good	X
851	Maple, Sugar	6	2-Good	2-Good	X
852	Locust, Black	10	2-Good	3-Fair	X
853	Basswood, American	10	4-Poor	2-Good	X
854	Elm, American	19	2-Good	2-Good	X
855	Oak, Northern Red	12	2-Good	2-Good	X
856	Oak, Northern Red	8	2-Good	2-Good	X
857	Maple, Sugar	8	2-Good	2-Good	X
858	Maple, Sugar	12	2-Good	2-Good	X
859	Ash, White	27	5-Dead	5-Dead	X
860	Maple, Sugar	7	2-Good	2-Good	X
861	Basswood, American	6	2-Good	2-Good	X
862	Elm, American	11	2-Good	2-Good	X
863	Maple, Sugar	11	2-Good	2-Good	X
864	Locust, Black	11	2-Good	2-Good	X
865	Maple, Sugar	8	2-Good	2-Good	X
866	Basswood, American	21	2-Good	2-Good	X
867	Maple, Sugar	9	3-Fair	2-Good	X
868	Maple, Sugar	6	2-Good	2-Good	X
869	Locust, Black	10	3-Fair	2-Good	X
870	Elm, American	11	3-Fair	2-Good	X
871	Oak, Northern Pin	11	2-Good	2-Good	X
872	Maple, Sugar	16	2-Good	2-Good	X
873	Hickory, Bitternut	11	2-Good	2-Good	X
874	Basswood, American	10	3-Fair	2-Good	X
875	Maple, Sugar	6	3-Fair	3-Fair	X
876	Ash, White	8	3-Fair	2-Good	X
877	Maple, Sugar	9	2-Good	2-Good	X

878	Maple, Sugar	10	2-Good	2-Good	X
879	Elm, American	8	2-Good	2-Good	X
880	Basswood, American	19	2-Good	2-Good	X
881	Basswood, American	12	3-Fair	2-Good	X
882	Hickory, Bitternut	7	2-Good	2-Good	X
883	Maple, Sugar	14	4-Poor	3-Fair	X
884	Maple, Sugar	12	2-Good	2-Good	X
885	Maple, Sugar	14	3-Fair	2-Good	X
886	Locust, Black	11	3-Fair	3-Fair	
887	Maple, Sugar	8	4-Poor	4-Poor	X
888	Maple, Sugar	15	2-Good	2-Good	X
889	Maple, Sugar	12	2-Good	2-Good	
890	Maple, Sugar	20	2-Good	2-Good	X
891	Basswood, American	6	2-Good	3-Fair	
892	Basswood, American	6	2-Good	2-Good	
893	Maple, Sugar	17	4-Poor	4-Poor	
894	Maple, Sugar	12	2-Good	3-Fair	
895	Maple, Sugar	16	2-Good	2-Good	
896	Oak, Northern Red	14	2-Good	2-Good	
897	Maple, Sugar	10	2-Good	2-Good	
898	Oak, Northern Red	10	2-Good	3-Fair	
899	Maple, Sugar	10	2-Good	2-Good	
900	Maple, Sugar	7	2-Good	2-Good	
901	Oak, Northern Pin	13	2-Good	2-Good	
902	Maple, Sugar	11	2-Good	2-Good	
903	Maple, Sugar	7	2-Good	2-Good	
904	Maple, Sugar	7	2-Good	2-Good	
905	Maple, Sugar	7	2-Good	2-Good	
906	Oak, Northern Red	11	2-Good	2-Good	
907	Maple, Sugar	10	2-Good	2-Good	
908	Locust, Honey	13	2-Good	2-Good	
909	Hickory, Shagbark	27	2-Good	3-Fair	
910	Maple, Sugar	9	2-Good	2-Good	
911	Oak, Northern Pin	13	2-Good	2-Good	
912	Maple, Sugar	11	2-Good	2-Good	
913	Maple, Sugar	8	2-Good	2-Good	
914	Oak, Northern Pin	12	2-Good	2-Good	
915	Maple, Sugar	9	2-Good	2-Good	
916	Maple, Sugar	8	2-Good	2-Good	
917	Maple, Sugar	7	2-Good	2-Good	
918	Maple, Sugar	8	2-Good	2-Good	
919	Oak, Northern Red	8	3-Fair	2-Good	
920	Maple, Sugar	21	2-Good	2-Good	X
921	Oak, White	24	2-Good	2-Good	X
922	Elm, American	9	2-Good	2-Good	X
923	Basswood, American	16	2-Good	2-Good	X
924	Cottonwood, Eastern	25	2-Good	2-Good	X
925	Elm, American	7	2-Good	2-Good	X
926	Maple, Sugar	7	2-Good	2-Good	X
927	Oak, Northern Red	10	2-Good	2-Good	X
928	Maple, Sugar	7	2-Good	2-Good	X
929	Maple, Sugar	9	2-Good	2-Good	X
930	Maple, Sugar	6	2-Good	2-Good	X
931	Oak, Northern Red	21	2-Good	2-Good	X
932	Locust, Black	26	4-Poor	3-Fair	X
933	Oak, Northern Red	22	2-Good	2-Good	
934	Maple, Sugar	8	2-Good	2-Good	X
935	Maple, Sugar	6	2-Good	2-Good	
936	Oak, Northern Red	16	2-Good	2-Good	
937	Oak, Northern Pin	8	2-Good	2-Good	
938	Oak, White	11	2-Good	2-Good	
939	Maple, Sugar	7	2-Good	2-Good	
940	Maple, Sugar	9	2-Good	2-Good	X
941	Maple, Sugar	8	2-Good	2-Good	X
942	Maple, Sugar	7	2-Good	2-Good	X
943	Maple, Sugar	6	2-Good	2-Good	
944	Elm, American	6	3-Fair	2-Good	X
945	Maple, Sugar	8	2-Good	2-Good	
946	Maple, Sugar	7	2-Good	2-Good	
947	Oak, Northern Red	10	2-Good	2-Good	
948	Maple, Sugar	7	2-Good	3-Fair	X
949	Oak, Northern Red	34	1-Excellent	1-Excellent	
950	Maple, Sugar	6	2-Good	3-Fair	X
951	Maple, Sugar	8	2-Good	2-Good	X
952	Maple, Sugar	7	2-Good	2-Good	X
953	Oak, Northern Red	10	4-Poor	3-Fair	X
954	Basswood, American	6	2-Good	2-Good	
955	Basswood, American	10	2-Good	2-Good	
956	Basswood, American	11	2-Good	2-Good	
957	Basswood, American	11	2-Good	2-Good	X
958	Basswood, American	12	2-Good	2-Good	
959	Basswood, American	7	2-Good	2-Good	
960	Basswood, American	13	4-Poor	3-Fair	X
961	Basswood, American	11	3-Fair	3-Fair	X



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LOT DATE: 9/7/2021 12:47 PM

Tree Tag Number	Tree Species	DBH (Inches)	Structural Condition	Health Condition	Removals
962	Basswood, American	6	4-Poor	2-Good	X
963	Basswood, American	14	3-Fair	2-Good	X
964	Oak, White	14	3-Fair	3-Fair	
965	Oak, Northern Red	27	4-Poor	4-Poor	X
966	Oak, Northern Pin	16	3-Fair	2-Good	
967	Oak, Northern Red	26	2-Good	2-Good	
968	Maple, Sugar	7	2-Good	2-Good	
969	Oak, Northern Red	21	2-Good	2-Good	
970	Maple, Sugar	6	2-Good	2-Good	
971	Maple, Sugar	9	2-Good	2-Good	
972	Elm, American	10	5-Dead	5-Dead	
973	Elm, American	6	5-Dead	5-Dead	
974	Maple, Sugar	6	2-Good	2-Good	
975	Basswood, American	17	2-Good	2-Good	
976	Basswood, American	11	2-Good	2-Good	
977	Oak, Northern Pin	12	3-Fair	2-Good	
978	Maple, Sugar	9	2-Good	2-Good	
979	Maple, Sugar	6	2-Good	2-Good	
980	Maple, Sugar	8	2-Good	2-Good	
981	Maple, Sugar	9	2-Good	2-Good	
982	Ash, White	27	2-Good	2-Good	
983	Hickory, Bitternut	10	2-Good	2-Good	
984	Hickory, Bitternut	12	2-Good	2-Good	
985	Locust, Black	13	2-Good	3-Fair	
986	Basswood, American	16	2-Good	2-Good	
987	Elm, American	6	2-Good	2-Good	
988	Elm, American	6	2-Good	2-Good	
989	Elm, American	6	5-Dead	5-Dead	
990	Locust, Black	15	3-Fair	3-Fair	
991	Maple, Sugar	9	2-Good	2-Good	
992	Locust, Black	14	2-Good	2-Good	
993	Maple, Sugar	8	2-Good	2-Good	
994	Elm, American	11	2-Good	2-Good	
995	Ash, White	11	2-Good	2-Good	
996	Maple, Sugar	10	2-Good	2-Good	
997	Maple, Sugar	7	2-Good	2-Good	
998	Maple, Sugar	10	2-Good	2-Good	
999	Oak, Northern Red	13	2-Good	2-Good	
1000	Maple, Sugar	8	2-Good	2-Good	
1001	Maple, Sugar	10	2-Good	2-Good	
1002	Maple, Sugar	12	2-Good	2-Good	
1003	Maple, Sugar	7	2-Good	2-Good	
1004	Maple, Sugar	11	2-Good	2-Good	
1005	Maple, Sugar	11	2-Good	2-Good	
1006	Spruce, White	20	2-Good	2-Good	X
1007	Spruce, White	24	2-Good	2-Good	X
1008	Spruce, White	6	3-Fair	3-Fair	X
1009	Spruce, White	15	2-Good	2-Good	X
1010	Spruce, White	13	2-Good	3-Fair	X
1011	Spruce, White	9	3-Fair	3-Fair	X
1012	Spruce, White	12	2-Good	2-Good	X
1013	Spruce, White	13	2-Good	2-Good	X
1014	Spruce, White	9	2-Good	3-Fair	X
1015	Spruce, White	15	2-Good	2-Good	X
1016	Spruce, White	15	2-Good	2-Good	X
1017	Spruce, White	7	3-Fair	2-Good	X
1018	Oak, White	35	1-Excellent	2-Good	X
1019	Walnut, Black	19	2-Good	2-Good	X
1020	Spruce, White	20	2-Good	2-Good	X
1021	Walnut, Black	25	2-Good	2-Good	X
1022	Spruce, White	25	2-Good	2-Good	X
1023	Spruce, White	14	2-Good	2-Good	X
1024	Spruce, White	12	2-Good	3-Fair	X
1025	Spruce, White	21	2-Good	2-Good	X
1026	Spruce, White	21	2-Good	2-Good	X
1027	Spruce, White	4	2-Good	2-Good	X
1028	Spruce, White	6	2-Good	2-Good	X
1029	Pine, Red	3	2-Good	2-Good	X
1030	Spruce, White	12	2-Good	3-Fair	X
1031	Spruce, White	8	2-Good	2-Good	X
1032	Spruce, White	12	2-Good	2-Good	X
1033	Oak, White	12	2-Good	2-Good	X
1034	Basswood, American	21	2-Good	3-Fair	X
1035	Elm, American	13	2-Good	3-Fair	X
1036	Elm, American	7	2-Good	3-Fair	
1037	Elm, American	9	2-Good	3-Fair	
1038	Elm, American	6	2-Good	3-Fair	
1039	Elm, American	13	2-Good	3-Fair	
1040	Elm, American	6	2-Good	3-Fair	
1041	Oak, White	37	1-Excellent	3-Fair	
1042	Oak, White	35	1-Excellent	3-Fair	
1043	Oak, White	27	2-Good	3-Fair	
1044	Oak, White	34	1-Excellent	3-Fair	

1045	Oak, White	49	1-Excellent	3-Fair	X
1046	Maple, Sugar	8	2-Good	3-Fair	
1047	Maple, Sugar	13	2-Good	3-Fair	
1048	Elm, American	6	2-Good	3-Fair	
1049	Ash, White	41	1-Excellent	3-Fair	
1050	Elm, American	6	2-Good	3-Fair	
1051	Oak, White	33	1-Excellent	3-Fair	
1052	Elm, American	10	2-Good	3-Fair	
1053	Elm, American	14	5-Dead	5-Dead	
1054	Oak, White	23	2-Good	3-Fair	
1055	Oak, Northern Red	8	2-Good	3-Fair	
1056	Oak, Northern Red	9	2-Good	3-Fair	
1057	Elm, American	8	2-Good	3-Fair	
1058	Basswood, American	12	2-Good	3-Fair	
1059	Hickory, Bitternut	8	2-Good	3-Fair	
1060	Oak, White	27	2-Good	3-Fair	
1061	Elm, American	12	5-Dead	5-Dead	
1062	Ash, White	15	2-Good	3-Fair	
1063	Oak, White	10	2-Good	3-Fair	
1064	Oak, White	38	1-Excellent	3-Fair	
1065	Elm, American	15	2-Good	3-Fair	
1066	Elm, American	10	2-Good	3-Fair	
1067	Oak, White	28	2-Good	3-Fair	
1068	Elm, American	8	2-Good	3-Fair	
1069	Oak, Bur	22	2-Good	3-Fair	
1070	Oak, Northern Red	32	1-Excellent	3-Fair	
1071	Elm, American	14	2-Good	3-Fair	
1072	Elm, American	8	2-Good	3-Fair	
1073	Elm, American	15	5-Dead	5-Dead	
1074	Oak, White	36	1-Excellent	3-Fair	
1075	Elm, American	6	2-Good	3-Fair	
1076	Oak, White	29	2-Good	3-Fair	
1077	Elm, American	6	2-Good	3-Fair	
1078	Oak, White	50	1-Excellent	3-Fair	
1079	Elm, American	8	5-Dead	5-Dead	
1080	Elm, American	10	2-Good	3-Fair	
1081	Elm, American	10	2-Good	3-Fair	
1082	Hackberry	15	2-Good	3-Fair	
1083	Ash, White	10	2-Good	3-Fair	
1084	Elm, American	7	2-Good	3-Fair	
1085	Elm, American	8	3-Fair	3-Fair	
1086	Elm, American	10	3-Fair	3-Fair	
1087	Oak, White	8	2-Good	3-Fair	
1088	Elm, American	7	2-Good	3-Fair	
1089	Oak, Northern Red	32	1-Excellent	3-Fair	
1090	Elm, American	6	3-Fair	3-Fair	
1091	Ash, White	10	2-Good	3-Fair	
1092	Ash, White	11	2-Good	3-Fair	
1093	Ash, White	9	2-Good	3-Fair	
1094	Ash, White	9	2-Good	3-Fair	
1095	Ash, White	11	3-Fair	3-Fair	
1096	Ash, White	9	3-Fair	3-Fair	
1097	Elm, American	7	2-Good	3-Fair	
1098	Elm, American	7	2-Good	3-Fair	
1099	Ash, White	11	2-Good	3-Fair	
1100	Ash, White	11	2-Good	3-Fair	
1101	Basswood, American	16	3-Fair	4-Poor	
1102	Basswood, American	13	3-Fair	3-Fair	
1103	Basswood, American	13	3-Fair	3-Fair	
1104	Basswood, American	13	3-Fair	3-Fair	
1105	Basswood, American	13	3-Fair	3-Fair	
1106	Elm, American	8	3-Fair	3-Fair	
1107	Basswood, American	6	3-Fair	3-Fair	
1108	Basswood, American	7	3-Fair	3-Fair	
1109	Basswood, American	7	3-Fair	3-Fair	
1110	Basswood, American	7	3-Fair	3-Fair	
1111	Maple, Sugar	10	3-Fair	3-Fair	
1112	Basswood, American	10	3-Fair	3-Fair	
1113	Basswood, American	7	3-Fair	3-Fair	
1114	Oak, Northern Red	16	3-Fair	3-Fair	
1115	Basswood, American	9	3-Fair	3-Fair	
1116	Oak, Northern Red	11	3-Fair	3-Fair	
1117	Oak, Northern Red	10	3-Fair	3-Fair	
1118	Basswood, American	10	3-Fair	3-Fair	
1119	Basswood, American	6	3-Fair	3-Fair	
1120	Maple, Sugar	12	3-Fair	3-Fair	
1121	Oak, White	27	2-Good	3-Fair	
1122	Oak, Black	24	4-Poor	3-Fair	
1123	Elm, American	9	3-Fair	3-Fair	
1124	Oak, White	24	2-Good	3-Fair	
1125	Maple, Sugar	12	3-Fair	3-Fair	
1126	Elm, American	15	2-Good	2-Good	
1127	Elm, American	9	3-Fair	3-Fair	
1128	Maple, Sugar	7	3-Fair	3-Fair	
1129	Maple, Sugar	7	3-Fair	3-Fair	
1130	Maple, Sugar	7	3-Fair	3-Fair	

1131	Maple, Sugar	7	3-Fair	3-Fair	
1132	Maple, Sugar	7	3-Fair	3-Fair	
1133	Maple, Sugar	8	3-Fair	3-Fair	
1134	Oak, Northern Red	8	3-Fair	3-Fair	
1135	Maple, Sugar	7	3-Fair	3-Fair	
1136	Oak, Northern Red	6	4-Poor	3-Fair	
1137	Basswood, American	7	2-Good	2-Good	
1138	Basswood, American	7	2-Good	2-Good	
1139	Elm, American	8	2-Good	2-Good	
1140	Maple, Sugar	6	3-Fair	3-Fair	
1141	Basswood, American	11	5-Dead	5-Dead	
1142	Oak, Northern Red	9	4-Poor	3-Fair	
1143	Oak, Northern Red	16	4-Poor	3-Fair	
1144	Basswood, American	7	3-Fair	3-Fair	
1145	Oak, Northern Red	15	3-Fair	3-Fair	
1146	Oak, Northern Red	12	3-Fair	2-Good	
1147	Basswood, American	7	3-Fair	2-Good	
1148	Oak, Northern Red	27	2-Good	2-Good	
1149	Elm, American	11	2-Good	2-Good	
1150	Elm, American	7	3-Fair	2-Good	
1151	Oak, Northern Red	10	2-Good	2-Good	
1152	Maple, Sugar	7	2-Good	2-Good	
1153	Hickory, Bitternut	7	2-Good	2-Good	
1154	Ash, White	7	2-Good	2-Good	
1155	Elm, American	6	2-Good	2-Good	
1156	Elm, American	8	2-Good	2-Good	
1158	Ash, White	24	2-Good	2-Good	
1157	Ash, White	24	2-Good	3-Fair	
1159	Ash, White	15	3-Fair	3-Fair	
1160	Ash, White	10	3-Fair	3-Fair	
1161	Ash, White	19	2-Good	3-Fair	
1162	Ash, White	8	3-Fair	3-Fair	
1163	Maple, Sugar	6	3-Fair	3-Fair	
1164	Maple, Sugar	6	3-Fair	3-Fair	
1165	Maple, Sugar	7	3-Fair	3-Fair	
1166	Maple, Sugar	9	3-Fair	3-Fair	
1168	Oak, White	34	2-Good	3-Fair	
1167	Oak, White	9	3-Fair	3-Fair	
1169	Basswood, American	9	4-Poor	3-Fair	
1170	Elm, American	7	4-Poor	4-Poor	
1171	Oak, Northern Red	24	4-Poor	3-Fair	
1172	Maple, Sugar	8	2-Good	2-Good	
1173	Elm, American	7	3-Fair	3-Fair	
1174	Oak, White	23	2-Good	3-Fair	
1175	Basswood, American	13	3-Fair	3-Fair	
1176	Oak, White	23	2-Good	3-Fair	
1177	Maple, Sugar	8	3-Fair	2-Good	
1178	Oak, White	25	2-Good	2-Good	
1179	Basswood, American	8	3-Fair	2-Good	
1180	Maple, Sugar	8	3-Fair	2-Good	
1181	Elm, American	8	5-Dead	5-Dead	
1182	Oak, White	29	2-Good	3-Fair	
1183	Elm, American	15	3-Fair	3-Fair	
1184	Hickory, Bitternut	7	3-Fair	3-Fair	
1185	Basswood, American	8	3-Fair	3-Fair	
1186	Oak, White	33	2-Good	3-Fair	
1187	Elm, American	6	3-Fair	3-Fair	
1188	Elm, American	8	3-Fair	3-Fair	
1189	Elm, American	6	3-Fair	3-Fair	
1190	Elm, American	8	3-Fair	3-Fair	
1191	Elm, American	8	3-Fair	3-Fair	
1192	Elm, American	8	3-Fair	3-Fair	
1193	Elm, American	8	3-Fair	3-Fair	
1194	Oak, Northern Red	21	2-Good	2-Good	
1195	Oak, White	33	2-Good	2-Good	
1196	Maple, Sugar	6	3-Fair	2-Good	
1197	Maple, Sugar	8	3-Fair	3-Fair	
1198	Basswood, American	15	3-Fair	3-Fair	
1199	Hickory, Bitternut	6	3-Fair	3-Fair	
1200	Elm, American	8	4-Poor	5-Dead	
1201	Elm, American	10	5-Dead	5-Dead	
1202	Elm, American	15	2-Good	2-Good	
1203	Maple, Sugar	6	2-Good	2-Good	
1204	Maple, Sugar	7	2-Good	2-Good	
1205	Hickory, Bitternut	12	2-Good	2-Good	
1206	Hickory, Bitternut	8	2-Good	2-Good	
1207	Elm, American	6	5-Dead	5-Dead	X
1208	Oak, White	29	2-Good	2-Good	
1209	Basswood, American	7	2-Good	2-Good	
1210	Basswood, American	9	2-Good	2-Good	
1211	Basswood, American	11	2-Good	2-Good	
1212	Basswood, American	9	2-Good	2-Good	
1213	Elm, American	10	5-Dead	5-Dead	



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STATE OF MINNESOTA.

JERREMY D. FOSS

DATE: LIC. NO. 55871

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PROJECT

LENNAR

RESERVE AT
AUTUMN WOODS

CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	21-24984
FILE NAME	24984 TREE PRES
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

TITLE

TREE SURVEY C

SHEET

46

OF 47

Tree Tag Number	Tree Species	DBH (Inches)	Structural Condition	Health Condition	Removals
1212	Basswood, American	9	2-Good	2-Good	
1213	Elm, American	10	5-Dead	5-Dead	
1214	Elm, American	7	5-Dead	5-Dead	
1215	Oak, Bur	41	1-Excellent	2-Good	
1216	Ash, White	8	2-Good	2-Good	
1217	Ash, White	8	2-Good	2-Good	
1218	Elm, American	8	3-Fair	3-Fair	
1219	Elm, American	9	5-Dead	5-Dead	
1220	Oak, Bur	29	2-Good	2-Good	
1221	Oak, Bur	34	1-Excellent	2-Good	
1222	Elm, American	7	5-Dead	5-Dead	
1223	Elm, American	10	3-Fair	3-Fair	
1224	Elm, American	6	3-Fair	3-Fair	
1225	Elm, American	6	5-Dead	5-Dead	
1226	Elm, American	6	3-Fair	3-Fair	
1227	Oak, White	29	2-Good	3-Fair	
1228	Basswood, American	13	3-Fair	3-Fair	
1229	Basswood, American	21	2-Good	3-Fair	
1230	Basswood, American	9	3-Fair	3-Fair	
1231	Hackberry	6	3-Fair	3-Fair	
1232	Oak, Northern Red	12	3-Fair	3-Fair	
1233	Ash, White	13	3-Fair	3-Fair	
1234	Maple, Sugar	9	3-Fair	3-Fair	
1235	Maple, Sugar	13	3-Fair	3-Fair	
1236	Hackberry	20	2-Good	3-Fair	
1237	Elm, American	16	5-Dead	3-Fair	
1238	Maple, Sugar	7	3-Fair	3-Fair	
1239	Hackberry	14	3-Fair	3-Fair	
1240	Maple, Sugar	24	2-Good	3-Fair	
1241	Maple, Sugar	6	3-Fair	3-Fair	
1242	Maple, Sugar	10	3-Fair	3-Fair	
1243	Elm, American	8	5-Dead	5-Dead	
1244	Maple, Sugar	7	3-Fair	3-Fair	
1245	Maple, Sugar	6	3-Fair	3-Fair	
1246	Oak, White	20	2-Good	3-Fair	
1247	Maple, Sugar	10	3-Fair	3-Fair	
1248	Maple, Sugar	10	3-Fair	3-Fair	
1249	Oak, White	15	3-Fair	3-Fair	
1250	Maple, Sugar	7	3-Fair	3-Fair	
1251	Maple, Sugar	7	3-Fair	3-Fair	
1252	Maple, Sugar	8	3-Fair	3-Fair	
1253	Maple, Sugar	10	3-Fair	3-Fair	
1254	Oak, Northern Red	14	3-Fair	3-Fair	
1255	Oak, White	19	2-Good	3-Fair	
1256	Maple, Sugar	8	3-Fair	3-Fair	
1257	Elm, American	10	5-Dead	5-Dead	
1258	Maple, Sugar	7	3-Fair	3-Fair	
1259	Maple, Sugar	7	3-Fair	3-Fair	
1260	Maple, Sugar	7	3-Fair	3-Fair	
1261	Hackberry	10	3-Fair	3-Fair	
1262	Maple, Sugar	10	3-Fair	3-Fair	
1263	Basswood, American	6	3-Fair	3-Fair	
1264	Oak, White	21	2-Good	3-Fair	
1265	Maple, Sugar	12	3-Fair	3-Fair	
1266	Maple, Sugar	9	3-Fair	3-Fair	
1267	Maple, Sugar	13	3-Fair	3-Fair	
1268	Oak, White	13	3-Fair	3-Fair	
1269	Maple, Sugar	8	3-Fair	3-Fair	
1270	Maple, Sugar	6	3-Fair	3-Fair	
1271	Oak, White	27	2-Good	3-Fair	
1272	Oak, White	16	3-Fair	3-Fair	
1273	Maple, Sugar	16	3-Fair	3-Fair	
1274	Maple, Sugar	7	3-Fair	3-Fair	
1275	Hackberry	13	3-Fair	3-Fair	
1276	Maple, Sugar	14	3-Fair	3-Fair	
1277	Maple, Sugar	7	3-Fair	3-Fair	
1278	Maple, Sugar	7	3-Fair	3-Fair	
1279	Maple, Sugar	19	2-Good	3-Fair	
1280	Ash, White	18	2-Good	3-Fair	
1281	Oak, White	11	3-Fair	3-Fair	X
1282	Oak, White	10	3-Fair	3-Fair	X
1283	Ash, White	15	3-Fair	3-Fair	X
1284	Maple, Sugar	13	3-Fair	3-Fair	
1285	Maple, Sugar	8	3-Fair	3-Fair	
1286	Maple, Sugar	7	3-Fair	3-Fair	
1287	Maple, Sugar	10	3-Fair	3-Fair	
1288	Maple, Sugar	7	3-Fair	3-Fair	
1289	Maple, Sugar	7	3-Fair	3-Fair	
1290	Maple, Sugar	8	3-Fair	2-Good	
1291	Maple, Sugar	7	3-Fair	3-Fair	
1292	Maple, Sugar	8	3-Fair	3-Fair	
1293	Maple, Sugar	11	3-Fair	3-Fair	

1294	Maple, Sugar	15	3-Fair	3-Fair	
1295	Maple, Sugar	13	3-Fair	3-Fair	
1296	Maple, Sugar	6	3-Fair	3-Fair	
1297	Maple, Sugar	8	3-Fair	3-Fair	
1298	Maple, Sugar	11	3-Fair	3-Fair	
1299	Maple, Sugar	11	3-Fair	3-Fair	
1300	Maple, Sugar	13	3-Fair	3-Fair	
1301	Maple, Sugar	16	3-Fair	3-Fair	
1302	Maple, Sugar	11	3-Fair	3-Fair	
1303	Oak, White	25	2-Good	3-Fair	
1304	Ash, White	6	3-Fair	3-Fair	
1305	Maple, Sugar	9	3-Fair	3-Fair	
1306	Maple, Sugar	6	3-Fair	3-Fair	
1307	Maple, Sugar	8	3-Fair	3-Fair	
1308	Maple, Sugar	6	3-Fair	3-Fair	
1309	Ironwood	20	2-Good	3-Fair	
1310	Elm, American	21	2-Good	3-Fair	
1311	Oak, White	13	3-Fair	3-Fair	
1312	Elm, American	14	3-Fair	3-Fair	
1313	Oak, White	18	2-Good	3-Fair	
1314	Elm, American	15	3-Fair	3-Fair	
1315	Oak, White	15	3-Fair	3-Fair	
1316	Maple, Sugar	7	3-Fair	3-Fair	
1317	Maple, Sugar	13	3-Fair	3-Fair	
1318	Oak, Northern Red	15	3-Fair	3-Fair	
1319	Maple, Sugar	6	3-Fair	3-Fair	
1320	Maple, Sugar	9	3-Fair	3-Fair	
1321	Maple, Sugar	13	3-Fair	3-Fair	
1322	Maple, Sugar	9	3-Fair	3-Fair	
1323	Maple, Sugar	8	3-Fair	3-Fair	
1324	Maple, Sugar	8	3-Fair	3-Fair	
1325	Maple, Sugar	9	3-Fair	3-Fair	
1326	Oak, Northern Red	20	2-Good	3-Fair	
1327	Oak, Northern Red	11	3-Fair	3-Fair	
1328	Maple, Sugar	17	3-Fair	3-Fair	
1329	Maple, Sugar	6	3-Fair	3-Fair	
1330	Oak, Northern Red	26	2-Good	3-Fair	
1331	Oak, Northern Red	13	3-Fair	3-Fair	
1332	Maple, Sugar	9	5-Dead	5-Dead	
1333	Maple, Sugar	8	5-Dead	5-Dead	
1334	Maple, Sugar	9	3-Fair	3-Fair	
1335	Elm, American	10	3-Fair	4-Poor	
1336	Ash, White	6	3-Fair	3-Fair	
1337	Ash, White	6	3-Fair	3-Fair	
1338	Ash, White	9	3-Fair	3-Fair	
1339	Ash, White	12	3-Fair	3-Fair	
1340	Ash, White	12	3-Fair	3-Fair	
1341	Ash, White	11	3-Fair	3-Fair	
1342	Ash, White	29	2-Good	3-Fair	
1344	Elm, American	13	3-Fair	3-Fair	
1343	Ash, White	29	2-Good	3-Fair	
1345	Elm, American	7	3-Fair	3-Fair	
1346	Ash, White	9	3-Fair	3-Fair	X
1347	Elm, American	11	3-Fair	3-Fair	X
1348	Ash, White	12	3-Fair	3-Fair	X
1349	Ash, White	10	3-Fair	3-Fair	X
1350	Ash, White	9	3-Fair	3-Fair	X
1351	Ash, White	26	2-Good	3-Fair	X
1352	Maple, Sugar	9	3-Fair	3-Fair	X
1353	Ash, White	16	3-Fair	3-Fair	X
1354	Hickory, Bitternut	8	3-Fair	3-Fair	X
1355	Ash, White	9	3-Fair	3-Fair	
1356	Maple, Sugar	7	3-Fair	3-Fair	
1357	Elm, American	17	3-Fair	3-Fair	
1358	Oak, White	8	3-Fair	3-Fair	
1359	Oak, White	32	2-Good	3-Fair	
1360	Ash, White	8	3-Fair	3-Fair	
1361	Maple, Sugar	6	3-Fair	3-Fair	
1362	Ash, White	7	3-Fair	3-Fair	
1363	Ash, White	7	3-Fair	3-Fair	
1364	Ash, White	11	3-Fair	3-Fair	
1365	Ash, White	14	3-Fair	3-Fair	
1366	Ash, White	7	3-Fair	3-Fair	X
1367	Ash, White	12	3-Fair	3-Fair	X
1368	Ash, White	11	3-Fair	3-Fair	X
1369	Ash, White	11	3-Fair	3-Fair	X
1370	Elm, American	8	3-Fair	3-Fair	X
1371	Oak, Northern Red	17	3-Fair	3-Fair	X
1372	Oak, Northern Red	15	3-Fair	3-Fair	X
1373	Maple, Sugar	12	3-Fair	3-Fair	X
1374	Maple, Sugar	11	3-Fair	3-Fair	X
1375	Ash, White	8	3-Fair	3-Fair	X
1376	Hackberry	12	3-Fair	3-Fair	X
1377	Hackberry	17	3-Fair	3-Fair	X

1378	Hackberry	7	3-Fair	3-Fair	X
1379	Ash, White	6	3-Fair	3-Fair	X
1380	Boxelder	10	3-Fair	3-Fair	X
1381	Elm, American	8	5-Dead	5-Dead	X
1382	Ash, White	7	3-Fair	3-Fair	X
1383	Ash, White	7	3-Fair	3-Fair	X
1384	Boxelder	9	3-Fair	3-Fair	X
1385	Ash, White	13	3-Fair	3-Fair	
1386	Hickory, Bitternut	6	3-Fair	3-Fair	
1387	Ash, White	20	2-Good	3-Fair	
1388	Ash, White	11	3-Fair	3-Fair	
1389	Maple, Sugar	10	3-Fair	3-Fair	
1390	Elm, American	7	5-Dead	5-Dead	
1391	Ash, White	13	3-Fair	3-Fair	
1392	Ash, White	8	3-Fair	3-Fair	
1393	Ash, White	8	3-Fair	3-Fair	
1394	Ash, White	10	3-Fair	3-Fair	
1395	Ash, White	8	3-Fair	3-Fair	
1396	Hackberry	13	3-Fair	3-Fair	
1397	Maple, Sugar	8	3-Fair	3-Fair	
1398	Maple, Sugar	8	3-Fair	3-Fair	
1399	Oak, Northern Red	8	3-Fair	3-Fair	
1400	Oak, White	23	2-Good	3-Fair	
1401	Oak, White	22	2-Good	3-Fair	
1402	Oak, Northern Red	10	3-Fair	3-Fair	
1403	Oak, White	33	2-Good	3-Fair	
1404	Oak, White	39	2-Good	3-Fair	
1405	Boxelder	8	3-Fair	3-Fair	
1406	Maple, Sugar	10	3-Fair	3-Fair	
1407	Maple, Sugar	6	3-Fair	3-Fair	
1408	Ash, White	6	3-Fair	3-Fair	
1409	Oak, Northern Red	25	2-Good	3-Fair	X
1410	Elm, American	7	3-Fair	3-Fair	
1411	Ash, White	9	3-Fair	3-Fair	
1412	Cherry, Black	9	3-Fair	3-Fair	
1413	Maple, Sugar	7	3-Fair	3-Fair	
1414	Maple, Sugar	7	3-Fair	3-Fair	
1415	Maple, Sugar	7	3-Fair	3-Fair	
1416	Maple, Sugar	9	4-Poor	3-Fair	
1417	Elm, American	6	3-Fair	3-Fair	
1418	Oak, White	37	2-Good	3-Fair	
1419	Elm, American	8	3-Fair	3-Fair	
1420	Elm, American	7	3-Fair	3-Fair	
1421	Elm, American	10	3-Fair	3-Fair	
1422	Oak, White	36	2-Good	3-Fair	
1423	Elm, American	10	5-Dead	5-Dead	
1424	Elm, American	10	3-Fair	3-Fair	
1425	Elm, American	14	3-Fair	3-Fair	
1426	Elm, American	13	3-Fair	3-Fair	
1427	Ash, White	14	3-Fair	3-Fair	
1428	Elm, American	7	3-Fair	3-Fair	
1429	Ash, White	11	3-Fair	3-Fair	
1430	Ash, White	7	3-Fair	3-Fair	
1431	Oak, White	30	2-Good	3-Fair	
1432	Ash, White	20	2-Good	3-Fair	
1433	Maple, Sugar	10	3-Fair	3-Fair	

TREE PRESERVATION SUMMARY

722 SURVEYED TREES MEETING ORDINANCE THRESHOLD
148 TOTAL PROPOSED REMOVALS

SIGNIFICANT TREES
262 TOTAL
46 PROPOSED REMOVAL, 7 OF WHICH ARE DEAD

Studied Intersection Description and Location

This Traffic Impact Analysis (TIA) studied current, projected, and future traffic conditions at eight locations in the City of Chaska, Carver County, Minnesota. These locations included:

- Intersection 1 – The intersection of Autumn Woods Drive and Audubon Road (CSAH 15)
- Intersection 2 – The intersection of Butternut Drive and Audubon Road (CSAH 15)
- Intersection 3 – The intersection of Butternut Drive and Ironwood Boulevard
- Intersection 4 – The intersection of Ironwood Boulevard and Autumn Woods Drive
- Intersection 5 – The intersection of Acorn Road and Autumn Woods Drive
- Intersection 6 – The intersection of Autumn Woods Drive and Access A
- Intersection 7 – The intersection of Audubon Road (CSAH 15) and Access B
- Intersection 8 – The intersection of Acorn Road and Pioneer Road (CSAH 14)

Traffic counts were collected for this study and at the time of the counts, mask mandates were lifted, businesses were open, and many locations are transitioning back to working in the office as part of the “dial-back” order by the governor of Minnesota. On May 7th, 2021 MnDOT traffic operations reported that traffic volumes are within 10% of pre-pandemic levels within the metro.

Traffic counts were collected on May 25th, 2021 at intersections 1, 2,3,4, and 5 from 6:00 AM - 10:00 AM and from 2:30 PM – 6:30 PM. The traffic counts contained passenger vehicle, heavy vehicle, pedestrian, and bicycle volumes & turning movements. The counts were performed on a Tuesday intentionally to avoid any distant learning occurring on Wednesdays for the school district. To avoid lower volume traffic that may occur due to weekend travel, Monday, Fridays, and days abutting a Holiday were avoided. Lastly, school was in session during the counts and buses were counted as heavy vehicles for the study.

Findings

The TIA assumed the following improvements would be made by the time the proposed development was completed:

- The addition of a turn lane on Autumn Woods Drive has been added to all scenarios (1, 2, and 3), allowing a dedicated left and right turn.
- A left-turn lane has been added on Audubon (CSAH 15) at Intersection 1 (Autumn Woods Drive & Audubon Road (CSAH 15)).

The report explored three scenarios of connectivity for proposed development:

- **Scenario 1:** The development will be served through two established accesses on the north and east of the property. A full access constructed at the north of the development, connecting to Autumn Woods Drive (Intersection 6 – enter and exiting travel) and a right-out only access (Intersection 7 – exit only travel) providing direct access to Audubon Road (CSAH 15). This scenario would not utilize the extension of Ironwood Boulevard (Intersection 3), on the southern property border, which appeared to be extended for the future development during the construction of the existing residential development.
- **Scenario 2:** Traffic would enter and exit the development through three established accesses on the north, east, and south of the property. The scenario would mimic Scenario 1 establishing Intersections 6 and 7 and would connect to the existing stub of Ironwood Boulevard (Intersection 3 – enter and exiting travel).
- **Scenario 3:** Traffic would enter and exit the development through two full accesses at Autumn Woods Drive (Intersection 6) and Ironwood Boulevard (Intersection 3). The right-out onto Audubon Road (CSAH 15) would not be constructed (Intersection 7).

The background traffic growth throughout the development is expected to cause increased delays throughout the study area. As traffic continues to increase, longer delays will be experienced but will be minor with the exception of the eastbound approach at Intersection 1. The approach is currently operating at a low LOS and experiencing delays due to the high traffic volume on the major approaches of Audubon Road (CSAH 15). If Intersection 1 is not improved, it is likely that traffic will naturally redistribute throughout the site and a higher volume of traffic will route to Intersection 2 to enter the residential development.

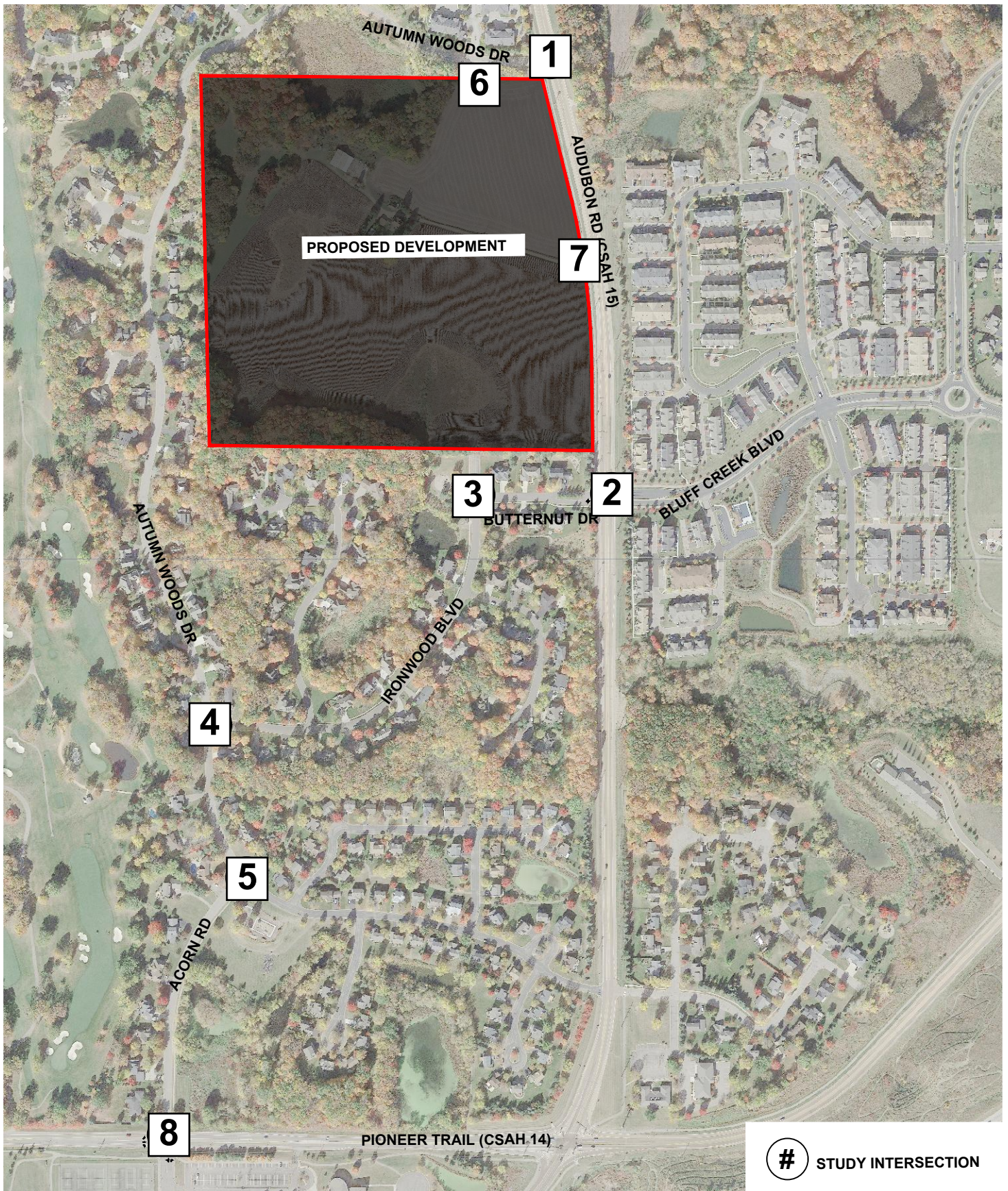
- Intersection 1 will continue to function at a LOS A with the eastbound approach declining from LOS C to LOS E as delays increase. The eastbound approach will decline in Level of Service from projected background traffic and experience similar delays without the proposed residential development.
- Intersection 2, 3, 4, 5, 6, 7 will operate at a LOS A for all scenarios.
- Intersection 8 is currently operating at a LOS B with delays experienced by the eastbound and westbound traffic. As background traffic continues to increase, the approaches will experience longer delays. The traffic queue lengths are not expected to exceed storage bay capacities, but the Intersection signal timing can be updated to shorten the delays experienced.
- Modifying cycle lengths and split times can further improve LOS and delay at the signalized intersections.

Recommendations

- To better serve the eastbound traffic at Intersection 1, it is recommended that dedicated left and right turn lanes be constructed for the eastbound traffic with the proposed development.
- To reduce the delay expected at the Intersection 1, proceeding with Scenario 3 is recommended. The right-out access at Intersection 7 (Scenario 2) does not provide a significant impact in decreasing delays or improving the LOS across the study area.
 - Intersection 1 is recommended to be signed as a two-way stop-controlled intersection for the northbound and southbound approach.
 - Intersection 3 is recommended to be signed with yield signs for the northbound and southbound approach.
- The traffic signals at Intersections 2 and 8 should be reevaluated to optimize signal timing every 5 years or as future development occurs.
- The existing and proposed residential development serves pedestrian and bicycles throughout the study area with shared use trails, sidewalks, and parks. In addition, there a series of bus stops throughout the study area. To accommodate pedestrian and cyclist, the follow items may be considered by Jonathon Association and the City of Chaska regardless of the construction of the proposed development:
 - Install sidewalk along Autumn Woods Drive. The existing Autumn Woods development has an HOA with Jonathon Association. The Association and City may need to coordinate these improvements.
 - To address resident concerns of vehicles traveling above the speed limit throughout the development, the City and HOA may consider installing speed bumps mid-block of intersections to reduce travel speeds in the interim until sidewalk is constructed. Secondly, speed limit signs could be installed throughout the existing and proposed development.
 - Stripe pedestrian crosswalks at intersections to increase visibility to drivers. Additionally, ensure between the HOA and City that sight triangles for all intersections are not impeded by vegetation. Once pedestrian facilities are installed at the proposed development, a similar agreement should be established. Bicycle and pedestrian signage can also be established throughout the study area.
 - Where shared use trails are not provided and the existing roadway is wide enough, limit on-street parking and stripe bicycle lanes throughout the existing development.

Carver County Comments – 8-21-2021:

With the updated analysis and inclusion of dedicated left and right turn lanes on the Autumn Woods and Butternut approaches to Audubon, the delay has been significantly reduced to LOS E or about 40 seconds of delay at the worst for Alternative (Scenario) 1. Alternative (Scenario) 3 with the connection to Ironwood has the best LOS on opening day and in 20 years. Based on this information, there are no warrants to justify additional investments in intersection traffic control on Audubon such as another signal or roundabout. Alternative (Scenario) 3 is the most resilient since it provides options to the residents to access Audubon. Alternative (Scenario) 3 should be considered the recommended alternative as it has an acceptable LOS of D at worst. The traffic volume is not that significant from this proposed development as compared to the whole of the area and large volume on Audubon today.



STUDY INTERSECTION

INTERSECTION MAP

0 250 500
SCALE: 1" = 500 FEET



ISG

Architecture + Engineering + Environmental + Planning

9.B. Adopt Resolution 2021-67 and...

Packet Page 110 of...

Page 86 of...

CAD FILE NAME: 24984 INTERSECTION EY-8175

Lennar Wagner Woods

Chaska, MN - 05/20/2021

ISG PROJECT NO. 2021-24984

DRAFT

TRAFFIC IMPACT ANALYSIS - DRAFT

Reserve at Autumn Woods
Chaska, MN

September 3rd, 2021

Project No. 21-24984



Architecture
Engineering
Environmental
Planning
ISGInc.com

REPORT FOR:
LENNAR HOMES
Josh Metzger
Land Development Manager

FROM:
ISG
Jerremy D. Foss, P.E.
7900 International Dr., Suite 550
Bloomington, MN 55425

SIGNATURE SHEET

I HEREBY CERTIFY THAT THESE CALCULATIONS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

Jeremy D. Foss PE,
Project Engineer
License No. 55871
My license renewal date is June 30, 2022
Documents covered by this seal:
Reserve at Autumn Woods Residential Development Traffic Impact Analysis

ISG
7900 International Dr., Suite 550
Bloomington, MN 55425

**Reserve at Autumn Woods Residential Development
Chaska, Minnesota**

Engineer's Project Number: 21-24984

Dated this 3rd day of September 2021

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EXECUTIVE SUMMARY

Studied Intersection Description and Location

This study has been prepared in anticipation of the proposed Reserve at Autumn Woods residential development, formally known as the Wagner Property. The site is currently farmed and has an existing homestead and miscellaneous buildings throughout the property. The property is located within the existing Autumn Woods residential development with direct access to Audubon Road / County State Aid Highway (CSAH) 15 and indirect access to Pioneer Trail (CSAH 14). Audubon Road (CSAH 15) is the City Limit between the City of Chaska and the City of Chanhassen.

The development is anticipated to be a low-density residential property consisting of 87 units within 45-acres. Construction for the new residential development is expected to commence in Fall of 2021 and continue into 2022. The development is expected to be open and operating in Spring of 2023. Additional growth is anticipated within the neighboring area and throughout the county. Additional information pertaining to growth trends along Audubon Road (CSAH 15), Pioneer Trail (CSAH 14) and other roadways surrounding the development can be found within the **Roadway Historical Growth Rate** section of this report.

This Traffic Impact Analysis (TIA) studied current, projected, and future traffic conditions at eight locations in the City of Chaska, Carver County, Minnesota. These locations included:

- Intersection 1 – The intersection of Autumn Woods Drive and Audubon Road (CSAH 15)
- Intersection 2 – The intersection of Butternut Drive and Audubon Road (CSAH 15)
- Intersection 3 – The intersection of Butternut Drive and Ironwood Boulevard
- Intersection 4 – The intersection of Ironwood Boulevard and Autumn Woods Drive
- Intersection 5 – The intersection of Acorn Road and Autumn Woods Drive
- Intersection 6 – The intersection of Autumn Woods Drive and Access A
- Intersection 7 – The intersection of Audubon Road (CSAH 15) and Access B
- Intersection 8 – The intersection of Acorn Road and Pioneer Road (CSAH 14)

It should be noted that at the time of writing, the COVID-19 virus pandemic has ongoing impacts on travel behavior, although COVID-19 restrictions have begun to lift. As a result, the collected data is most likely impacted by the subsiding effects of the pandemic with working from home and distance learning becoming typical. Traffic counts were collected for this study and at the time of the counts, mask mandates were lifted, businesses were open, and many locations are transitioning back to working in the office as part of the “dial-back” order by the governor of Minnesota. It is unknown when local travel patterns will return to what was considered normal pre-COVID-19. On May 7th, 2021 MnDOT traffic operations reported that traffic volumes are within 10% of pre-pandemic levels within the metro.

Traffic counts were collected on May 25th, 2021 at intersections 1, 2, 3, 4, and 5 from 6:00 AM - 10:00 AM and from 2:30 PM – 6:30 PM. The traffic counts contained passenger vehicle, heavy vehicle, pedestrian, and bicycle volumes & turning movements. The counts were performed on a Tuesday intentionally to avoid any distant learning occurring on Wednesdays for the school district. To avoid lower volume traffic that may occur due to weekend travel, Monday, Fridays, and days abutting a Holiday were avoided. Lastly, school was in session during the counts and buses were counted as heavy vehicles for the study. Additional information pertaining to the intersections can be found within the **Area Roadway System** section of this report.

Findings

For the completed traffic study, multiple scenarios were evaluated using version 11 Synchro and SimTraffic traffic modeling software. The report will explore three scenarios of connectivity for proposed development:

- Scenario 1: Traffic would enter and exit the development through two established accesses on the north and east of the property. A full access constructed at the north of the development, connecting to Autumn Woods Drive (Intersection 6) and a right-out only access (Intersection 7) providing direct access to Audubon Road (CSAH 15). This scenario would not utilize the extension of Ironwood Boulevard (Intersection 3), on the southern property border, which appeared to be extended for the future development during the construction of the existing residential development.
- Scenario 2: Traffic would enter and exit the development through three established accesses on the north, east, and south of the property. The scenario would mimic Scenario 1 establishing Intersections 6 and 7 and would connect to the existing stub of Ironwood Boulevard (Intersection 3).
- Scenario 3: Traffic would enter and exit the development through two full accesses at Autumn Woods Drive (Intersection 6) and Ironwood Boulevard (Intersection 3). The right-out onto Audubon Road (CSAH 15) would not be constructed (Intersection 7).

The background traffic growth throughout the development is expected to cause increased delays throughout the study area. As traffic continues to increase, longer delays will be experienced but will be minor with the exception of the eastbound approach at Intersection 1. The approach is currently operating at a low LOS and experiencing delays due to the high traffic volume on the major approaches of Audubon Road (CSAH 15). If Intersection 1 is not improved, it is likely that traffic will naturally redistribute throughout the site and a higher volume of traffic will route to Intersection 2 to enter the residential development.

According to the completed traffic modeling, the new traffic generated as a result of the proposed residential development will increase to varying degrees at the studied intersections;

- Intersection 1 will continue to function at a LOS A with the eastbound approach declining from LOS C to LOS E as delays increase. The eastbound approach will decline in Level of Service from projected background traffic and experience similar delays without the proposed residential development.
- Intersection 2, 3, 4, 5, 6, 7 will operate at a LOS A for all scenarios.
- Intersection 8 is currently operating at a LOS B with delays experienced by the eastbound and westbound traffic. As background traffic continues to increase, the approaches will experience longer delays. The traffic queue lengths are not expected to exceed storage bay capacities, but the Intersection signal timing can be updated to shorten the delays experienced.

Modifying cycle lengths and split times can further improve LOS and delay at the signalized intersections. Additional discussion on delay and LOS is provided within the **Traffic Analysis** section of this report.

Recommendations

It is recommended that;

- To better serve the eastbound traffic at Intersection 1, it is recommended that dedicated left and right turn lanes be constructed for the eastbound traffic with the proposed development.
- To reduce the delay expected at the Intersection 1, proceeding with Scenario 3 is recommended. The right-out access at Intersection 7 (Scenario 2) does not provide a significant impact in decreasing delays or improving the LOS across the study area.
 - Intersection 1 is recommended to be signed as a two-way stop-controlled intersection for the northbound and southbound approach.
 - Intersection 3 is recommended to be signed with yield signs for the northbound and southbound approach.
- The traffic signals at Intersections 2 and 8 should be reevaluated to optimize signal timing every 5 years or as future development occurs.
- The existing and proposed residential development serves pedestrian and bicycles throughout the study area with shared use trails, sidewalks, and parks. In addition, there a series of bus stops throughout the study area. To accommodate pedestrian and cyclist, the follow items may be considered by Jonathon Association and the City of Chaska regardless of the construction of the proposed development:
 - Install sidewalk along Autumn Woods Drive. The existing Autumn Woods development has an HOA with Jonathon Association. The Association and City may need to coordinate these improvements.
 - To address resident concerns of vehicles traveling above the speed limit throughout the development, the City and HOA may consider installing speed bumps mid-block of intersections to reduce travel speeds in the interim until sidewalk is constructed. Secondly, speed limit signs could be installed throughout the existing and proposed development.
 - Stripe pedestrian crosswalks at intersections to increase visibility to drivers. Additionally, ensure between the HOA and City that sight triangles for all intersections are not impeded by vegetation. Once pedestrian facilities are installed at the proposed development, a similar agreement should be established. Bicycle and pedestrian signage can also be established throughout the study area.
 - Where shared use trails are not provided and the existing roadway is wide enough, limit on-street parking and stripe bicycle lanes throughout the existing development.

Additional discussion on delay and LOS is provided within the **Recommendations** section of this report.

INTRODUCTION

Purpose of Report

The purpose of this report is to document the methodologies, findings, recommendations, and conclusions of the Wagner Woods residential development traffic impact analysis study, including the basis for all assumptions, traffic parameters, and conclusions. This report presents data in a logical format including tables and figures in order to accurately and clearly convey the data and its meaning.

Study Objectives

The objectives of this study include the following:

1. Provide sufficient access for the proposed development.
2. Identify the impacts to the transportation system and immediate area as a result of the proposed development.
3. Recommend necessary improvements to the adjacent transportation system to minimize crash risk and maintain an efficient system.

EXISTING CONDITIONS

Housing Data, Zoning, and Land Use

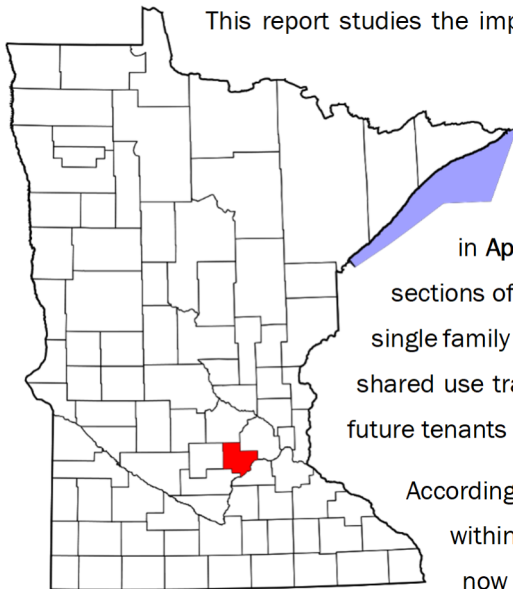


Figure 1 Carver County within the state of Minnesota.

This report studies the impacts of a proposed residential development in the City of Chaska, Carver County, Minnesota. A preliminary site plan is provided in **Appendix A** as “Concept G-1”. The concept is a representation of Scenario 3. Three Scenarios will be analyzed within this report and are explained within this section and the **Proposed Conditions** of this report. A project location and roadway function classification map are provided in **Appendix B**. More details regarding site traffic and trip generation are provided in later sections of this report. The Reserve at Autumn Woods development is anticipate to facilitate 87 single family home units, with sidewalks on both side of the proposed roadway, and interconnected shared use trails that connect to the existing Autumn Woods development and proposed park to future tenants within the City of Chaska.

According to the 2040 Carver County Transportation Plan, due to the limit availability of space within the metro, it is anticipated that the Carver County will experience a significant growth now until 2040. Annually the growth has been anticipated to be between 1-3 percent. This assumption was consistent with the City of Chaska’s 2040 Comprehensive Plan which projects 4,188 new households between 2017 and 2040. For this study growth was calculated based on historical MnDOT AADT and previously completed reporting from the City and County. The growth used for this study is explained within **Roadway Historical Growth Rate** section of this report in detail.

The intersections formed by Autumn Woods Drive, Audubon Road (CSAH 15), Butternut Drive / Bluff Creek Boulevard, Ironwood Boulevard, Acorn Road, and Pioneer Trail (CSAH 14) were studied in this comprehensive traffic impact analysis. The figure in **Appendix C** identifies these intersections and illustrates their location within the City of Chaska.

The City of Chaska’s existing zoning map is provided in **Appendix D**. Land use of the proposed development property is zoned as Open Development. At the time of the study, all 87 lots will be single family homes that will be connected to the local roadway network by utilizing access from either Ironwood Boulevard (Intersection 3), Autumn Woods Drive, (Intersection 6) and Audubon Road (CSAH 15) (Intersection 7). The report will explore three scenarios of connectivity for proposed development:

- Scenario 1: Traffic would enter and exit the development through two established accesses on the north and east of the property. A full access constructed at the north of the development, connecting to Autumn Woods Drive (Intersection 6) and right-out only access (Intersection 7) providing direct access to Audubon Road (CSAH 15). This scenario would not utilize the stub of Ironwood Boulevard (Intersection 3), on the southern property border.
- Scenario 2: Traffic would enter and exit the development through three established accesses on the north (Intersection 6), east (Intersection 7), and south (Intersection 3) of the property. The scenario would mimic Scenario 1 and would connect the existing stub of Ironwood Boulevard (Intersection 3).
- Scenario 3: Traffic would enter and exit the development through two full access point at Autumn Woods Drive (Intersection 6) and Ironwood Boulevard (Intersection 3). The right-out onto Audubon Road (CSAH 15) (Intersection 7) would not be constructed.

The Carver County access spacing guidelines were referenced to ensure that Intersection 7, a right-out only access (Access B) is permitted along Audubon Road (CSAH 15) due to its close proximity to Intersections 1 and 2. Audubon Road (CSAH 15) is listed as a minor arterial roadway with primary intersections to be spaced every quarter mile and secondary intersections every eight mile in urban /urbanizing areas. A primary access is not allowed along Audubon (CSAH 15) and a secondary is permitted between the two intersections.

Area Roadway System

Through and adjacent to the study area:

- Audubon Road (CSAH 15) is an north-south county minor arterial roadway
- Pioneer Trail (CSAH 14) is an east-west county minor arterial roadway
- Autumn Woods Drive, Batternut Drive, Acorn Road, and Ironwood Boulevard are local roadways that comprise of the internal network of the existing Autumn Woods development

Minor Arterial Roadways and Connections to the Study Area

Both Audubon Road (CSAH 15) and Pioneer Trail (CSAH 14) are “A-Minor Expanders” within the Carver County roadway network. Minor arterials with regional importance are labeled with the letter grade due to their ability to relieve, expand, or complement the principal arterial system. The minor arterials connect urban service area with cities and towns outside the Twin Cities region and serve medium to long distance trips. Per the 2040 Carver County Comprehensive Plan, there is no intention to expand or provide additional improvements to Audubon Road (CSAH 15) or Pioneer Trail (CSAH 14).

The minor expanders are currently 2-lane undivided asphalt roadways. Audubon Road (CSAH 15) has a posted speed limit of 50 miles-per-hour (MPH) and Pioneer Trail has a posted speed limit of 45 MPH. Where local roads and driveway entrances access the arterial roadways, turn lanes are generally provided at the intersecting road feature. At the time of this study, a northbound left-turn lane on Audubon Road (CSAH 15) at Intersection 1 is planned to be striped and completed by the end

of Summer 2021. All Scenarios will be evaluated with the additional turn-lane as it may be constructed at the time of writing this report.

The nature of the roadways adjacent to the proposed residential development is considered urban/urbanizing as defined in the Minnesota Department of Transportation Access Management Manual. According to the Access Management Manual, a posted speed limit of 40–45 MPH is typical for a roadway with a land use or facility type of Urban/Urbanizing and functionally classified as a minor arterial.

The intersection of Autumn Woods Drive and Audubon Road (CSAH 15) (Intersection 1) form a stop-controlled t-intersection, with a stop sign on Autumn Woods Drive. Traffic along Audubon Road (CSAH 15) flows freely, there is a dedicated southbound right turn lane and no dedicated northbound left turn lane. Eastbound traffic on Autumn Woods Drive has one lane for left and right turning movements. In addition there is a shared use trail crossing on the eastbound approach. There is a designated crosswalk.

The intersection of Butternut Drive / Bluff Creek Boulevard and Audubon Road (CSAH 15) (Intersection 2) is a County signal-controlled intersection. The Intersection is on the City limit line for Chaska and Chanhassen, where the eastbound approach of the intersection is within the City of Chaska (Butternut Drive) and the westbound approach (Bluff Creek Boulevard) is within the City of Chanhassen. For the purpose of this study, the intersection shall be referred to as the Intersection of Butternut Drive and Audubon Road (CSAH 15). The intersection has designated pedestrian crossings across all intersection approaches that connect sidewalks and shared-use paths.

The intersection of Acorn Road and Pioneer Trail (CSAH 14) (Intersection 8) is a County signal-controlled intersection. The intersection is the southern outlet to the existing Autumn Woods development. The southern leg of the intersection provides access to Pioneer Ridge Middle School. The intersection has designated pedestrian crossing across the westbound and southbound approach that connects the sidewalk from Autumn Woods Drive to the school. In addition, there is a shared use trail that runs parallel to Pioneer Trail (CSAH 14).

Local Roadways and Connections to the Study Area

Autumn Woods Drive, Butternut Drive, Acorn Road, and Ironwood Boulevard are local roadways that comprise of the internal network of the existing Autumn Woods development. The roadways are part of the public street network and are assumed to have a speed limit of 25 MPH. At the time of the traffic study, speed limit signs were no observed within the development.

The intersection of Butternut Drive and Ironwood Boulevard (Intersection 3) is an uncontrolled t-intersection. Currently, the northern leg of Ironwood Boulevard is stubbed for future connection and does not have a home fronting the roadway. The intersection has a disconnected sidewalk along the south of Butternut Drive and along the west of Ironwood Boulevard. The intersection has an unstriped pedestrian crossing along the northbound approach. Within the northwest of the intersection there is a community park.

The intersection of Ironwood Boulevard and Autumn Woods Drive (Intersection 4) forms a stop-controlled t-intersection, with a stop sign on Ironwood Boulevard. Disconnected sidewalk runs parallel along the north of Ironwood Boulevard. The sidewalk ends at the intersection and has a constructed pedestrian ramp and warning tiles without a receiving sidewalk connection on the west of the road.

The intersection of Acorn Road and Autumn Woods Drive (Intersection 5) forms an all-way stop-controlled t-intersection. The intersection features an unmarked pedestrian crossing along the northwest-bound approach. Disconnected sidewalk runs parallel along the east of Acorn Road and a community park is located south of the intersection.

Existing Traffic Volumes and Analysis Assumptions

Traffic count data was collected by ISG at Intersections 1, 2, 3, 4 and 5 on Tuesday May 25th, 2021 from 6:00 AM – 10:00 AM and 2:30 PM – 6:30 PM. Area schools were in session with distant learning occurring on Wednesday. Outside temperatures ranged from 63 to 84-degrees Fahrenheit during the time of the study. Light precipitation occurred during the 15-minute period of 6:15 AM to 6:30 AM. All sidewalks, trails, and roadways had high visibility and no impediments. Travel speeds and vehicle movements were not impacted by external factors. The morning (AM) peak hour traffic from 7:30 AM to 8:30 AM and the evening (PM) occurred from 3:30 PM to 4:30 PM. Summary diagrams of the peak hour traffic counts are provided in **Appendix E**.

Traffic volumes were not collected at Intersections 6, 7, and 8. Intersections 6 and 7 will be constructed based on the proposed development scenario. Intersection 8 northbound approach 48-hour total volumes were collected by the City of Chaska using pneumatic tubes. Using the PM peak hour volume collected at Intersection 5 and the City's 48-hr approach volume, a K factor was determined using the following equation:

$$K = \frac{DHV}{AADT}$$

K is the factor of the proportion of the annual average daily traffic (AADT) in an hour. Using the recorded MnDOT AADT from the Traffic Mapping Application and the northbound approach volume along Acorn Road, a K value was established. The turning movements were assigned using the TURNS5 Turing Movement Analysis Tool. A copy of the work completed can be found in **Appendix F**.

The number of trips the proposed residential development will generate was estimated using the ITE Trip Generation Manual 10th Edition. A summary of the proposed traffic generated can be found below in **Table 1**.

Proposed Development																
ITE Code	210 Single Family Detached Housing	87 Dwelling Units														
	Average Rate / Fitted Curve Equation	# of Generated Trips	% Entering	% Exiting	# of Generated Trips Entering	# of Generated Trips Exiting	% Pass-by Trips	% Diverted Trips	% New Trips	# of Pass-by Trips Entering	# of Pass-by Trips Exiting	# of Diverted Trips Entering	# of Diverted Trips Exiting	# of New Trips Entering	# of New Trips Exiting	# of Studies
Weekday, PM Peak Hour Generator	$\ln(T) = 0.94 \ln(X) + 0.34$	93	64%	36%	59	34	0%	0%	100%	0	0	0	0	59	34	165
Weekday, AM Peak Hour Generator	$\ln(T) = 0.91 \ln(X) + 0.20$	71	26%	74%	18	53	0%	0%	100%	0	0	0	0	18	53	157
Weekday	$\ln(T) = 0.92 \ln(X) + 2.71$	915	50%	50%	457	458	0%	0%	100%	0	0	0	0	457	458	159

Note: Sums may not add as expected due to rounding. Utilized Trip Generation Manual, 10th Edition.

Table 1 ITE Trip Generation for the Proposed Development.

The PM peak hour generates the largest volume of traffic based on the existing collected traffic volumes and the proposed trip generation; the report will limit all comparisons for this study during the PM peak hour. Shown within **Figure 2** is a summary of the total volumes collected within 15-minute intervals across all five intersections.

EXISTING 2021

INTERSECTION 1	PM PEAK												
	2021 EXISTING												
Autumn Woods Dr. & Audubon Rd. (CSAH 15)	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		7		3				4	355			705	8
Queue (ft)		24						0				0	
Mvmt Delay (sec)		20.7		20.7				10.6	0.0			0.0	0.0
Mvmt LOS		C		C				B	A			A	A
Delay (sec)	0.2	20.7						0.1			0.0		
LOS	A	C						A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

Table 2 Intersection 1 Existing (2021) LOS and delay.

INTERSECTION 2	PM PEAK												
	2021 EXISTING												
Butternut Dr. / Bluff Creek Blvd. & Audubon Rd. (CSAH 15)	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		4	0	6	45	0	143	12	208	45	231	514	8
Queue (ft)		0	18	0	33	0	79	20	63	30	63	103	10
Mvmt Delay (sec)		9.3			18.7		1.3	4.6	4.8	1.6	7.2	7.2	0.6
Mvmt LOS		A			B		A	A	A	A	A	A	A
Delay (sec)	6.2	9.3			5.6			4.2			7.1		
LOS	A	A			A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

Table 3 Intersection 2 Existing (2021) LOS and delay.

INTERSECTION 3	PM PEAK												
	2021 EXISTING												
	Overall	Eastbound			Westbound			Northbound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Butternut Dr. & Ironwood Blvd.													
Volume (veh)					18		0		1	17	0	0	
Queue (ft)					0			0			0		
Mvmt Delay (sec)					0		0.0		0.0	0.0	0.0	0.0	
Mvmt LOS					A		A		A	A	A	A	
Delay (sec)	0.0				0.0			0.0			0.0		
LOS	A				A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

Table 4 Intersection 3 Existing (2021) LOS and delay.

INTERSECTION 4	PM PEAK												
	2021 EXISTING												
Ironwood Blvd. & Autumn Woods Dr.	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)					11		3		13	15	3	17	
Queue (ft)					42			0			0		
Mvmt Delay (sec)					9.1		9.1		0.0	0.0	8.3	0.0	
Mvmt LOS					A		A		A	A	A	A	
Delay (sec)	2.5				9.1			0.0			1.2		
LOS	A				A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

Table 5 Intersection 4 Existing (2021) LOS and delay.

INTERSECTION 5	PM PEAK												
	2021 EXISTING												
Autumn Woods Dr. & Acorn Rd.	Overall	SE Bound			NW Bound			NE Bound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)			4	26	6	6		23		17			
Queue (ft)		40			32			46					
Mvmt Delay (sec)		6.6			7.2			7.1					
Mvmt LOS		A			A			A					
Delay (sec)	6.9	6.6			7.2			7.1					
LOS	A	A			A			A					

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

Table 6 Intersection 5 Existing (2021) LOS and delay.

INTERSECTION 8	PM PEAK												
	2021 EXISTING												
Pioneer Trail (Co. Rd. 14) & Acorn Rd.	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		14	344	15	21	264	20	7	1	13	19	1	11
Queue (ft)		28	214	30	33	139	16	29		24	35		
Mvmt Delay (sec)		12.9	18.5	0.4	13.7	16.8	1.6	10.6		0.1	8.5		
Mvmt LOS		B	B	A	B	B	A	B		A	A		
Delay (sec)	16.0	17.6			15.6			4.2			8.5		
LOS	B	B			B			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

Table 7 Intersection 8 Existing (2021) LOS and delay.

Using Synchro version 11, multiple delay computation methods are available, including the Percentile Delay Method, the Highway Capacity Manual 6th Edition methodology, Highway Capacity Manual 2010 Edition methodology, and Highway Capacity Manual 2000 Edition methodology. Synchro's core delay calculation, the Percentile Delay Method, which is recommended by Synchro when evaluating actuated signals, produced delay results much closer to SimTraffic microsimulation model results than other delay computation methods. During field observations of queuing of the intersections, queues did not cause blocking or impede

traffic flow at any intersections. Observed queue lengths were reported to be closer to the 95th percentile queue lengths provided by SimTraffic and printed in the analysis worksheets in the Appendices.

LEVEL OF SERVICE AND DELAY

For this report the Level of Service (LOS) will be analyzed. For signalized intersection, the LOS is defined in terms of the average total vehicle delay of all movements through an intersection. Vehicle delay is a method of quantifying several intangible factors, including driver discomfort, frustration, and lost travel time. Specifically, LOS criteria is stated in terms of average delay per vehicle during specified time period (PM peak hour). Vehicle delay is a complex measure based on variables including signal phasing, signal cycle length, and traffic volumes with respect to intersection capacity. **Figure 3** shows the LOS table for signalized intersections.

Table 1. Level of Service Criteria for Signalized Intersections		
Level of Service	Average Control Delay (sec/veh)	General Description (Signalized Intersections)
A	≤10	Free Flow
B	>10 - 20	Stable Flow (slight delays)
C	>20 - 35	Stable flow (acceptable delays)
D	>35 - 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	>55 - 80	Unstable flow (intolerable delay)
F	>80	Forced flow (jammed)

Figure 3 Highway Capacity Manual (HCM), 2016 Signalized Intersection LOS.

For unsignalized intersections LOS criteria can be further reduced into two intersection types: all-way-stop-controlled and two-way-stop-controlled. All-way, stop-controlled intersection LOS is expressed in terms of the average vehicle delay of all of the movements, much like that of a signalized intersection. Two-way, stop-controlled intersection LOS is defined in terms of the average vehicle delay of an individual movement(s). This is because the performance of a two-way, stop-controlled intersection is more closely reflected in terms of its individual movements, rather than its terms of its individual movements. **Figure 4** shows the LOS table for unsignalized intersections.

Table 2. Level of Service Criteria for Unsignalized Intersections	
Level of Service	Average Control Delay (sec/veh)
A	0 - 10
B	>10 - 15
C	>15 - 25
D	>25 - 35
E	>35 - 50
F	>50

Figure 4 Highway Capacity Manual (HCM), 2016 Unsignalized Intersection LOS.

The existing study area is operating at a high LOS per each intersection with the lowest LOS rating of B at Intersection 8.

The lowest performing approach across the study is the eastbound approach at Intersection 1. Due to the higher volume on Audubon Road (CSAH 15) there are fewer gaps for vehicles to turn left and right from Autumn Woods Drive. Delay's experienced are approximately 20.7 seconds and resulting in a LOS C for the approach. The overall intersection is operating at a LOS A. Based

ROADWAY HISTORICAL GROWTH RATE

$$F = C(1 + i)^n$$

where: C = the current AADT
 F = the future AADT
 i = percent growth in decimal form
 n = number of years between C and F

Historical Traffic

The chart displays the Average Annual Daily Traffic (veh/day) from 2005 to 2019 for two locations: Audubon and Pioneer Trail. The y-axis ranges from 0 to 20,000 veh/day, and the x-axis ranges from 2005 to 2021.

Data Series:

- AADT on Audubon:** Represented by grey dots and a dotted trend line.
- AADT Pioneer Trail:** Represented by orange dots and a dotted trend line.

Regression Equations:

- AADT on Audubon:** $y = 60.69x^2 - 244,572.55x + 246,391,306.56$ with $R^2 = 0.70$.
- AADT Pioneer Trail:** $y = 44.15x^2 - 177,931.31x + 179,294,573.06$ with $R^2 = 0.62$.

Year	AADT on Audubon (veh/day)	AADT Pioneer Trail (veh/day)
2005	11,000	14,000
2007	11,500	13,500
2009	6,500	13,500
2011	6,500	8,000
2012	7,000	8,500
2014	7,500	9,000
2017	7,000	10,000
2019	6,500	10,000

Figure 5 Historical AADT volumes along the county roadways.

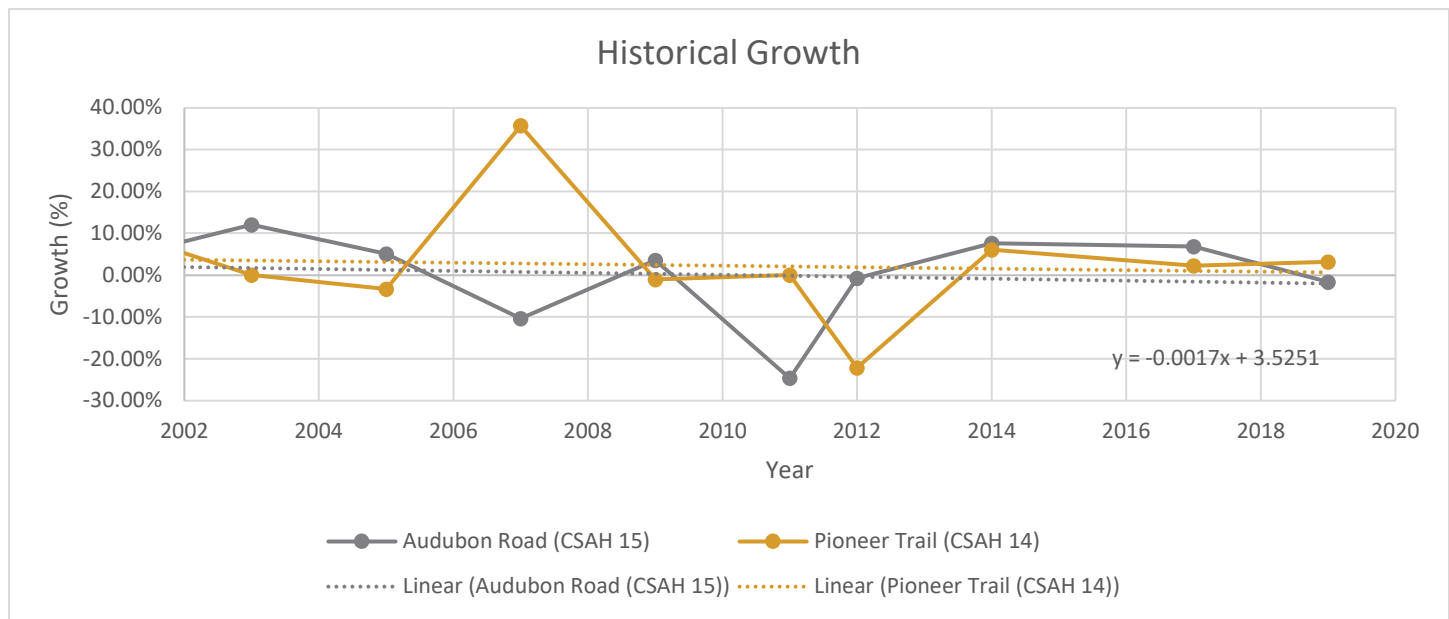


Figure 6 Historical growth along county roadways.

The future AADT was forecasted using the historical volumes from 2012 to 2019 due to the change in traffic volume after the construction and is illustrated in **Figures 7 and 8**. This resulted in a -1.3% annualized growth along Audubon Road (CSAH 15) and +3.0% annualized growth along Pioneer Trail (CSAH 14).

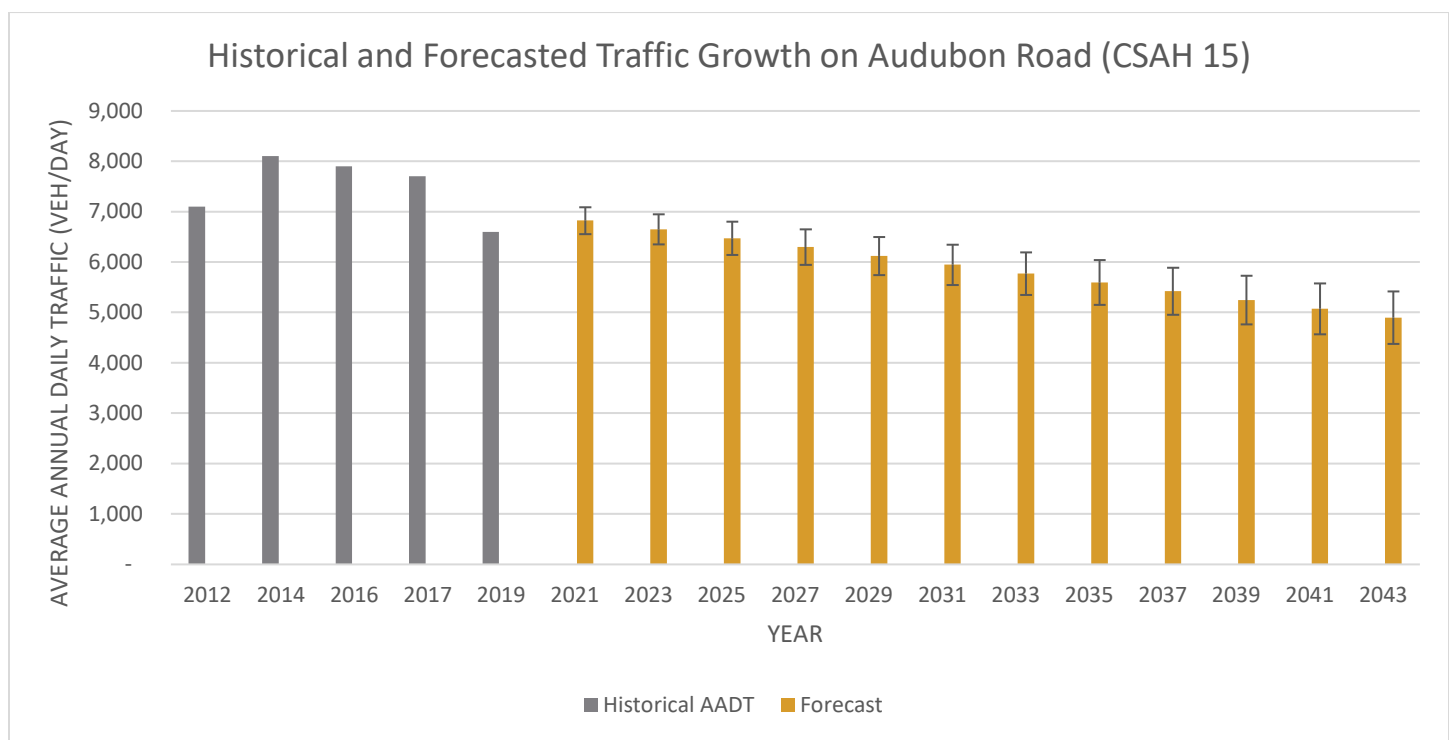


Figure 7 Historical and forecasted traffic growth along Audubon Road (CSAH 15).

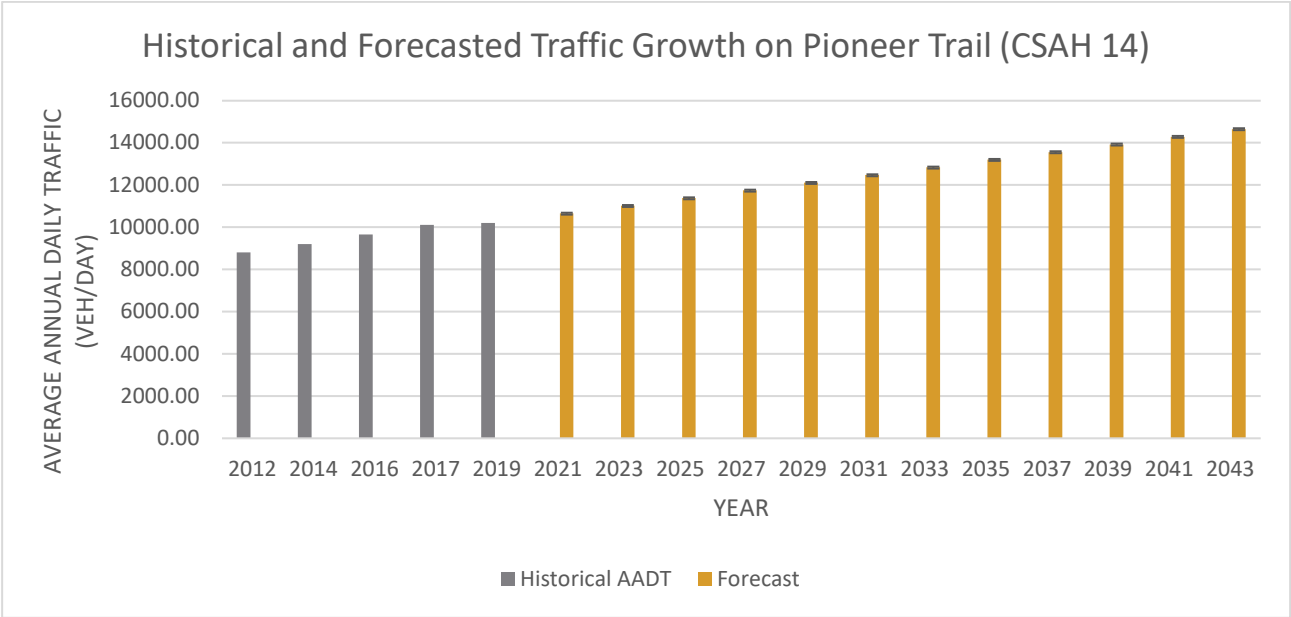


Figure 8 Historical and forecasted traffic growth along Dakota Avenue S.

In addition to looking at MnDOT historical AADT's, the Comprehensive Plans for the City of Chaska and Carver County were evaluated. Both the City and County listed a projected growth within the County, City, and general community.

The City evaluated traffic forecasting across the entire City. The City was broken out into demographics or Traffic Analysis Zones (TAZ). TAZ 290 is the existing development of Autumn Woods Drive. Within **Tables 8** and **9** are the projected populations recorded for TAZ 290 and the City of Chaska. **Tables 10** and **11** reflect similar data of City and County growth that was projected from 2018 Met Council data.

Year	TAZ 290 Population	Annualized Growth %
2014	382.00	
2020	408.00	1.10%
2030	491.00	1.87%
2040	569.00	1.49%
	AVERAGE	1.49%

Table 8 Projected Population Growth within Traffic Analysis Zone (TAZ) 290 from the City of Chaska 2040 Comprehensive Plan.

Year	Overall City Population	Growth % by Year
2014	25,337.00	
2020	27,100.00	1.13%
2030	32,000.00	1.68%
2040	36,600.00	1.35%
	AVERAGE	1.39%

Table 9 Projected Population Growth within the City from the City of Chaska 2040 Comprehensive Plan.

Year	Overall County Population	Annualized Growth %
2010	91,000.00	
2016	100,621.00	1.69%

Table 10 Projected Population Growth within the County from the Carver County 2040 Comprehensive Plan. Data Source: Met Council, 2018.

Year	Overall City Population	Annualized Growth %
2010	23,770.00	
2016	26,439.00	1.79%

Table 11 Projected Population Growth within the City from the Carver County 2040 Comprehensive Plan. Data Source: Met Council, 2018.

For this study, the future traffic along Audubon Road (CSAH 15) and Pioneer Trail (CSAH 14) have the applied growth rates of +1.5% and +3.0% to the background traffic for Opening (2023), No Build (2023 and 2043), Full Build (2043) , and Scenarios 1, 2, and 3. The +1.5% growth is also applied throughout the existing neighborhood traffic conservatively.

PEAK HOURLY FACTOR

For the area roadway system of this report, the Peak Hourly Factor (PHF) was determined by evaluating the collected traffic counts by comparing the volume during the busiest 15-minutes of the peak hour with the total volume during the peak hour. A minimum PHF of 0.75 was used if the calculated value was lower than 0.75. The PHF was applied to each intersection within Synchro 11 for all existing and future scenarios.

PROPOSED CONDITIONS

Existing traffic was projected to create a 2-year (2023) Opening scenario and a 20-year (2043) Full Build traffic for the 3:30 PM to 4:30 PM weekday peak hour. The method for determining these traffic projections included trip generation and distribution analyses based on estimates from the ITE Trip Generation Manual 10th Edition and existing traffic data. Additionally, three access scenarios were evaluated to analyze the queuing and LOS of the study area with the local roadway connections onto Autumn Woods Drive (Access A) (Intersection 6), the existing stub of Ironwood Boulevard (Intersection 3), and a right-out connection (Access B) onto Audubon Road (CSAH 15) (Intersection 7).

Site Traffic

TRIP GENERATION

The Reserve at Autumn Woods, a proposed 87-unit development, is anticipated to start construction in fall 2022. It is expected that by 2023 the development will be completed and operating at full capacity, conservatively. The additional traffic created as a result of the proposed development will be composed of new trips generally created by the new residents and visitors they attract. For this study, a trip is defined as a one-way movement between an origin and a destination. The expected number of trips the proposed development will generate was estimated using the ITE Trip Generation Manual 10th Edition.

	# of Generated Trips	# of Generated Trips Entering	# of Generated Trips Exiting
Weekday, PM Peak Hour Generator	93	59	34

Table 8 PM Peak Hour Trip Generation of the Proposed Residential Development.

SITE ACCESS

Proposed site access is being evaluated across three scenarios and following Carver County access guidelines. Access guidelines define a starting point for balancing property access, safety, and mobility concerns. Access guidelines can be used to improve communication, enhance safety, and maintain the capacity and mobility of transportation corridors. In addition, access guidelines may be used to respond to access requests and promote good access practices such as:

- Aligning access with other existing access points.
- Providing adequate spacing to separate and reduce conflicts.
- Encouraging indirect access over direct access on high-speed, high-volume arterial routes.

The proposed accesses for this development meet minimum county access spacing guidelines and each scenario provides a minimum of one full access onto a local road.

Scenario 1

Scenario 1 proposes that traffic would enter and exit the development through two established accesses on the north and east of the property. A full access constructed at the north of the development, connecting to Autumn Woods Drive (Intersection 6) and right-out only access (Intersection 7) providing direct access to Audubon Road (CSAH 15). This scenario would not utilize the extension of Ironwood Boulevard (Intersection 3), on the southern property border, that appeared to be extended for the future development during the construction of the existing residential development.

Scenario 2

Traffic would enter and exit the development through three established accesses on the north (Intersection 6), east (Intersection 7), and south (Intersection 3) of the property. The scenario would mimic Scenario 1 and would connect to the existing stub of Ironwood Boulevard (Intersection 3).

Scenario 3

Traffic would enter and exit the development through two full access point at Autumn Woods Drive (Intersection 6) and Ironwood Boulevard (Intersection 3). The right-out onto Audubon Road (CSAH 15) (Intersection 7) would not be constructed.

TRIP DISTRIBUTION AND ASSIGNMENT

It is assumed that the Reserve at Autumn Woods new trips would follow similar traffic patterns within the study area. Based on distance and Existing (2021) Level of Service (LOS) ratings, it is anticipated that internal traffic on the local roadways will continue to access the minor arterial roadways via the quickest route rather than taking an extended route through the connecting local roadway system to avoid signals.

Scenario 1

For Scenario 1, Intersection 6 (Access A and Autumn Woods Drive) would serve as the primary entry and exit point for the proposed development. Intersection 7 (Access B and Audubon Road (CSAH 15)), a right-out only, will limit vehicle traffic to only enter the proposed development through Intersection 6. It is anticipated that a portion of traffic will utilize alternative routes throughout the existing development of Autumn Woods Drive to enter in the proposed development.

Scenario 2

For Scenario 2, Intersection 6 and Intersection 3 (Ironwood Boulevard and Butternut Drive) will serve as the primary accesses and Intersection 7 will serve as a secondary access. The traffic pattern for Scenario 2 is similar to Scenario 1 with volumes redistributed to enter and exit the development through Intersection 3. The access at Intersection 3 is anticipated to eliminate the alternative route traffic from Scenario 1.

Scenario 3

Scenario 3 removes Intersection 7 and redistributes traffic between Intersection 3 and 6. Scenario 3 will provide two full accesses to service the proposed development.

The conservative assumption was provided in all models to represent the worst-case scenario. Upon further discussion with County Staff, it was determined that a Sensitivity Analysis would be completed to determine what the 20-year (Full Build) trip distribution would likely redistribute as background traffic increases. The following section of this report discusses the work completed in the Sensitivity Analysis and documents the findings. The diagrams of the Trip Distributions for the proposed traffic during the PM period are provided in **Appendix H**. Trips assigned to the intersection within Synchro can be seen in the analysis reports as “Future Vol”. These trips are included in the LOS analyses.

SENSITIVITY ANALYSIS

On July 30th, 2021 Carver County Requested ISG completes a Sensitivity Analysis was completed to understand 20-year projected (Full Build) Trip Distribution and Assignments. The completed Sensitivity Analysis analyzed the following distributions in comparison:

Scenario	Intersection 4 - Percent (%) of Assigned Traffic	Intersection 6 - Percent (%) of Assigned Traffic	Intersection 7 - Percent (%) of Assigned Traffic
1(a)	0	75	25
1(b)	0	50	50
1(c)	0	75	25
1(d)	0	100	0
3(a)	25	75	0
3(b)	50	50	0
3(c)	75	25	0

Table 9 Trip Assignments evaluated within the performed Sensitivity Analysis.

Findings

Each Scenario was modeled using Synchro and SimTraffic version 11 and compared the delay and LOS impacts on all eight (8) Intersections in the study area. The following items were concluded:

- It was determined that 1(b) and 1(c) are infeasible options. Due to a majority of traffic traveling north along Audubon Road (CSAH 15), it would require a large percentage of vehicles to exit the development from Intersection 7 (Access B & Audubon Road (CSAH15)) heading southbound and make a U-turn at Intersection 3 (Butternut Drive & Ironwood Boulevard) or make a right-turn and travel through the existing development along Autumn Woods Drive to head northbound on Audubon Road (CSAH 15).
- Intersections 3, 4, 5, 6, and 8 had similar delays and LOS across the Analysis. The intersections were not evaluated further as the modification to trip distribution did not directly impact the intersection operations.
- Intersection 1 (Autumn Woods Drive & Audubon Road (CSAH 15)):
 - In 2043, all splits for both scenarios (1 & 3) will experience a LOS E for the Eastbound leg. Overall, the intersection will operate at a high LOS (A) with a low over delay.
 - Scenario 3, 25-75 split experiences the lowest delay of 39.8 seconds for the eastbound leg. In comparison the delay for the eastbound leg at the 2043 No Build is 32.9 seconds. The delay experienced would increase by 6.9 seconds.

- Intersection 2 (Butternut Drive / Bluff Creek Boulevard & Audubon Road (CSAH 15)):
 - In 2043, the overall Intersection will experience a delay of 7.1 – 8.7 seconds and operate at a LOS A regardless of the scenario or split.
 - The trip distributions (25-75, 50-50, 25-75) do not impact an individual leg by more than 1 second for Scenario 1 or Scenario 3.
 - It is anticipated that delays at the intersection will increase for Scenario 3, as more traffic would be directed to the intersection.
 - For the 2043 No Build, the intersection experiences similar delays to Scenario 1 as expected. Scenario 3 will increase the overall delay by 1 second approximately.

Intersection 7 (Audubon Road (CSAH 15) & Access B):

- The intersection only occurs for Scenario 1 in the sensitivity study.
- Delays increase on the eastbound leg as more traffic is directed through Access B (18-18.9 seconds).

It was concluded that for Scenario 3 Full Build (2043) the Trip Distribution would be modeled and evaluated as a 25-75 percent split. Additional information on the work performed and Synchro Reports can be provided upon request.

Based on the Existing 2021 analysis, it was noted that the eastbound approach has a C LOS. A multi-way stop and signal warrant analysis was performed to determine if a signal is justified as an alternative intersection control. Per Carver County's access management guidelines, signals on a minor arterial roadway within urban / urbanizing areas shall be spaced every quarter of a mile. The spacing between Intersection 1 and Intersection 2 is approximately 0.3 miles and would meet County spacing requirements. In accordance with the 2018 Minnesota Manual on Uniform Traffic Control Devices (MnMUTCD), a warrant analysis was performed for a multi-way stop application and for a traffic signal control at the intersection.

WARRANT	WARRANT SATISFIED?	DESCRIPTION
WARRANT 1	NOT MET	Minor roadway volume not met.
WARRANT 2 - FOUR HOUR VOLUMES	NOT MET	Minor roadway volume not met.
WARRANT 3 - PEAK HOUR	NOT MET	Minor roadway volume not met.
WARRANT 4 - PEDESTRIAN VOLUME	NOT MET	Total of all pedestrian crossing on major street not met.
WARRANT 5 - SCHOOL CROSSING	NOT MET – N/A	Intersection is not a designed school crossing.
WARRANT 6 - COORDINATED SIGNAL SYSTEM	NOT MET – N/A	Adjacent traffic signal is not within distance parameters.
WARRANT 7 - CRASH EXPERIENCE	NOT MET – N/A	There are no historical crash's reported within the last 10 years at the intersection.
WARRANT 8 - ROADWAY NETWORK	NOT MET	Intersection does not meet roadway network criteria.
WARRANT 9 – INTERSECTION NEAR A GRADE CROSSING	NOT MET - NA	The intersection is not within proximity to an at grade crossing.

Due to the low traffic volume along the minor roadway (Autumn Woods Drive) and low pedestrian volumes, a signal or multi-way stop is not warranted at Intersection 1. A series of plots are shown within **Figures 9** and **10** to illustrate where the intersection volumes plot for different warrant criteria. The multi-way stop warrant was performed and determined to not be warranted based on Criteria B, C.1, and C.2 per MnMUTCD. Based on the information presented, Intersection 1 will not be modeled with a signal as the intersection control, as it is not warranted. Additional improvements to the intersection are listed within the **Recommendations** section of the report.

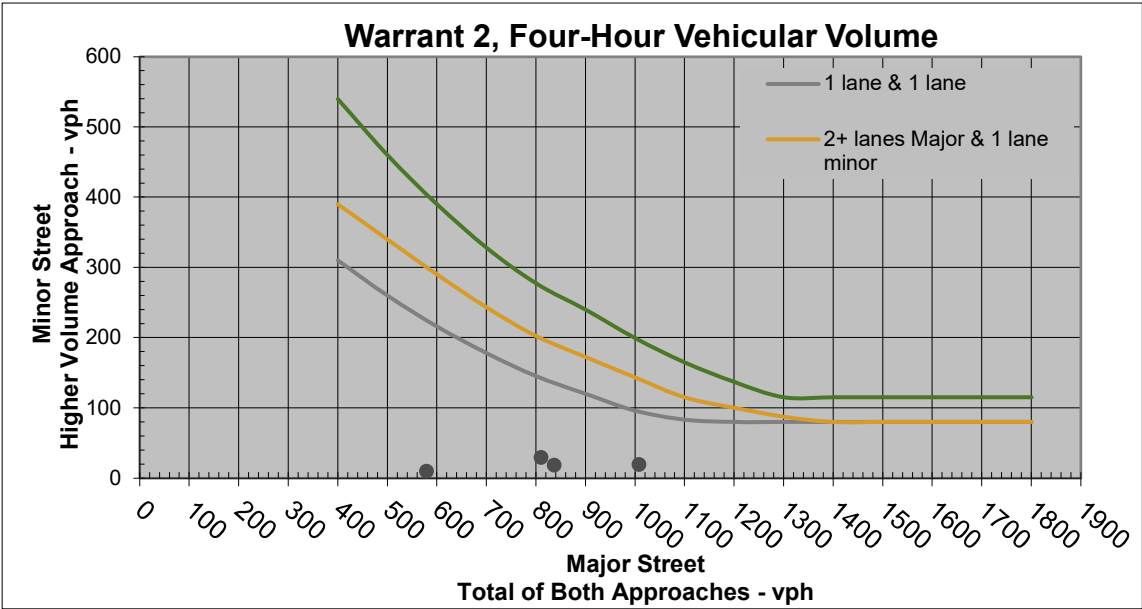


Figure 9 Warrant 2, four hour volume plot for Intersection 1.

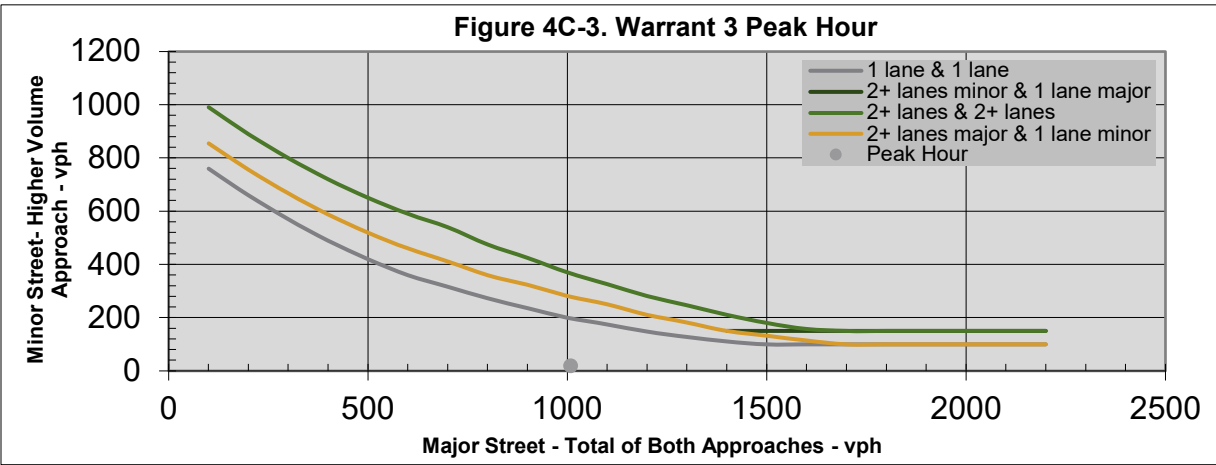


Figure 10 Warrant 3, peak hour for Intersection 1.

Other Traffic

MODAL SPLIT

Cyclists and pedestrian traffic were entered in Intersections 1, 2, 3, 4 and 5 during the PM Peak Hour from what was observed during the traffic counts. Along roadways where no sidewalk or trail was provided, cyclists and pedestrians were noted utilizing the roadway.

Bituminous trails or sidewalk connections are provided throughout the study area. A map showing the existing sidewalk and shared use trails are within in **Appendix J**. As the residential development is constructed, making connections to the City's sidewalk and trails should continue where feasible. Currently the proposed development is planning on constructing sidewalk on both sides of the roadway and a shared use paths throughout the development to connect existing walkways and paths and to existing and proposed parks.

Coordination with the local school district (ISD 112) identified that there are two bus routes throughout the development for middle schools and elementary school. Both routes utilize the large bus in comparison to the special education route that utilizes a smaller bus vehicle. The special education route does not have a "typical" route as it depends on the student's time of pick-up, which may fluctuate. In addition, the special education route does not have a localized pick-up and drop-off locations, the students are picked-up and dropped-off to each student's home.

The two large bus routes are broken out by school, with one route servicing elementary level students at Jonathon Elementary and the second servicing middle school level students who attend Chaska Middle School East and Chaska Middle School West. There are no bus routes for High School level students within the development at the time of the study. For the two routes, pick-up and drop-off time is between 8:10 AM – 8:40 AM and 3:30 PM – 4:00 PM. The school buses currently have a total of 9 stops, 4 for one route and 5 for the other, within the existing residential development. A map of the current bus routes has been provided within **Appendix K**. As observed during the traffic study, a majority of the students are dropped off or picked up by an adult or take a sidewalk path home. As the proposed residential development continues to grow, it is likely that more stops will be added along the current routes.

Streets that do not have pedestrian walkways are recommended to construct pedestrian facilities to provide a refuge for pedestrian traffic. This would not only benefit students walking home but improve safety for pedestrian walking throughout the neighborhood to localized facilities (cluster mailboxes, trails or localized parks) or out for walk.

Total Future Traffic

The trip generation, trip distribution, and traffic assignment analysis and calculations result in peak hour volume for each study period. **Appendix L** shows the 2023 Opening PM peak volumes for Scenario 1, 2 and 3, **Appendix M** shows the corresponding Synchro analysis worksheets for all scenarios. Refer to **Appendix N** for the 2023 No Build, **Appendix O** for the 2023 No Build Synchro analysis worksheets. **Appendix P** shows the 2043 Full Build for Scenario 1, 2, and 3 turning movement diagram. **Appendix Q** shows the corresponding Synchro analysis worksheets for all scenarios. Refer to **Appendices R** and **S** for the 2043 No Build diagram and Synchro analysis worksheets.

TRAFFIC ANALYSIS

Capacity and Level of Service at Studied Intersections

The PM peak hour volumes for each study period were analyzed within Synchro (Percentile and HCM 6th Edition delay methods) for capacity and LOS at the study roadways and intersections. **Tables 8-15** show the 2023 Opening condition LOS and delay, **Tables 16-21** show the 2023 No Build condition LOS and delay, **Tables 22-29** show the 2043 Full Build condition LOS and delay, and **Tables 30-35** show the 2043 No Build condition LOS and delay. For each scenario, the signal at Intersection 2 and 8 were optimized for splits.

2023 OPENING CONDITION

INTERSECTION 1	PM PEAK - SCENARIO 1												
	2023 OPENING												
	Overall	Eastbound			Westbound			Northbound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Autumn Woods Dr. & Audubon Rd. (CSAH 15)													
Volume (veh)		29		4				22	366			727	46
Queue (ft)		84		23				90	0		0		
Mvmt Delay (sec)		49.6		16.8				11.5	0.0			0.0	
Mvmt LOS		E		C				B	A			A	A
Delay (sec)	1.0	27.7						0.6			0.0		
LOS	A	D						A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 1	PM PEAK - SCENARIO 2												
	2023 OPENING												
	Overall	Eastbound			Westbound			Northbound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Autumn Woods Dr. & Audubon Rd. (CSAH 15)													
Volume (veh)		27		3				4	368			727	46
Queue (ft)		28		0				35	0		0		
Mvmt Delay (sec)		27		14.2				10.1	0.0			0.0	
Mvmt LOS		E						B	A			A	A
Delay (sec)	0.7	25.7						0.1			0.0		
LOS	A	D						A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 1	PM PEAK - SCENARIO 3												
	2023 OPENING												
Autumn Woods Dr. & Audubon Rd. (CSAH 15)	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		27		4				4	368			727	46
Queue (ft)		68						22			0		
Mvmt Delay (sec)		27		14.3				10.1	0.0			0.0	
Mvmt LOS		D		B				B	A			A	A
Delay (sec)	0.7	25.4						0.1			0.0		
LOS	A	D						A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

Table 11 Intersection 1 Opening (2023) LOS and delay for Scenarios , 2, and 3.

INTERSECTION 2	PM PEAK - SCENARIO 1												
	2023 OPENING												
	Overall	Eastbound			Westbound			Northbound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Butternut Dr. / Bluff Creek Blvd. & Audubon Rd. (CSAH 15)													
Volume (veh)		4	0	6	45	0	153	12	226	46	241	537	8
Queue (ft)		0			59	0	65	18	95	23	69	103	0
Mvmt Delay (sec)		0.6			24.6	0	1.4	4	10.3	1.6	7.4	10.8	0
Mvmt LOS		A			C	A	A	A	B	A	A	B	A
Delay (sec)	6.8	0.2			6.0			7.4			6.9		
LOS	A	A			A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 2	PM PEAK - SCENARIO 2												
	2023 OPENING												
	Overall	Eastbound			Westbound			Northbound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Butternut Dr. / Bluff Creek Blvd. & Audubon Rd. (CSAH 15)													
Volume (veh)		6	1	8	45	6	147	24	214	46	240	534	8
Queue (ft)		22			53	0	73	37	88	34	96	143	12
Mvmt Delay (sec)		14.9			23.4	19.2	8.6	3.7	8.9	0.7	5.2	7.6	0
Mvmt LOS		B			C	B	A	A	B	A	A	A	A
Delay (sec)	7.8	14.9			12.3			7.1			6.8		
LOS	A	B			B			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 2	PM PEAK - SCENARIO 3														
	2023 OPENING														
	Overall	Eastbound			Westbound			Northbound			Southbound				
L		T	R	L	T	R	L	T	R	L	T	R			
Butternut Dr. / Bluff Creek Blvd. & Audubon Rd. (CSAH 15)		6	3	11	45	6	147	24	214	46	238	530	8		
Volume (veh)		6			3	11	45	6	147	24	214	46	238	530	8
Queue (ft)		25			64	18	60	39	86	31	76	112	16		
Mvmt Delay (sec)		13.2			24.8	18.8	8.5	4.5	10.2	1.6	7.2	12.8	0		
Mvmt LOS		B			C	B	A	A	B	A	A	B	A		
Delay (sec)	10.5	13.3			12.6			8.0			10.9				
LOS	B	B			B			A			B				

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

Table 12 Intersection 2 Opening (2023) LOS and delay for Scenarios , 2, and 3.

INTERSECTION 3	PM PEAK - SCENARIO 1												
	2023 OPENING												
Butternut Dr. & Ironwood Blvd.	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)					18		0		1	17	0	0	
Queue (ft)					0			0			0		
Mvmt Delay (sec)					0.0			0.0			0.0		
Mvmt LOS					A	A	A	A	A	A	A	A	A
Delay (sec)	0.0				0.0			0.0			0.0		
LOS	A				A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 3	PM PEAK - SCENARIO 2												
	2023 OPENING												
Butternut Dr. & Ironwood Blvd.	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)					18		18		4	17	5	1	
Queue (ft)					0			0			0		
Mvmt Delay (sec)					0.0			0.0			0.0		
Mvmt LOS					A	A	A	A	A	A	A	A	A
Delay (sec)	0.0				0.0			0.0			0.0		
LOS	A				A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 3	PM PEAK - SCENARIO 3												
	2023 OPENING												
	Overall	Eastbound			Westbound			Northbound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Butternut Dr. & Ironwood Blvd.													
Volume (veh)				18		18		4	17	10	1		
Queue (ft)					15			0			15		
Mvmt Delay (sec)					0.0			0.0			0.0		
Mvmt LOS					A	A	A	A	A	A	A	A	A
Delay (sec)	0.0				0.0			0.0			0.0		
LOS	A				A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

Table 13 Intersection 3 Opening (2023) LOS and delay for Scenarios , 2, and 3.

INTERSECTION 4	PM PEAK - SCENARIO 1												
	2023 OPENING												
	Overall	Eastbound			Westbound			Northbound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Ironwood Blvd. & Autumn Woods Dr.													
Volume (veh)					11		3		16	15	3	18	
Queue (ft)					30				0		0		
Mvmt Delay (sec)					9.1				0.0		8.3	0.0	
Mvmt LOS					A				A		A		
Delay (sec)	2.3				9.1			0.0			1.2		
LOS	A				A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 4	PM PEAK - SCENARIO 2												
	2023 OPENING												
	Overall	Eastbound			Westbound			Northbound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Ironwood Blvd. & Autumn Woods Dr.					12		3		13	18	3	17	
Volume (veh)					12		3		13	18	3	17	
Queue (ft)					35				0		0		
Mvmt Delay (sec)					9.0				0.0		8.3	0.0	
Mvmt LOS					A				A		A		
Delay (sec)	2.4				9.0			0.0			1.2		
LOS	A				A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 4	PM PEAK - SCENARIO 3												
	2023 OPENING												
	Overall	Eastbound			Westbound			Northbound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Ironwood Blvd. & Autumn Woods Dr.					12		3		13	18	3	17	
Volume (veh)													
Queue (ft)					46				0		0		
Mvmt Delay (sec)					9.1				0.0		8.3	0.0	
Mvmt LOS					A				A		A		
Delay (sec)	2.4				9.0			0.0			1.2		
LOS	A				A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

Table 14 Intersection 4 Opening (2023) LOS and delay for Scenarios , 2, and 3.

Intersection 5	PM Peak - Scenario 1												
	2023 Opening												
Autumn Woods Dr. & Acorn Rd.	Overall	SE Bound			NW Bound			NE Bound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)			4	36	7	6		26		7			
Queue (ft)		45			32			50					
Mvmt Delay (sec)		6.6			7.2			7.3					
Mvmt LOS		A			A			A					
Delay (sec)	7.0	6.6			7.2			7.3					
LOS	A	A			A			A					

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 5	PM PEAK - SCENARIO 2												
	2023 OPENING												
Autumn Woods Dr. & Acorn Rd.	Overall	SE Bound			NW Bound			NE Bound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)			4	36	7	6		26		7			
Queue (ft)		61			38			43					
Mvmt Delay (sec)		6.6			7.2			7.3					
Mvmt LOS		A			A			A					
Delay (sec)	7.0	6.6			7.2			7.3					
LOS	A	A			A			A					

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 5	PM PEAK - SCENARIO 3												
	2023 OPENING												
Autumn Woods Dr. & Acorn Rd.	Overall	SE Bound			NW Bound			NE Bound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)			4	36	7	6		26		7			
Queue (ft)		42			38			54					
Mvmt Delay (sec)		6.6			7.2			7.3					
Mvmt LOS		A			A			A					
Delay (sec)	7.0	6.6			7.2			7.3					
LOS	A	A			A			A					

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

Table 15 Intersection 5 Opening (2023) LOS and delay for Scenarios , 2, and 3.

INTERSECTION 6	PM PEAK - SCENARIO 1												
	2023 OPENING												
Autumn Woods Dr. & Access A	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		0	0	3	56	0	0	1	0	23	0	0	0
Queue (ft)		0			0			51			0		
Mvmt Delay (sec)		0			7.3			0			0		
Mvmt LOS		A			A			A			A		
Delay (sec)	4.9	0.0			7.3			0.0			0.0		
LOS	A	A			A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 6	PM PEAK - SCENARIO 2												
	2023 OPENING												
Autumn Woods Dr. & Access A	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		0	0	0	38	0	0	0	0	20	0	0	0
Queue (ft)		0			0			39			0		
Mvmt Delay (sec)		0			7.3	0	0	0			0		
Mvmt LOS		A			A			A			A		
Delay (sec)	4.7	0.0			7.3			0.0			0.0		
LOS	A	A			A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 6	PM PEAK - SCENARIO 3												
	2023 OPENING												
Autumn Woods Dr. & Access A	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		0	0	0	38	0	0	0	0	21	0	0	0
Queue (ft)		0			0			41			0		
Mvmt Delay (sec)		0			7.3	0	0	0			0		
Mvmt LOS		A			A			A			A		
Delay (sec)	4.6	0.0			7.3			0.0			0.0		
LOS	A	A			A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

Table 16 Intersection 6 Opening (2023) LOS and delay for Scenarios , 2, and 3.

INTERSECTION 7	PM PEAK - SCENARIO 1												
	2023 OPENING												
Audubon Road (CSAH 15) & Access B	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		0		10					232			728	
Queue (ft)		0						0			0		
Mvmt Delay (sec)		14.5						0			0		
Mvmt LOS		B						A			A		
Delay (sec)	0.1	14.5						0.0			0.0		
LOS	A	B						A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 7	PM PEAK - SCENARIO 2												
	2023 OPENING												
	Overall	Eastbound			Westbound			Northbound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Audubon Road (CSAH 15) & Access B													
Volume (veh)		0		7					216			727	
Queue (ft)		0						0			0		
Mvmt Delay (sec)		14.4						0			0		
Mvmt LOS		B						A			A		
Delay (sec)	0.1	14.4						0.0			0.0		
LOS	A	B						A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 7	PM PEAK - SCENARIO 3												
	2023 OPENING												
Audubon Road (CSAH 15) & Access B	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)													
Queue (ft)													
Mvmt Delay (sec)													
Mvmt LOS													
Delay (sec)													
LOS													

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

Table 17 Intersection 7 Opening (2023) LOS and delay for Scenarios , 2, and 3.

INTERSECTION 8	PM PEAK - SCENARIO 1												
	2023 OPENING												
Pioneer Trail (Co. Rd. 14) & Acorn Rd.	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		17	364	16	22	280	20	7	1	13	20	1	12
Queue (ft)		51	195	30	15	103	14	18		20	28		
Mvmt Delay (sec)		13.1	19.1	0.6	13.9	17.2	1.6	0	10.6	0.1	0	8.4	0
Mvmt LOS		B	B	A	B	B	A	B	B	A	A	A	A
Delay (sec)	16.4	18.1			16.0			4.2			8.4		
LOS	B	B			B			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 8	PM PEAK - SCENARIO 2												
	2023 OPENING												
	Overall	Eastbound			Westbound			Northbound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Pioneer Trail (Co. Rd. 14) & Acorn Rd.													
Volume (veh)		14	364	16	22	280	23	7	1	13	21	1	11
Queue (ft)		31	162	31	19	149	13	0		26	33		
Mvmt Delay (sec)		13	19.1	0.6	13.9	17.2	1.9	0	10.6	0.1	0	8.6	0
Mvmt LOS		B	B	A	B	B	A	A	B	A	A	A	A
Delay (sec)	16.4	18.1			15.9			4.2			8.6		
LOS	B	B			B			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 8	PM PEAK - SCENARIO 3												
	2023 OPENING												
Pioneer Trail (Co. Rd. 14) & Acorn Rd.	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		17	364	16	22	280	20	7	1	13	20	1	11
Queue (ft)		40	199	31	37	159	11	17		22	54		
Mvmt Delay (sec)		13.1	19.1	0.6	13.9	17.2	1.6	0	10.6	0.1	0	8.4	0
Mvmt LOS		B	B	A	B	B	A	A	B	A	A	A	A
Delay (sec)	16.4	18.1			16.0			4.2			8.4		
LOS	B	B			B			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

Table 18 Intersection 8 Opening (2023) LOS and delay for Scenarios , 2, and 3.

2023 NO BUILD CONDITION

INTERSECTION 1	PM PEAK												
	2023 NO BUILD												
Autumn Woods Dr. & Audubon Rd. (CSAH 15)	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		7		3				4	366			727	8
Queue (ft)		25						0	0			0.0	
Mvmt Delay (sec)		21..6						10	0			0.0	
Mvmt LOS		C						A	A			A	A
Delay (sec)	0.2	21.6						0.1			0.0		
LOS	A	C						A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).
 Table 19 Intersection 1 No Build (2023) LOS and delay.

INTERSECTION 2	PM PEAK												
	2023 NO BUILD												
Butternut Dr. / Bluff Creek Blvd. & Audubon Rd. (CSAH 15)	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		4	0	6	45	0	147	12	214	46	238	529	8
Queue (ft)		0			40	0	45	17	49	15	112	100	0
Mvmt Delay (sec)		5.5			18.1	0	0.8	4	4.4	1.7	6.1	6.2	0
Mvmt LOS		A			B	A	A	A	A	A	A	A	A
Delay (sec)	5.4	5.5			4.9			3.9			6.1		
LOS	A	A			A			A			B		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).
 Table 20 Intersection 2 No Build (2023) LOS and delay.

INTERSECTION 3	PM PEAK												
	2023 NO BUILD												
	Overall	Eastbound			Westbound			Northbound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Butternut Dr. & Ironwood Blvd.					18		0		1	17	0	0	
Volume (veh)													
Queue (ft)					0			0			0		
Mvmt Delay (sec)					0.0			0.0			0.0		
Mvmt LOS					A	A	A	A	A	A	A	A	A
Delay (sec)	0.0				0.0			0.0			0.0		
LOS	A				A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).
 Table 21 Intersection 3 No Build (2023) LOS and delay.

INTERSECTION 4	PM PEAK												
	2023 NO BUILD												
Ironwood Blvd. & Autumn Woods Dr.	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)					11		3		13	15	3	17	
Queue (ft)					34			0			0		
Mvmt Delay (sec)					9.0		0.0		0.0		8.2	0.0	
Mvmt LOS					A		A		A		A		
Delay (sec)	2.4				9.0			0.0			1.2		
LOS	A				A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).
 Table 22 Intersection 4 No Build (2023) LOS and delay.

INTERSECTION 5	PM PEAK												
	2023 NO BUILD												
Autumn Woods Dr. & Acorn Rd.	Overall	SE Bound			NW Bound			NE Bound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)			4	35	7	6		23		17			
Queue (ft)		48			43			31					
Mvmt Delay (sec)			6.6		7.2			7.1					
Mvmt LOS		A			A			A					
Delay (sec)	6.9	6.6			7.2			7.1					
LOS	A	A			A			A					

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).
Table 23 Intersection 5 No Build (2023) LOS and delay.

INTERSECTION 8	PM PEAK												
	2023 NO BUILD												
	Overall	Eastbound			Westbound			Northbound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Pioneer Trail (Co. Rd. 14) & Acorn Rd.													
Volume (veh)		14	364	16	22	280	20	7	1	13	20	1	11
Queue (ft)		40	108	29	30	201	10	26		30	40		
Mvmt Delay (sec)		13	19.1	0.6	13.9	17.2	1.6	10.6		0.1	8.5		
Mvmt LOS		B	B	A	B	B	A	B		A	A		
Delay (sec)	16.5	18.1			16.0			4.2			8.5		
LOS	B	B			B			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).
Table 24 Intersection 8 No Build (2023) LOS and delay.

2043 FULL BUILD CONDITION

INTERSECTION 1	PM PEAK - SCENARIO 1												
	2043 FULL BUILD												
Autumn Woods Dr. & Audubon Rd. (CSAH 15)	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		29		12				23	479			949	48
Queue (ft)		0		17				20				0	
Mvmt Delay (sec)		162.8		26.1				13.9	0.0			0.0	
Mvmt LOS		E						B	A			A	A
Delay (sec)	1.3	42.0						0.5			0.0		
LOS	A	E						A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 1	PM PEAK - SCENARIO 2												
	2043 FULL BUILD												
Autumn Woods Dr. & Audubon Rd. (CSAH 15)	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		29		4				5	481			949	48
Queue (ft)		35		17				21	0			0	
Mvmt Delay (sec)		46.6		17.6				11.4	0.0			0.0	
Mvmt LOS		E		C				B	A			A	A
Delay (sec)	1.0	43.1						0.1			0.0		
LOS	A	E						A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 1	PM PEAK - SCENARIO 3												
	2043 FULL BUILD												
Autumn Woods Dr. & Audubon Rd. (CSAH 15)	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		18		4				5	493			973	25
Queue (ft)		61		29				26	0			0	
Mvmt Delay (sec)		44.6		18.1				11.4	0.0			0.0	
Mvmt LOS		E		C				B	A			A	A
Delay (sec)	0.6	39.8						0.1			0.0		
LOS	A	E						A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

Table 25 Intersection 1 Full Build (2043) LOS and delay for Scenarios 1, 2, and 3.

INTERSECTION 2	PM PEAK - SCENARIO 1												
	2043 FULL BUILD												
Butternut Dr. / Bluff Creek Blvd. & Audubon Rd. (CSAH 15)	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		5	0	7	61	0	198	16	292	61	314	699	17
Queue (ft)		14			67	0	60	45	125	46	264	336	18
Mvmt Delay (sec)		10.7			18.2	0	6.3	7.1	5.6	1.5	16.4	13.9	1.8
Mvmt LOS		B			B	A	A	A	A	A	B	B	A
Delay (sec)	7.1	6.5			5.5			4.2			8.6		
LOS	A	B			A			A			B		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 2	PM PEAK - SCENARIO 2												
	2043 FULL BUILD												
	Overall	Eastbound			Westbound			Northbound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Butternut Dr. / Bluff Creek Blvd. & Audubon Rd. (CSAH 15)													
Volume (veh)		7	1	9	61	6	192	28	280	61	312	697	10
Queue (ft)		33			44	0	53	44	70	32	146	160	18
Mvmt Delay (sec)		11.1			18.9	14.2	7	5.8	5.3	1.8	9.4	10.1	0.1
Mvmt LOS		B			B	B	A	A	A	A	A	B	A
Delay (sec)	8.7	11.1			10.0			4.8			9.8		
LOS	A	B			A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 2	PM PEAK - SCENARIO 3												
	2043 FULL BUILD												
Butternut Dr. / Bluff Creek Blvd. & Audubon Rd. (CSAH 15)	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		19	4	14	61	6	192	28	280	61	310	692	34
Queue (ft)		57			59	17	46	59	97	41	159	78	0
Mvmt Delay (sec)		11.8			19	14.2	7	5.8	5.3	1.8	9.4	10.1	1.7
Mvmt LOS		B			B	B	A	A	A	A	A	B	A
Delay (sec)	8.6	11.1			10.0			4.8			9.6		
LOS	A	B			A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

Table 26 Intersection 2 Full Build (2043) LOS and delay for Scenarios 1, 2, and 3.

INTERSECTION 3	PM PEAK - SCENARIO 1												
	2043 FULL BUILD												
	Overall	Eastbound			Westbound			Northbound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Butternut Dr. & Ironwood Blvd.													
Volume (veh)					24		0		1	22	0	0	
Queue (ft)					0			0			0		
Mvmt Delay (sec)					0.0			0.0			0.0		
Mvmt LOS					A	A	A	A	A	A	A	A	A
Delay (sec)	0.0				0.0			0.0			0.0		
LOS	A				A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 3	PM PEAK - SCENARIO 2												
	2043 FULL BUILD												
	Overall	Eastbound			Westbound			Northbound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Butternut Dr. & Ironwood Blvd.					24		18		4	22	5	1	
Volume (veh)					24		18		4	22	5	1	
Queue (ft)					0			0			26		
Mvmt Delay (sec)					0.0			0.0			0.0		
Mvmt LOS					A	A	A	A	A	A	A	A	A
Delay (sec)	0.0				0.0			0.0			0.0		
LOS	A				A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 3	PM PEAK - SCENARIO 3												
	2043 FULL BUILD												
	Overall	Eastbound			Westbound			Northbound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Butternut Dr. & Ironwood Blvd.													
Volume (veh)				24		12		4	22	7	1		
Queue (ft)					0			0			22		
Mvmt Delay (sec)					0.0			0.0			0.0		
Mvmt LOS					A	A	A	A	A	A	A	A	A
Delay (sec)	0.0				0.0			0.0			0.0		
LOS	A				A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

Table 27 Intersection 3 Full Build (2043) LOS and delay for Scenarios , 2, and 3.

INTERSECTION 4	PM PEAK - SCENARIO 1												
	2043 FULL BUILD												
	Overall	Eastbound			Westbound			Northbound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)				15		9		20	20	3	25		
Queue (ft)					48				0		0		
Mvmt Delay (sec)					9.4				0.0		8.3	0.0	
Mvmt LOS					A				A		A		
Delay (sec)	2.7				9.3			0.0			0.9		
LOS	A				A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 4	PM PEAK - SCENARIO 2												
	2043 FULL BUILD												
	Overall	Eastbound			Westbound			Northbound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)				15		3		17	23	3	23		
Queue (ft)					59				0		0		
Mvmt Delay (sec)					9.2				0.0		8.3	0.0	
Mvmt LOS					A				A		A		
Delay (sec)	2.3				9.2			0.0			0.9		
LOS	A				A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 4	PM PEAK - SCENARIO 3												
	2043 FULL BUILD												
	Overall	Eastbound			Westbound			Northbound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)				15		3		17	23	3	23		
Queue (ft)					44				0		0		
Mvmt Delay (sec)				9.2				0.0		8.3	0.0		
Mvmt LOS				A				A		A			
Delay (sec)	2.3				9.1			0.0			1.0		
LOS	A				A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

Table 28 Intersection 4 Full Build (2043) LOS and delay for Scenarios , 2, and 3.

INTERSECTION 5	PM PEAK - SCENARIO 1												
	2043 FULL BUILD												
Autumn Woods Dr. & Acorn Rd.	Overall	SE Bound			NW Bound			NE Bound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)			5	38	8	6		34		22			
Queue (ft)		44			47			44					
Mvmt Delay (sec)		6.7			7.3			7.3					
Mvmt LOS		A			A			A					
Delay (sec)	7.1	6.7			7.3			7.3					
LOS	A	A			A			A					

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 5	PM PEAK - SCENARIO 2												
	2043 FULL BUILD												
	Overall	SE Bound			NW Bound			NE Bound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Autumn Woods Dr. & Acorn Rd.													
Volume (veh)			5	36	8	6		34		22			
Queue (ft)		45			32			44					
Mvmt Delay (sec)		6.7			7.2			7.2					
Mvmt LOS		A			A			A					
Delay (sec)	7.0	6.7			7.3			7.3					
LOS	A	A			A			A					

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 5	PM PEAK - SCENARIO 3												
	2043 FULL BUILD												
	Overall	SE Bound			NW Bound			NE Bound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)			5	36	8	6		34		22			
Queue (ft)		43			37			54					
Mvmt Delay (sec)		6.7			7.2			7.2					
Mvmt LOS		A			A			A					
Delay (sec)	7.1	6.7			7.3			7.3					
LOS	A	A			A			A					

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

Table 29 Intersection 5 Full Build (2043) LOS and delay for Scenarios , 2, and 3.

INTERSECTION 6	PM PEAK - SCENARIO 1												
	2043 FULL BUILD												
Autumn Woods Dr. & Access A	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		0	6	3	56	0	0	2	0	22	0	0	0
Queue (ft)		0			0			0			0		
Mvmt Delay (sec)		0			7.3	0	0	0			0		
Mvmt LOS		A			A			A			A		
Delay (sec)	4.6	0.0			7.3			0.0			0.0		
LOS	A	A			A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 6	PM PEAK - SCENARIO 2												
	2043 FULL BUILD												
	Overall	Eastbound			Westbound			Northbound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Autumn Woods Dr. & Access A													
Volume (veh)		0	0	0	38	0	0	0	0	20	0	0	0
Queue (ft)		0			0			35			0		
Mvmt Delay (sec)		0			7.3	0	0	0			0		
Mvmt LOS		A			A			A			A		
Delay (sec)	4.7	0.0			7.3			0.0			0.0		
LOS	A	A			A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 6	PM PEAK - SCENARIO 3												
	2043 FULL BUILD												
	Overall	Eastbound			Westbound			Northbound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)		0	0	0	15	0	0	0	0	9	0	0	0
Queue (ft)		0			0			30			0		
Mvmt Delay (sec)		0			7.2	0	0	0			0		
Mvmt LOS		A			A			A			A		
Delay (sec)	4.3	0.0			7.2			0.0			0.0		
LOS	A	A			A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

Table 30 Intersection 6 Full Build (2043) LOS and delay for Scenarios , 2, and 3.

INTERSECTION 7	PM PEAK - SCENARIO 1												
	2043 FULL BUILD												
Audubon Road (CSAH 15) & Access B	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)				10					298			957	
Queue (ft)		0						0			0		
Mvmt Delay (sec)		18.4						0			0		
Mvmt LOS		C						A			A		
Delay (sec)	0.1	18.2						0.0			0.0		
LOS	A	C						A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 7	PM PEAK - SCENARIO 2												
	2043 FULL BUILD												
	Overall	Eastbound			Westbound			Northbound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Audubon Road (CSAH 15) & Access B		0	0	7					282			949	
Volume (veh)		0	0	7					282			949	
Queue (ft)		30						0			0		
Mvmt Delay (sec)		18.1						0			0		
Mvmt LOS		C						A			A		
Delay (sec)	0.1	18.1						0.0			0.0		
LOS	A	C						A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 7	PM PEAK - SCENARIO 3												
	2043 FULL BUILD												
	Overall	Eastbound			Westbound			Northbound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Audubon Road (CSAH 15) & Access B													
Volume (veh)													
Queue (ft)													
Mvmt Delay (sec)													
Mvmt LOS													
Delay (sec)													
LOS													

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

Table 31 Intersection 7 Full Build (2043) LOS and delay for Scenarios , 2, and 3.

INTERSECTION 8	PM PEAK - SCENARIO 1												
	2043 FULL BUILD												
	Overall	Eastbound			Westbound			Northbound			Southbound		
Pioneer Trail (Co. Rd. 14) & Acorn Rd.		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		22	562	23	31	438	26	10	0	17	15	1	25
Queue (ft)		36	243	36	40	146	21	0			26		
Mvmt Delay (sec)		14.3	31.4	1.9	20.5	22.2	2.2	0	10.7	0.7	6.9		
Mvmt LOS		B	C	A	C	C	A	A	B	A	A		
Delay (sec)	24.1	28.9			20.8			4.5			6.6		
LOS	C	C			C			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 8	PM PEAK - SCENARIO 2												
	2043 FULL BUILD												
	Overall	Eastbound			Westbound			Northbound			Southbound		
Pioneer Trail (Co. Rd. 14) & Acorn Rd.		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		22	562	23	31	438	26	10	0	17	15	1	26
Queue (ft)		52	290	36	41	191	13	26			15		
Mvmt Delay (sec)		14.3	31.4	1.9	20.5	22.2	2.2	0	10.7	0.7	6.6		
Mvmt LOS		B	C	A	C	C	A	A	B	A	A		
Delay (sec)	24.1	28.9			20.8			4.5			6.6		
LOS	C	C			C			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

INTERSECTION 8	PM PEAK - SCENARIO 3												
	2043 FULL BUILD												
	Overall	Eastbound			Westbound			Northbound			Southbound		
Pioneer Trail (Co. Rd. 14) & Acorn Rd.		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		22	562	23	31	438	26	10	0	17	15	1	26
Queue (ft)		163	250	48	34	260	17	27			21		
Mvmt Delay (sec)		14.2	30.6	1.9	19.7	22	2.2	0	10.7	0.7	6.6		
Mvmt LOS		B	C	A	B	C	A	A	B	A	A		
Delay (sec)	24.1	28.9			20.8			4.5			6.6		
LOS	C	C			C			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).

Table 32 Intersection 8 Full Build (2043) LOS and delay for Scenarios , 2, and 3.

2043 NO BUILD CONDITION

INTERSECTION 1	PM PEAK												
	2043 NO BUILD												
	Overall	Eastbound			Westbound			Northbound			Southbound		
L		T	R	L	T	R	L	T	R	L	T	R	
Autumn Woods Dr. & Audubon Rd. (CSAH 15)													
Volume (veh)		9		4				5	479			949	10
Queue (ft)		30						0			0		
Mvmt Delay (sec)		32.9						11.1	0.0			0.0	
Mvmt LOS		D						B	A			A	A
Delay (sec)	0.3	32.9						0.1			0.0		
LOS	A	D						A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).
Table 33 Intersection 1 No Build (2043) LOS and delay.

INTERSECTION 2	PM PEAK												
	2043 NO BUILD												
Butternut Dr. / Bluff Creek Blvd. & Audubon Rd. (CSAH 15)	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		5	0	7	61	0	192	16	280	61	310	692	10
Queue (ft)		0			36	0	53	69	82	36	134	122	0
Mvmt Delay (sec)		6.1			19.1	0	1.6	4.8	5.2	1.7	9.1	9.5	0.1
Mvmt LOS		A			B	A	A	A	A	A	A	A	A
Delay (sec)	7.7	6.1			5.9			4.6			9.3		
LOS	A	A			A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).
Table 34 Intersection 2 No Build (2043) LOS and delay.

INTERSECTION 3	PM PEAK												
	2043 NO BUILD												
Butternut Dr. & Ironwood Blvd.	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)					24		0		1	22	0	0	
Queue (ft)					0			0			0		
Mvmt Delay (sec)					0			0			0		
Mvmt LOS					A			A			A		
Delay (sec)	0.0				0.0			0.0			0.0		
LOS	A				A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).
 Table 35 Intersection 3 No Build (2043) LOS and delay.

INTERSECTION 4	PM PEAK												
	2043 NO BUILD												
Ironwood Blvd. & Autumn Woods Dr.	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)					14		3		17	20	3	23	
Queue (ft)					64				0		0		
Mvmt Delay (sec)					9.1				0.0		8.3	0.0	
Mvmt LOS					A				A		A		
Delay (sec)	2.3				9.1			0.0			0.9		
LOS	A				A			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).
 Table 36 Intersection 4 No Build (2043) LOS and delay.

INTERSECTION 5	PM PEAK												
	2043 NO BUILD												
Autumn Woods Dr. & Acorn Rd.	Overall	SE Bound			NW Bound			NE Bound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)			5	35	8	6		31		22			
Queue (ft)		45			41			42					
Mvmt Delay (sec)		6.7			7.2			7.2					
Mvmt LOS		A			A			A					
Delay (sec)	7.0	6.7			7.2			7.2					
LOS	A	A			A			A					

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).
 Table 37 Intersection 5 No Build (2043) LOS and delay.

INTERSECTION 8	PM PEAK												
	2043 NO BUILD												
Pioneer Trail (Co. Rd. 14) & Acorn Rd.	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		19	562	23	31	438	26	10	0	17	15	1	25
Queue (ft)		37	210	40	62	289	13	0	15	3	0	24	0
Mvmt Delay (sec)		13.9	30.6	1.9	19.7	22	2.2	0	10.7	0.7	0	6.7	0
Mvmt LOS		B	C	A	C	C	A	A	B	A	A	A	A
Delay (sec)	24.2	29.0			20.8			4.5			6.7		
LOS	C	C			C			A			A		

Source: Data was analyzed using Synchro (HCM 6th Edition) and Sim Traffic (queue).
 Table 38 Intersection 8 No Build (2043) LOS and delay.

LEVEL OF SERVICE AND DELAY COMPARISON

Tables 39 to 45 provide side-by-side comparisons in the change in delay and level of service for the studied intersections' approaches.

	Intersection 1 Autumn Woods Dr. & Audubon Rd. (CSAH 15)	PM PEAK												
		Overall	Eastbound			Westbound			Northbound			Southbound		
			L	T	R	L	T	R	L	T	R	L	T	R
Existing (2021)	Delay (sec)	0.2	20.7						0.1			0.0		
	LOS	A	C						A			A		
Scenario 1 (2023)	Delay (sec)	1.0	27.7						0.6			0.0		
	LOS	A	D						A			A		
Scenario 2 (2023)	Delay (sec)	0.7	25.7						0.1			0.0		
	LOS	A	D						A			A		
Scenario 3 (2023)	Delay (sec)	0.7	25.4						0.1			0.0		
	LOS	A	D						A			A		
No Build (2023)	Delay (sec)	0.2	21.6						0.1			0.0		
	LOS	A	C						A			A		
Scenario 1 (2043)	Delay (sec)	1.3	42.0						0.5			0.0		
	LOS	A	E						A			A		
Scenario 2 (2043)	Delay (sec)	1.0	43.1						0.1			0.0		
	LOS	A	E						A			A		
Scenario 3 (2043)	Delay (sec)	0.6	39.8						0.1			0.0		
	LOS	A	E						A			A		
No Build (2043)	Delay (sec)	0.3	32.9						0.1			0.0		
	LOS	A	D						A			A		

Table 39 Intersection 1 Comparison Tables.

	Intersection 2	PM PEAK												
	Butternut Dr./ Bluff Creek Blvd. & Audubon Rd. (CSAH 15)	Overall	Eastbound			Westbound			Northbound			Southbound		
			L	T	R	L	T	R	L	T	R	L	T	R
Existing (2021)	Delay (sec)	6.2	9.3			5.6			4.2			7.1		
	LOS	A	A			A			A			A		
Scenario 1 (2023)	Delay (sec)	6.8	0.2			6.0			7.4			6.9		
	LOS	A	A			A			A			A		
Scenario 2 (2023)	Delay (sec)	7.8	14.9			12.3			7.1			6.8		
	LOS	A	B			B			A			A		
Scenario 3 (2023)	Delay (sec)	10.5	13.3			12.6			8.0			10.9		
	LOS	B	B			B			A			B		
No Build (2023)	Delay (sec)	5.4	5.5			4.9			3.9			6.1		
	LOS	A	A			A			A			B		
Scenario 1 (2043)	Delay (sec)	7.1	6.5			5.5			4.2			8.6		
	LOS	A	B			A			A			B		
Scenario 2 (2043)	Delay (sec)	8.7	11.1			10.0			4.8			9.8		
	LOS	A	B			A			A			A		
Scenario 3 (2043)	Delay (sec)	8.6	11.1			10.0			4.8			9.6		
	LOS	A	B			A			A			A		
No Build (2043)	Delay (sec)	7.7	6.1			5.9			4.6			9.3		
	LOS	A	A			A			A			A		

Table 40 Intersection 2 Comparison Tables.

	Intersection 3 Butternut Dr. & Ironwood Blvd.	PM PEAK												
		Overall	Eastbound			Westbound			Northbound			Southbound		
			L	T	R	L	T	R	L	T	R	L	T	R
Existing (2021)	Delay (sec)	0.0				0.0			0.0			0.0		
	LOS	A				A			A			A		
Scenario 1 (2023)	Delay (sec)	0.0				0.0			0.0			0.0		
	LOS	A				A			A			A		
Scenario 2 (2023)	Delay (sec)	0.0				0.0			0.0			0.0		
	LOS	A				A			A			A		
Scenario 3 (2023)	Delay (sec)	0.0				0.0			0.0			0.0		
	LOS	A				A			A			A		
No Build (2023)	Delay (sec)	0.0				0.0			0.0			0.0		
	LOS	A				A			A			A		
Scenario 1 (2043)	Delay (sec)	0.0				0.0			0.0			0.0		
	LOS	A				A			A			A		
Scenario 2 (2043)	Delay (sec)	0.0				0.0			0.0			0.0		
	LOS	A				A			A			A		
Scenario 3 (2043)	Delay (sec)	0.0				0.0			0.0			0.0		
	LOS	A				A			A			A		
No Build (2043)	Delay (sec)	0.0				0.0			0.0			0.0		
	LOS	A				A			A			A		

Table 41 Intersection 3 Comparison Tables.

	Intersection 4 Ironwood Blvd. & Autumn Woods Dr.	Overall	PM PEAK											
			Eastbound			Westbound			Northbound			Southbound		
			L	T	R	L	T	R	L	T	R	L	T	R
Existing (2021)	Delay (sec)	2.5				9.1			0.0			1.2		
	LOS	A				A			A			A		
Scenario 1 (2023)	Delay (sec)	2.3				9.1			0.0			1.2		
	LOS	A				A			A			A		
Scenario 2 (2023)	Delay (sec)	2.4				9.0			0.0			1.2		
	LOS	A				A			A			A		
Scenario 3 (2023)	Delay (sec)	2.4				9.0			0.0			1.2		
	LOS	A				A			A			A		
No Build (2023)	Delay (sec)	2.4				9.0			0.0			1.2		
	LOS	A				A			A			A		
Scenario 1 (2043)	Delay (sec)	2.7				9.3			0.0			0.9		
	LOS	A				A			A			A		
Scenario 2 (2043)	Delay (sec)	2.3				9.2			0.0			0.9		
	LOS	A				A			A			A		
Scenario 3 (2043)	Delay (sec)	2.3				9.1			0.0			1.0		
	LOS	A				A			A			A		
No Build (2043)	Delay (sec)	2.3				9.1			0.0			0.9		
	LOS	A				A			A			A		

Table 42 Intersection 4 Comparison Tables.

	Intersection 5	PM PEAK												
	Autumn Woods Dr. & Acorn Rd.	Overall	Eastbound			Westbound			Northbound			Southbound		
			L	T	R	L	T	R	L	T	R	L	T	R
Existing (2021)	Delay (sec)	6.9	6.6			7.2			7.1					
	LOS	A	A			A			A					
Scenario 1 (2023)	Delay (sec)	7.0	6.6			7.2			7.3					
	LOS	A	A			A			A					
Scenario 2 (2023)	Delay (sec)	7.0	6.6			7.2			7.3					
	LOS	A	A			A			A					
Scenario 3 (2023)	Delay (sec)	7.0	6.6			7.2			7.3					
	LOS	A	A			A			A					
No Build (2023)	Delay (sec)	6.9	6.6			7.2			7.1					
	LOS	A	A			A			A					
Scenario 1 (2043)	Delay (sec)	7.1	6.7			7.3			7.3					
	LOS	A	A			A			A					
Scenario 2 (2043)	Delay (sec)	7.0	6.7			7.3			7.3					
	LOS	A	A			A			A					
Scenario 3 (2043)	Delay (sec)	7.1	6.7			7.3			7.3					
	LOS	A	A			A			A					
No Build (2043)	Delay (sec)	7.0	6.7			7.2			7.2					
	LOS	A	A			A			A					

Table 43 Intersection 5 Comparison Tables.

	Intersection 6	PM PEAK												
	Autumn Woods Dr. & Access A	Overall	Eastbound			Westbound			Northbound			Southbound		
			L	T	R	L	T	R	L	T	R	L	T	R
Existing (2021)	Delay (sec) LOS													
Scenario 1 (2023)	Delay (sec) LOS	4.9 A	0.0 A			7.3 A			0.0 A			0.0 A		
Scenario 2 (2023)	Delay (sec) LOS	4.7 A	0.0 A			7.3 A			0.0 A			0.0 A		
Scenario 3 (2023)	Delay (sec) LOS	4.6 A	0.0 A			7.3 A			0.0 A			0.0 A		
No Build (2023)	Delay (sec) LOS													
Scenario 1 (2043)	Delay (sec) LOS	4.6 A	0.0 A			7.3 A			0.0 A			0.0 A		
Scenario 2 (2043)	Delay (sec) LOS	4.7 A	0.0 A			7.3 A			0.0 A			0.0 A		
Scenario 3 (2043)	Delay (sec) LOS	4.6 A	0.0 A			7.3 A			0.0 A			0.0 A		
No Build (2043)	Delay (sec) LOS													

Table 44 Intersection 6 No Build (2043) LOS and delay.

	Intersection 7	PM PEAK												
	Audubon Rd. (CSAH 15) & Access B	Overall	Eastbound			Westbound			Northbound			Southbound		
			L	T	R	L	T	R	L	T	R	L	T	R
Existing (2021)	Delay (sec) LOS													
Scenario 1 (2023)	Delay (sec) LOS	0.1 A	14.5 B			0.0 0.0			0.0 A			0.0 A		
Scenario 2 (2023)	Delay (sec) LOS	0.1 A	14.4 B			0.0 0.0			0.0 A			0.0 A		
Scenario 3 (2023)	Delay (sec) LOS													
No Build (2023)	Delay (sec) LOS													
Scenario 1 (2043)	Delay (sec) LOS	0.1 A	18.1 C			0.0 0.0			0.0 A			0.0 A		
Scenario 2 (2043)	Delay (sec) LOS	0.1 A	18.1 C			0.0 0.0			0.0 A			0.0 A		
Scenario 3 (2043)	Delay (sec) LOS													
No Build (2043)	Delay (sec) LOS													

Table 45 Intersection 7 No Build (2043) LOS and delay.

	Intersection 8	PM PEAK												
	Pioneer Trail (Co. Rd. 14) & Acorn Rd.	Overall	Eastbound			Westbound			Northbound			Southbound		
			L	T	R	L	T	R	L	T	R	L	T	R
Existing (2021)	Delay (sec)	16.0	17.6			15.6			4.2			8.5		
	LOS	B	B			B			A			A		
Scenario 1 (2023)	Delay (sec)	16.4	18.1			16.0			4.2			8.4		
	LOS	B	B			B			A			A		
Scenario 2 (2023)	Delay (sec)	16.4	18.1			15.9			4.2			8.6		
	LOS	B	B			B			A			A		
Scenario 3 (2023)	Delay (sec)	16.4	18.1			16.0			4.2			8.4		
	LOS	B	B			B			A			A		
No Build (2023)	Delay (sec)	16.5	18.1			16.0			4.2			8.5		
	LOS	B	B			B			A			A		
Scenario 1 (2043)	Delay (sec)	24.1	28.9			20.8			4.5			6.6		
	LOS	C	C			C			A			A		
Scenario 2 (2043)	Delay (sec)	24.1	28.9			20.8			4.5			6.6		
	LOS	C	C			C			A			A		
Scenario 3 (2043)	Delay (sec)	24.1	28.9			20.8			4.5			6.6		
	LOS	C	C			C			A			A		
No Build (2043)	Delay (sec)	24.2	29.0			20.8			4.5			6.7		
	LOS	C	C			C			A			A		

Table 46 Intersection 8 Comparison Tables.

The background traffic growth throughout the development is expected to cause increased delays throughout the study area. As traffic continues to increase, longer delays will be experienced but will be minor with the exception of the Eastbound approach at Intersection 1. The approach is currently operating at a low LOS and experiencing delays due to the high traffic volume on the major approaches of Audubon Road (CSAH 15). If Intersection 1 is not improved, it is likely that traffic will naturally redistribute throughout the site and a higher volume of traffic will route to Intersection 2 to enter the residential development.

According to the completed traffic modeling, the new traffic generated as a result of the proposed residential development will increase to varying degrees at the studied intersections;

- Intersection 1 will operate at a similar overall intersection delay and LOS A. The intersection will continue to see a decrease in the LOS and increase in delay at the eastbound approach. The intersection functions at the highest rating for the 2021 Existing and 2023 No Build scenarios and the lowest rating for the Full Build 2043 Scenario 2. The overall intersection will continue to function at a LOS A with the eastbound approach declining from LOS C to LOS E as delays increase. The proposed residential development at Full Build (2043) conditions, will increase the eastbound approach delay by 3.1-10.2 seconds from the No Build (2043). The overall intersection will increase in delay by 0.3-1 second from the No Build (2043) to Full Build (2043) conditions.
- Intersection 2 will operate at a LOS A or B for the 2023 Opening, 2043 Full Build, and 2023 and 2043 No Build scenarios. For all scenarios, the splits were optimized within the signal timing to better service traffic. The overall intersection will experience the least delay with Scenario 3 at 2023 Opening and 2043 Full Build conditions and the most delay with Scenario 2 at 2023 Opening and 2043 Full Build.
- Intersection 3 does not experience enough traffic currently or in the future to experience delays or queuing. Currently the intersection is not signalized with the northbound and southbound traffic yielding and westbound moving freely. With the low traffic volumes, the intersection is anticipated to minorly be impacted as traffic continues to grow. If Intersection 1 is not geometrically altered, it is likely that traffic entering the existing or proposed development will most likely redirect from Intersection 1 to Intersection 3 and drive a longer distance in lieu of experiencing longer delays at Intersection 1.
- Intersection 4 overall and each approach will operate at a LOS A for all scenarios. In the 2021 Existing and 2023 No Build scenarios, where delays increase marginally. Scenario 2 and Scenario 3 for 2023 Opening and 2043 Full Build will result in similar delays to one another. Scenario 1 will cause a small increase in delay experienced by vehicles considering that traffic will only access the proposed development via Intersection 6. Traffic volumes will utilize Intersections 4 from the County roadways to access the development.
- Intersection 5 will operate at a LOS A for the Opening, Full Build, and No Build Scenarios. All approaches will operate at a similar LOS with minor delay change as a result of the proposed development.
- Intersection 6 will be established from the proposed development. It is assumed that the intersection would be aligned with the existing access for the multi-family residential development to the north. The multi-family access was not analyzed but the traffic generated by the multi-family development was captured at other studied intersections, namely Intersections 1 and 4. Scenario 1 routes a majority of the traffic to this intersection because there is no other entry point to the proposed development. The intersection operates at a similar LOS and delay across all Scenarios.

- Intersection 7, like Intersection 6, is created due to the proposed development. The right-out access is permitted per Carver County access management guidelines. Intersection 7 would not need to be constructed for Scenario 3. The eastbound approach will experience delays of approximately 14 seconds (LOS B) for Scenarios 1 and 2 at 2023 Opening and delays approximately 18 seconds (LOS C) at 2043 Full Build conditions. These delays are due to higher traffic volumes along the southbound approach, limiting gap times for drivers to make the right turn, similar to the delays experienced at Intersection 1.
- Intersection 8 is currently operating at a LOS B with delays experienced by the eastbound and westbound traffic. As background traffic continues to increase, the approaches will experience longer delays. The traffic queue lengths are not expected to exceed storage bay capacities, but the Intersection signal timing can be updated to shorten the delays experienced.

It is assumed that the cycle length at the existing signalized intersection, Intersection 2 and 8, will be recalibrated to maintain an appropriate level of service and optimize split time. For the study, the signal split times were optimized for each scenario except existing. Modifying cycle lengths and split times can further improve LOS and delay at the signalized intersections.

The addition of the proposed traffic as a result of the Reserve of Autumn Woods residential development will have minimal effect on level of service and delay currently experienced and projected to be experienced. To reduce the delay experienced at the Intersection 1, it is recommended to the developer, City, and County that Scenario 3 is proceeded with for the development accesses. Scenario 2 and 3 provide similar LOS and delay times for a majority of the intersections at 2023 Opening and 2043 Full Build Scenarios. The right-out access at Intersection 7 does not provide a significant impact in decreasing delays or improving the LOS across the study area.

Crash Analysis

Crash data was obtained from the Minnesota Crash Mapping Analysis Tool for the past 5 years within the vicinity of the study area. Between 2016 and 2021 there have been a total of 49 crashes; 1 type A, 5 type B, 5 type C, and 38 type N. Of the 49 crashes, 9 crashes were at or near Intersection 2, 2 crashes were along Autumn Woods Drive to the North, 3 were near the intersection of Audubon Road (CSAH 15) and Autumn Woods South, 1 at Intersection 8, and the remaining were along Pioneer Trail (CSAH 14), west or east of the site.

These crash types are defined in the Guide to MN Crash Data Files and the MN Law Enforcement Accident Report Instruction Manual as described in the following table.

Crash Type	Severity Type	Description
Type K	Killed	A fatality resulted.
Type A	Incapacitating injury	Any injury, other than a fatal injury, which prevents the injured person from walking, driving, or normally continuing the activities the person was capable of performing before the injury occurred.
Type B	Non-incapacitating injury	Any injury, other than a fatal injury or an incapacitating injury, which is evident to the observers at the scene of the accident in which the injury occurred.
Type C	Possible injury	Any injury reported or claimed which is not a fatal injury, incapacitating injury or non-incapacitating evident injury.
Type N	No apparent injury	Property damage only.

At Intersection 2, a third of the crashes were rear-end collisions. 22% of the crashes were caused by a driver who failed to yield to the right-of-way while attempting to make a left turn and one crash was caused by a driver losing control during snow conditions. There were no other apparent crash patterns within the analyzed crash data. The recorded crash data at Intersection 2 does not indicate a need for geometric or traffic control changes to the intersection due to safety.

The two crashes reported along the North of Autumns Woods Drive were a stolen vehicle that was crashed into a tree within the neighborhood and reported by a pedestrian and the other was caused by a driver backing out of a driveway and hitting the owner and vehicle. The crash is type A. There are no patterns between the hit-and-run and improper backing were due to the geometry of the roadway.

Near the Intersection of Autumn Woods South and Audubon Road (CSAH 15). One crash was due to the driver being under the influence, one was due to snow conditions where a vehicle failed to stop to a parked vehicle where the driver was clearing their vehicle, and the final was a collision between two vehicles where the southbound left turning vehicle made an improper turn and swiped the front of the westbound vehicle at the intersection.

The crash near Intersection 8 was located in the school parking lot where one driver failed to yield to thru traffic while backing up out of the parking lot.

RECOMMENDATIONS

The proposed single-family residential development located along Audubon Road (CSAH 15) with indirect access to Pioneer Trail (CSAH 14). The traffic will utilize on-site, internal roads to access the development. At the time of this study it is recommended to evaluate these improvements to the public roadway network:

- At the time of the study, low traffic volumes are present on the eastbound approach and higher traffic volumes are present on Audubon Road (CSAH 15). Due to the higher traffic volumes on Audubon Road (CSAH 15), there are fewer gaps for eastbound vehicles to turn left and right onto Audubon Road (CSAH 15). Due to the low volumes on the minor approach (eastbound traffic on Autumn Woods Drive), a signal is not warranted. In addition, the NCHRP 457 Warrant for a Major Road Left Turn Bay at a TWSC Intersection was evaluated. The percentage of left turns is around 1% of the total traffic generated through the intersection, and the left turn lane is not warranted. To better serve the eastbound traffic, it is recommended that dedicated left and right turn lanes be constructed for the eastbound traffic.
- To reduce the delay expected at the Intersection 1, proceeding with Scenario 3 is recommended. Scenario 3 provides the lowest LOS and delay times for Intersection 1 at 2023 Opening and 2043 Full Build Scenarios. The right-out access at Intersection 7 does not provide a significant impact in decreasing delays or improving the LOS across the study area.
 - Limiting the access into the development at Intersection 2, as shown in Scenario 1, may increase the use of alternative routes through the existing development due to the low LOS and high delays for the eastbound approach at Intersection 1. Scenario 2 or 3 would utilize existing road stub of Ironwood Boulevard and provide better connectivity without compromising safety at Intersection 1 or adding unnecessary traffic to alternative routes.
- The traffic signals at Intersection 2 and 8 should be reevaluated to optimize signal timing every 5 years or as future development occurs.
- The existing and proposed residential development serves pedestrian and bicycles throughout the study area with shared use trails, sidewalks, and parks. In addition, there a series of bus stops throughout the study area. To accommodate pedestrian and cyclist, the follow items may be considered by Jonathon Association and the City of Chaska regardless of the construction of the proposed development:
 - Install sidewalk along Autumn Woods Drive. The existing Autumn Woods development has an HOA with Jonathon Association. The Association and City may need to coordinate these improvements.
 - To address resident concerns of vehicles traveling above the speed limit throughout the development, the City and HOA may consider installing speed bumps mid-block of intersections to reduce travel speeds in the interim until sidewalk is constructed. Secondly, speed limit signs could be installed throughout the existing and proposed development.
 - Stripe pedestrian crosswalks at intersections to increase visibility to drivers. Additionally, ensure between the HOA and City that sight triangles for all intersections are not impeded by vegetation. Once pedestrian facilities are installed at the proposed development, a similar agreement should be established. Bicycle and pedestrian signage can also be established throughout the study area.
 - Where shared use trails are not provided and the existing roadway is wide enough, limit on-street parking and stripe bicycle lanes throughout the existing.

Appendix A: Preliminary Site Concept



NOTE:
THE CLARITY OF THESE PLANS DEPEND
UPON COLOR COPIES. IF THIS TEXT DOES
NOT APPEAR IN COLOR, THIS IS NOT AN
ORIGINAL PLAN SET AND MAY RESULT IN
MISINTERPRETATION.

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR
REPORT WAS PREPARED BY ME OR UNDER MY DIRECT
SUPERVISION AND THAT I AM A DULY LICENSED
PROFESSIONAL ENGINEER UNDER THE LAWS OF THE
STATE OF MINNESOTA.
JEREMY D. FOSS

DATE: _____ LIC. NO. 55871

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PROJECT

**LENNAR
RESERVE AT
AUTUMN WOODS**

CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

PROJECT NO.	21-24984
FILE NAME	24984 SITE
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

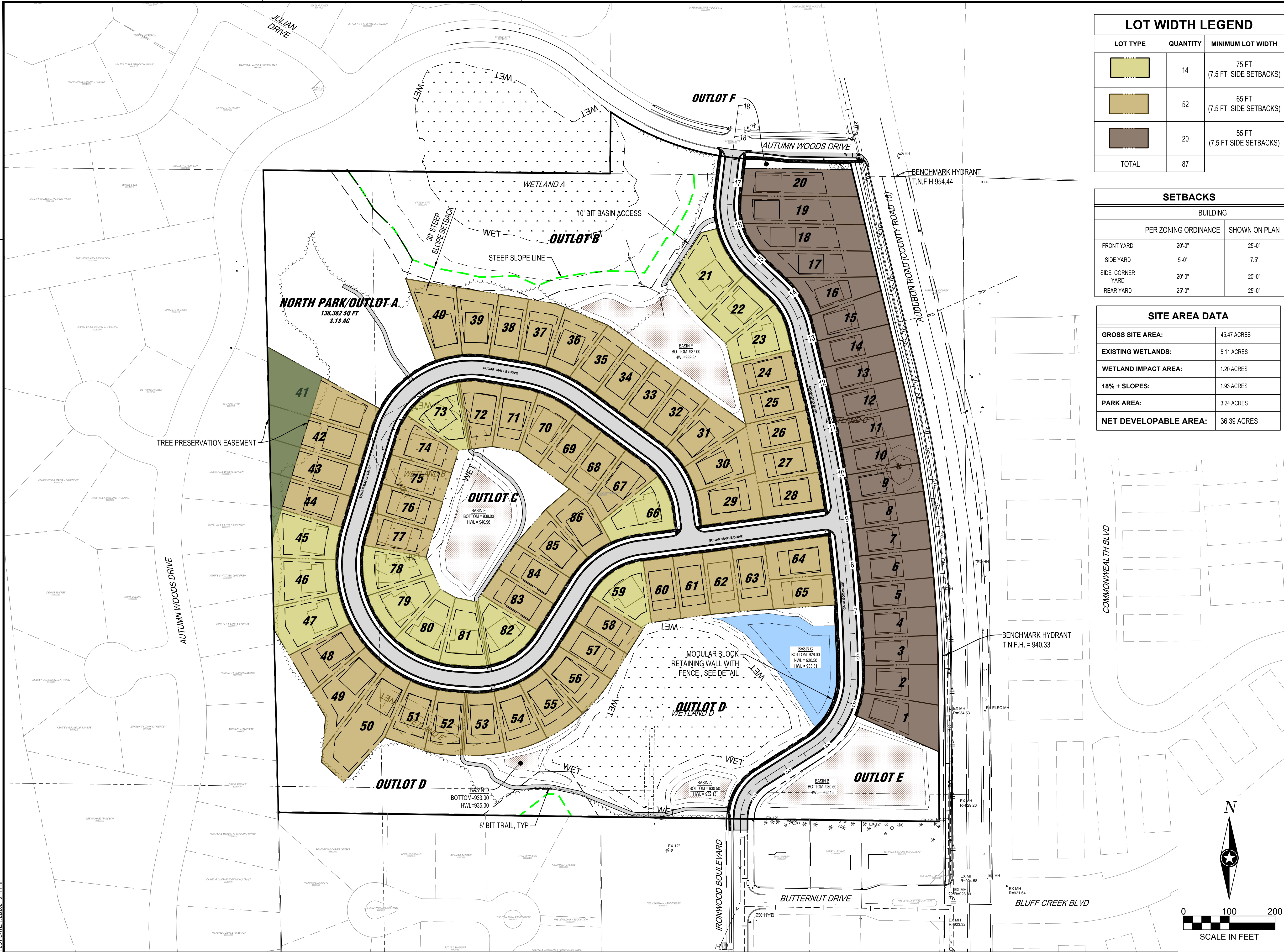
**OVERALL SITE
PLAN**

SHEET
17
OF 39

LOT WIDTH LEGEND		
LOT TYPE	QUANTITY	MINIMUM LOT WIDTH
	14	75 FT (7.5 FT SIDE SETBACKS)
	52	65 FT (7.5 FT SIDE SETBACKS)
	20	55 FT (7.5 FT SIDE SETBACKS)
TOTAL	87	

SETBACKS		
BUILDING		
PER ZONING ORDINANCE		SHOWN ON PLAN
FRONT YARD	20'-0"	25'-0"
SIDE YARD	5'-0"	7.5'
SIDE CORNER YARD	20'-0"	20'-0"
REAR YARD	25'-0"	25'-0"

SITE AREA DATA	
GROSS SITE AREA:	45.47 ACRES
EXISTING WETLANDS:	5.11 ACRES
WETLAND IMPACT AREA:	1.20 ACRES
18% + SLOPES:	1.93 ACRES
PARK AREA:	3.24 ACRES
NET DEVELOPABLE AREA:	36.39 ACRES



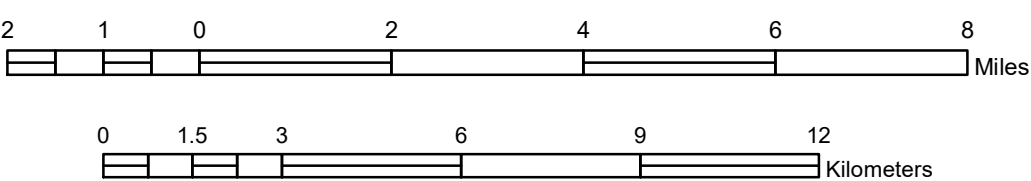
Appendix B: Project Location + Roadway Classification Map

FUNCTIONAL
CLASSIFICATION MAP
CARVER COUNTY
MINNESOTA

PREPARED BY THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF TRANSPORTATION SYSTEM MANAGEMENT

IN COOPERATION WITH
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

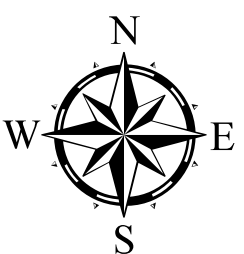
SCALE



1 in = 10,560 ft

DECEMBER 2020

Projection:
Transverse Mercator
NAD 1986
UTM Zone 15



North American Datum
of 1986

ROAD AND ROADWAY FEATURES

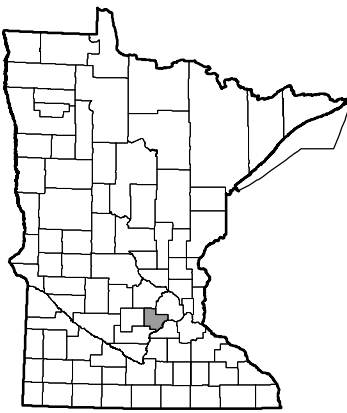
- INTERSTATE.....
- OTHER FREEWAY OR EXPRESSWAY.....
- PRINCIPAL ARTERIAL - OTHER.....
- MINOR ARTERIAL.....
- MAJOR COLLECTOR.....
- MINOR COLLECTOR.....
- LOCAL.....
- RAILWAY.....
- INTERSTATE.....
- US HIGHWAY.....
- MN HIGHWAY.....
- COUNTY STATE AID HIGHWAY.....
- COUNTY ROAD.....

Arrows near road shields indicate the start and end points of routes.

BOUNDARY FEATURES

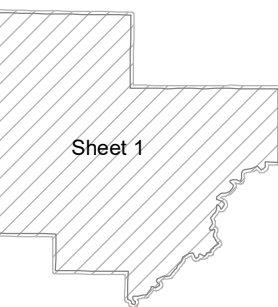
- STATE OF MINNESOTA.....
- COUNTY.....
- CIVIL TOWNSHIP.....

Outline Map of Minnesota showing
location of the County within the state.

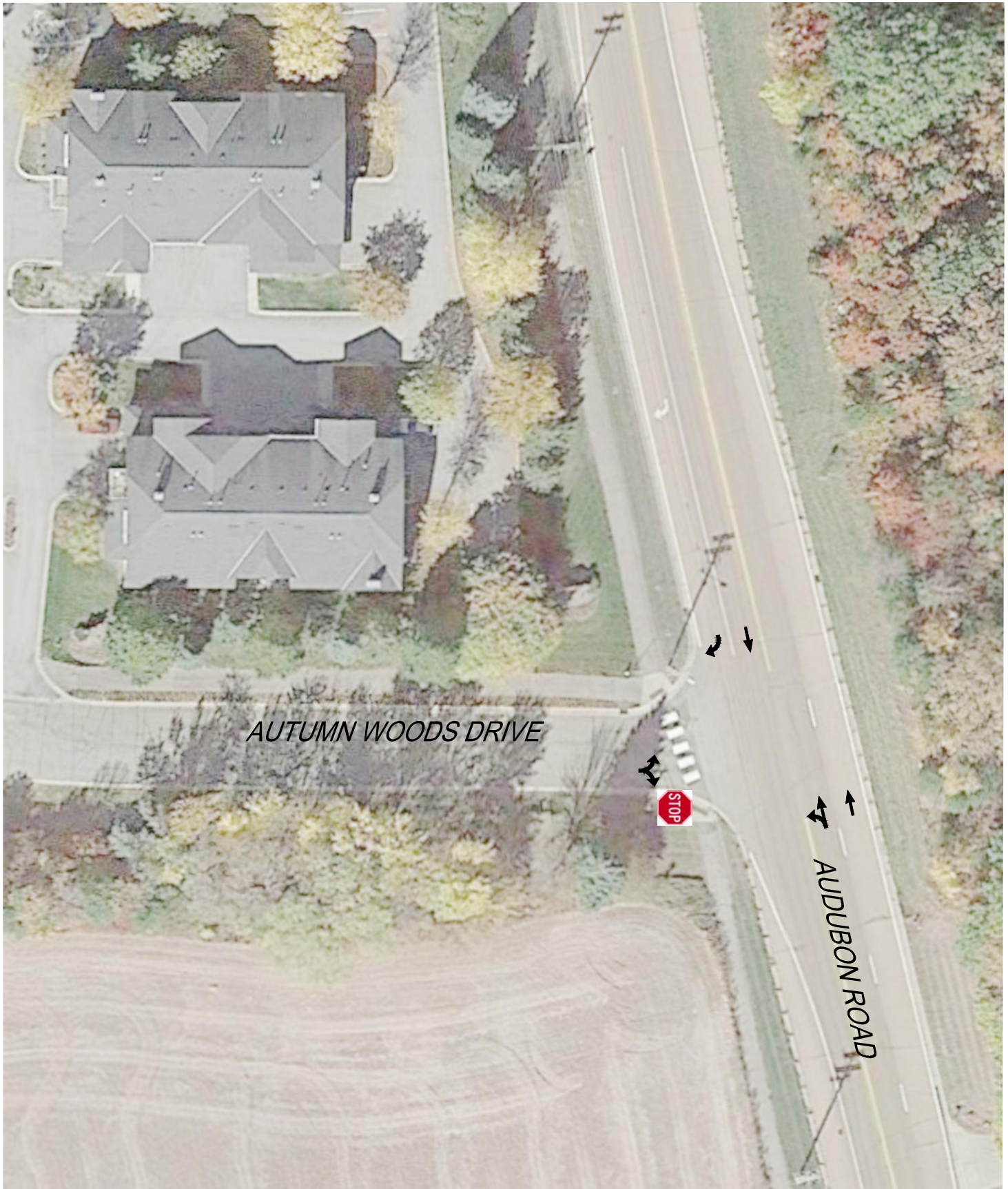


Outline Map of the County.

Area of this County 375.7 Sq. Miles
Land Area 354.33 Sq. Miles
2010 Total County Population 91,042



Appendix C: Intersection and Site Configuration Map



AUTUMN WOODS DRIVE + AUDUBON ROAD INTERSECTION

0 50 100
SCALE: 1" = 50 FEET



ISG

Architecture + Engineering + Environmental + Planning

9.B. Adopt Resolution 2021-67 and...

Packet Page 182 of...

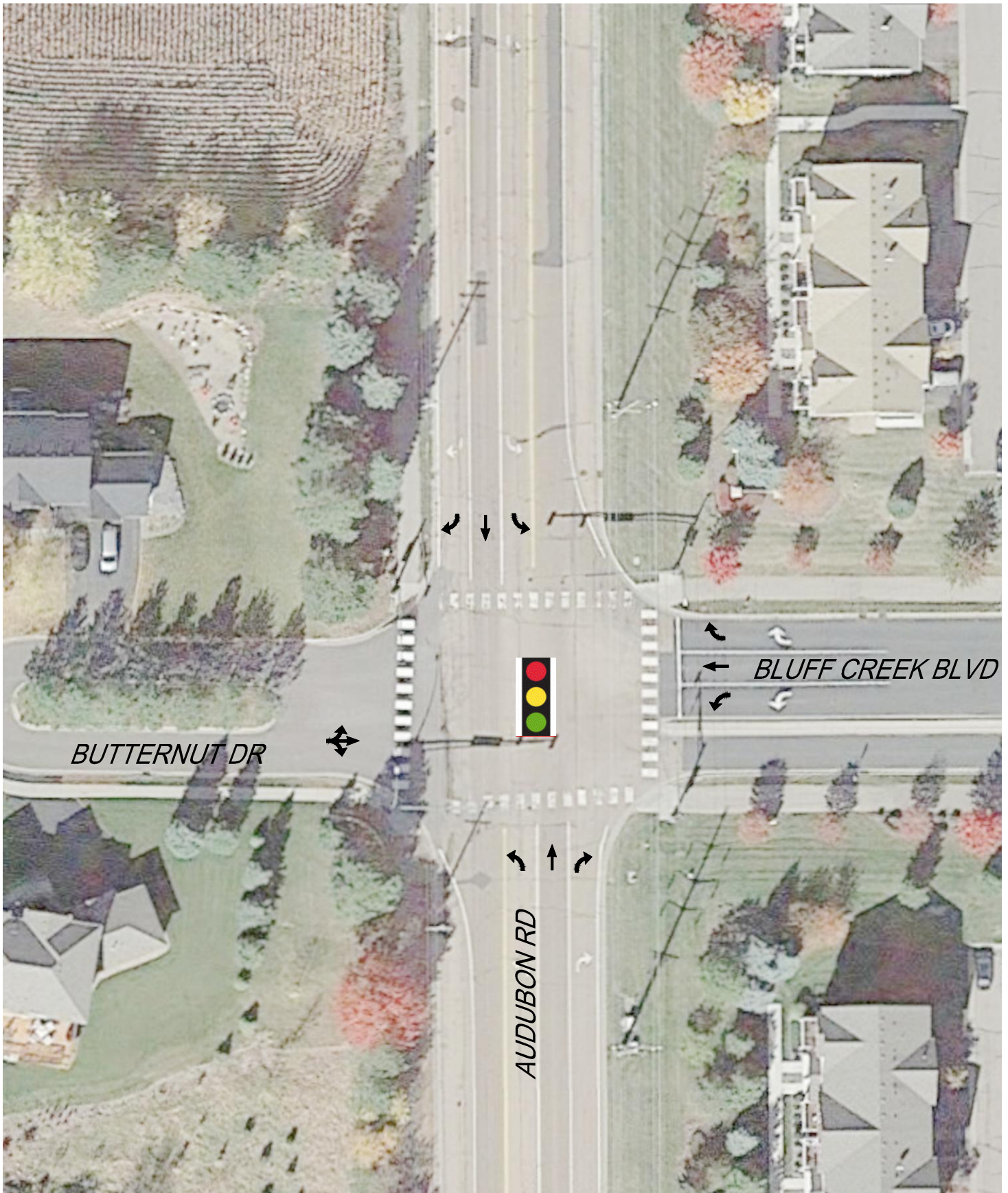
Page 158 of...

CAD FILE NAME: 24984 INTERSECTION EY-0115

Lennar Wagner Woods

Chaska, MN - 05/20/2021

ISG PROJECT NO. 2021-24984



AUDUBON RD + BLUFF CREEK BLVD + BUTTERNUT DR
INTERSECTION

0 50 100
SCALE: 1" = 50 FEET



ISG

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9.B. Adopt Resolution 2021-67 and...

Packet Page 183 of...

Page 159 of...

CAD FILE NAME: 24384 INTERSECTION EY-0115

Lennar Wagner Woods

Chaska, MN - 05/20/2021

ISG PROJECT NO. 2021-24984



BUTTERNUT DR + IRONWOOD BLVD INTERSECTION

0 50 100
SCALE: 1" = 50 FEET



ISG

Architecture + Engineering + Environmental + Planning

9.B. Adopt Resolution 2021-67 and...

Packet Page 184 of...

Page 160 of...

CAD FILE NAME: 24984 INTERSECTION EYEBITS

Lennar Wagner Woods

Chaska, MN - 05/20/2021

ISG PROJECT NO. 2021-24984



AUTUMN WOODS DR + IRONWOOD BLVD INTERSECTION



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9.B. Adopt Resolution 2021-67 and...

Packet Page 185 of...

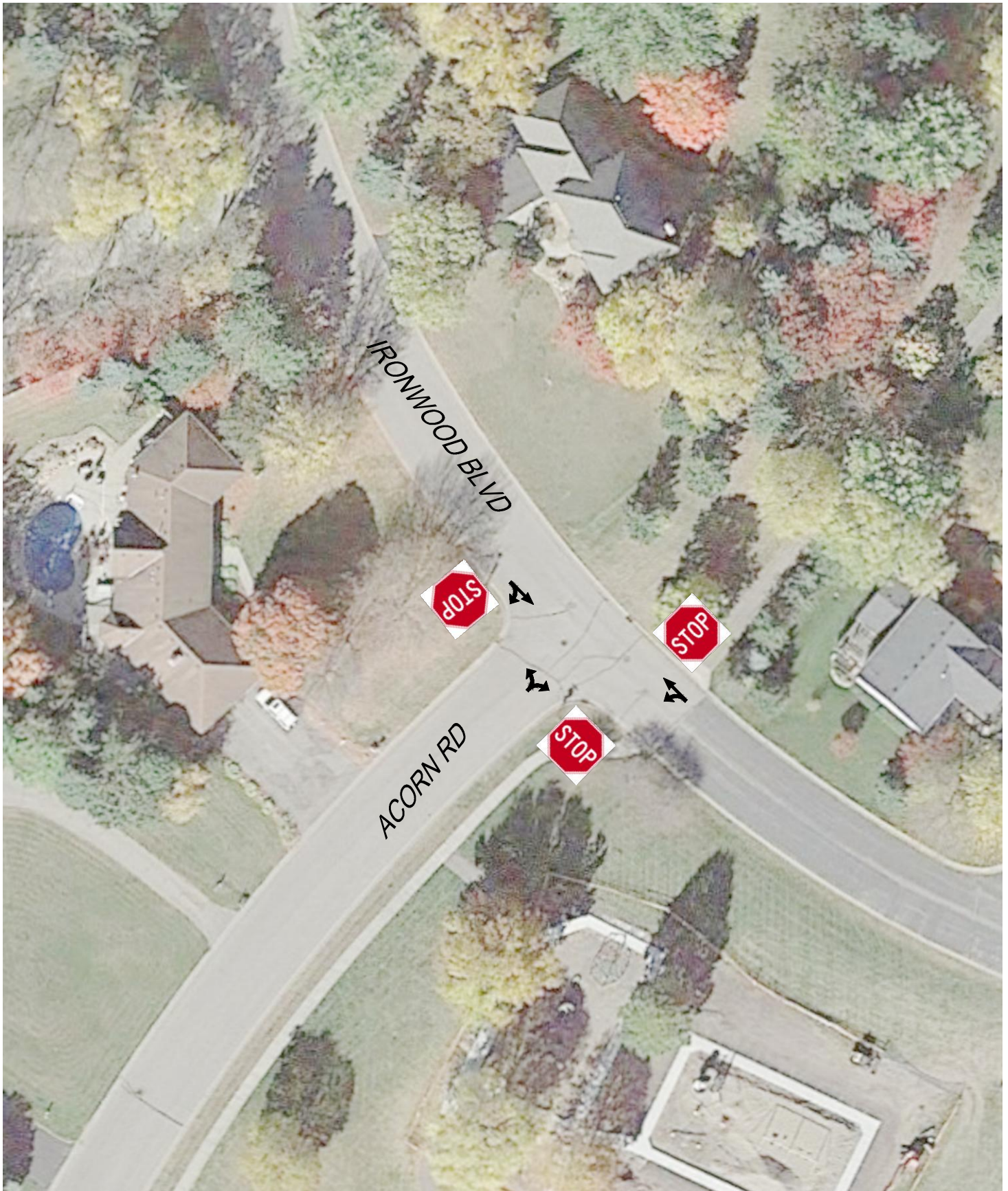
Page 161 of...

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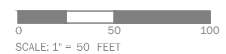
Lennar Wagner Woods

Chaska, MN - 05/20/2021

ISG PROJECT NO. 2021-24984



AUTUMN WOODS DR + ACORN RD INTERSECTION



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9.B. Adopt Resolution 2021-67 and...

Packet Page 186 of...

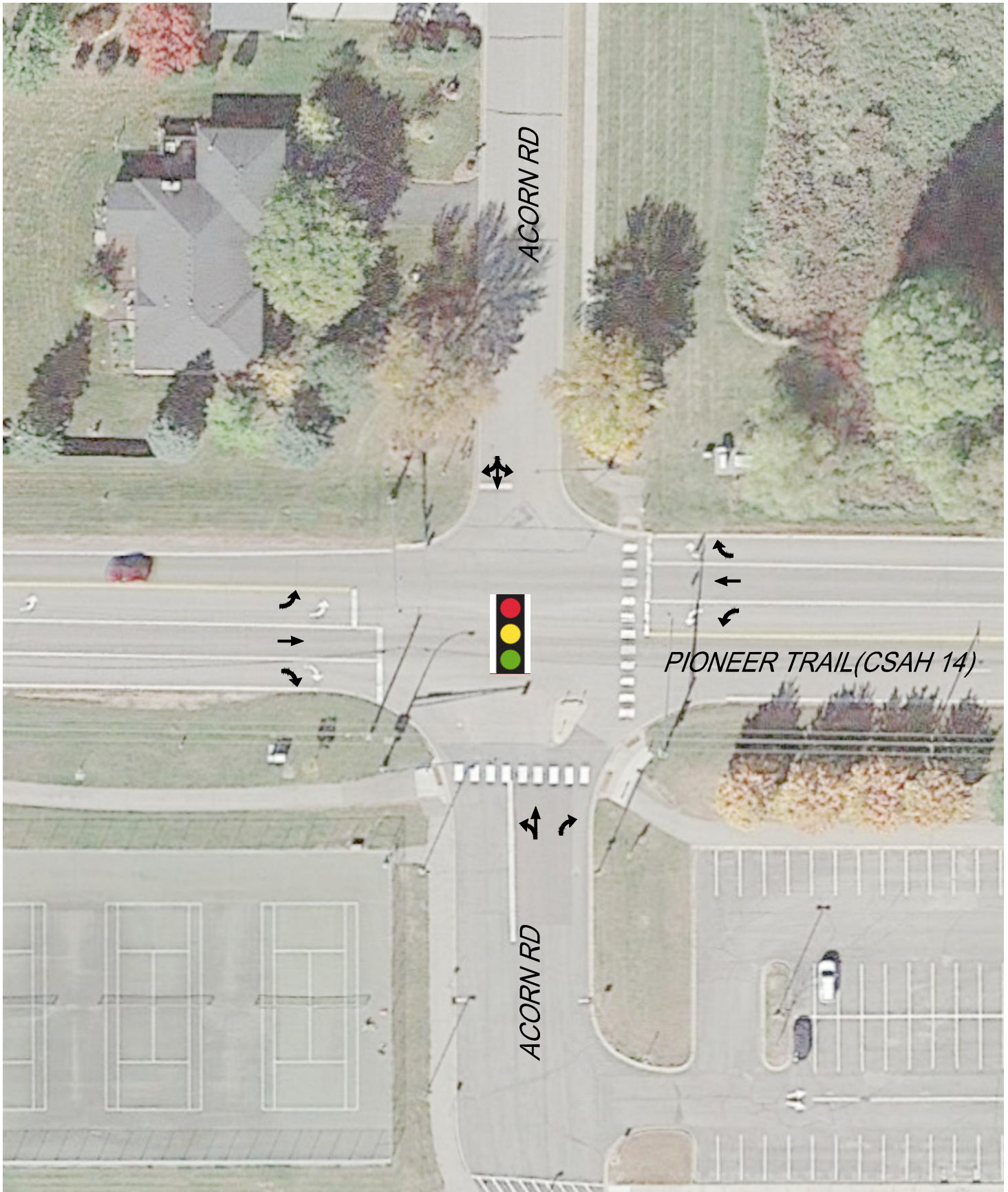
Page 162 of...

CAD FILE NAME: 24984 INTERSECTION EY-0115

Lennar Wagner Woods

Chaska, MN - 05/20/2021

ISG PROJECT NO. 2021-24984



PIONEER TRAIL (CSAH 14) + ACORN RD INTERSECTION

0 50 100
SCALE: 1" = 50 FEET



ISG

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9.B. Adopt Resolution 2021-67 and...

Packet Page 187 of...

Page 163 of...

CAD FILE NAME: 24984 INTERSECTION EY-0215

Lennar Wagner Woods

Chaska, MN - 05/20/2021

ISG PROJECT NO. 2021-24984



STUDY INTERSECTION

INTERSECTION MAP

0 250 500
SCALE: 1" = 500 FEET



ISG

Architecture + Engineering + Environmental + Planning

9.B. Adopt Resolution 2021-67 and...

Packet Page 188 of...

Page 164 of...

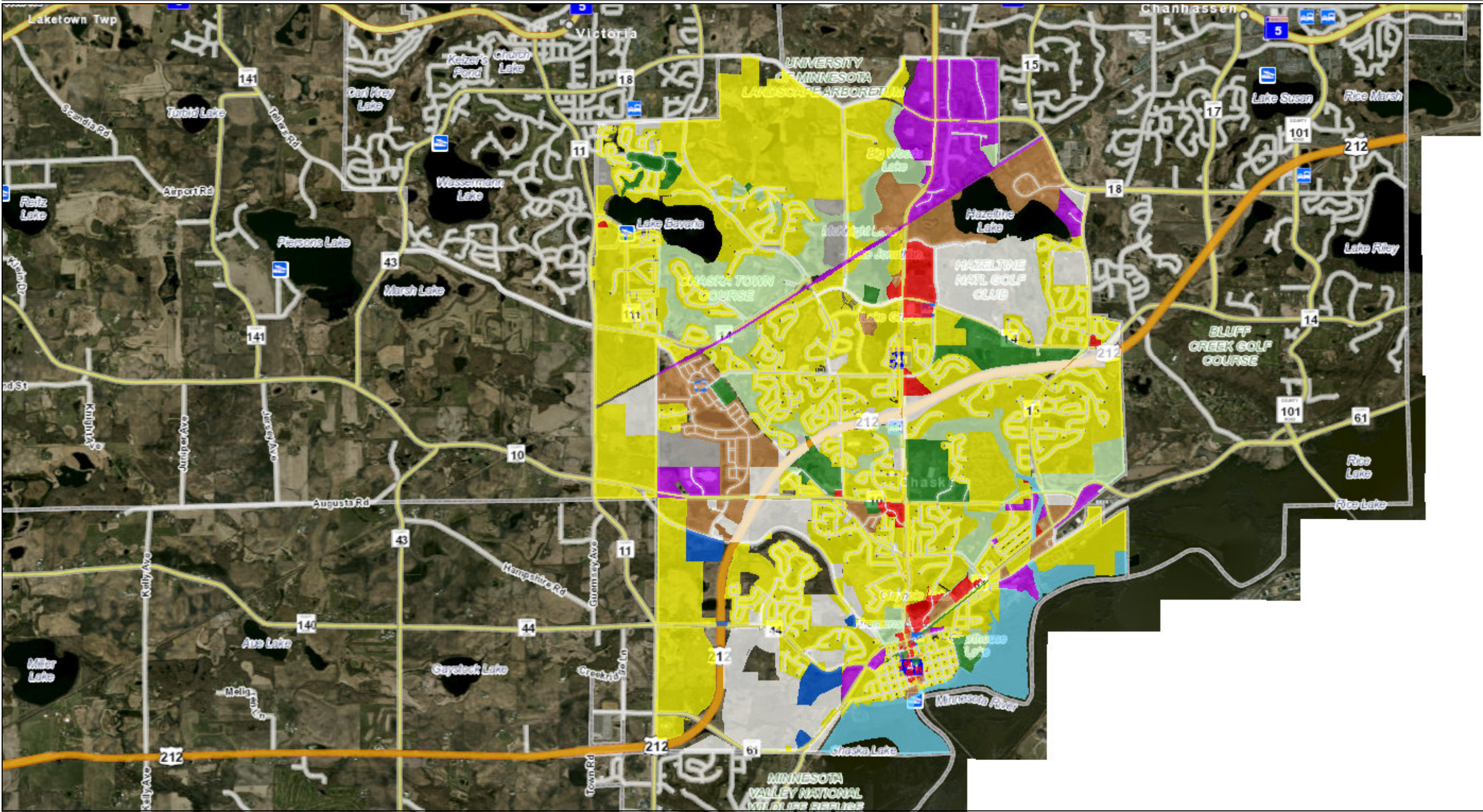
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Lennar Wagner Woods

Chaska, MN - 05/20/2021

ISG PROJECT NO. 2021-24984

Appendix D: City of Chaska Zoning Map



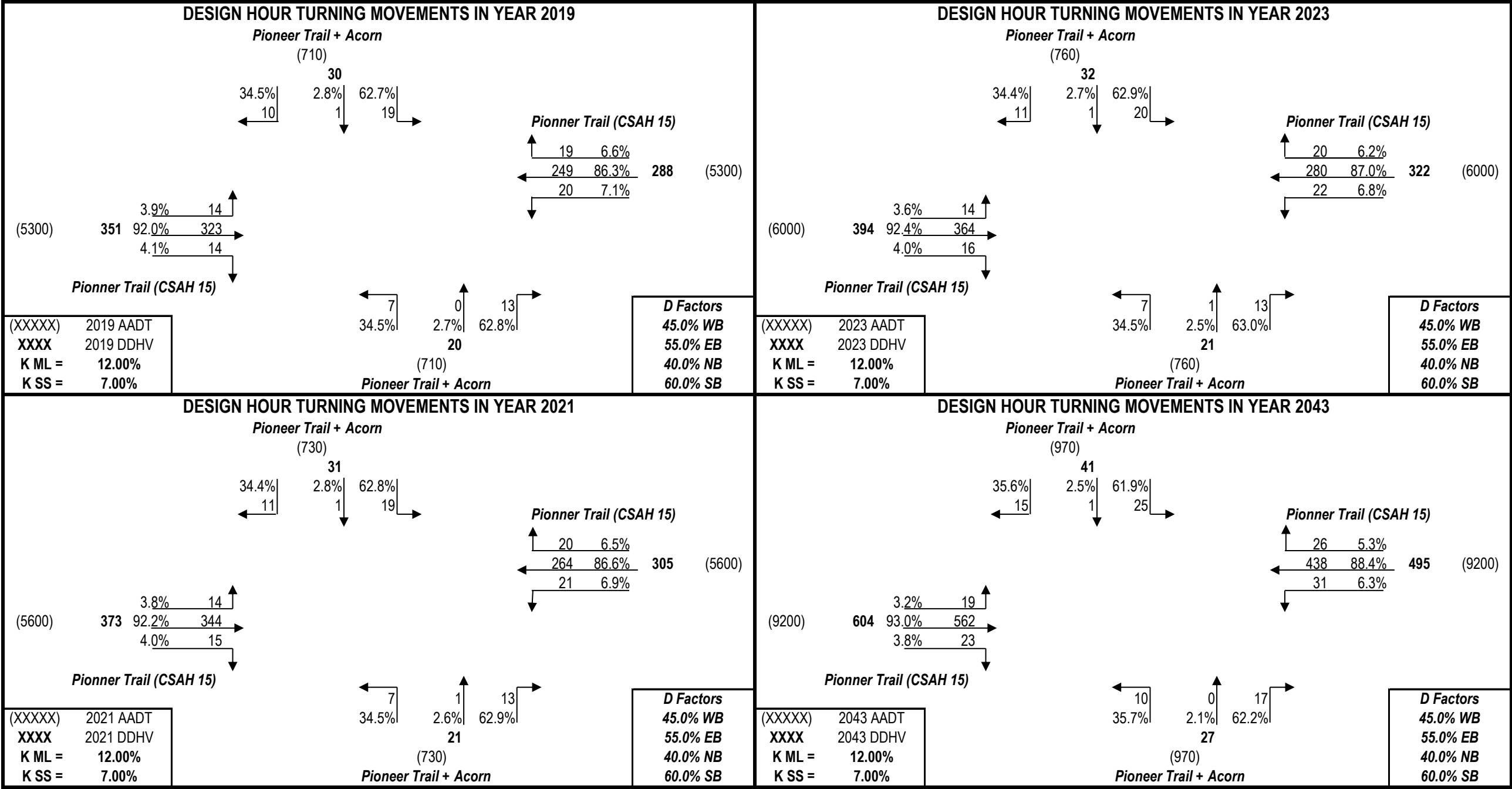
Carver County GIS, Ayres 2019

Appendix E: Hourly Traffic Volume Counts

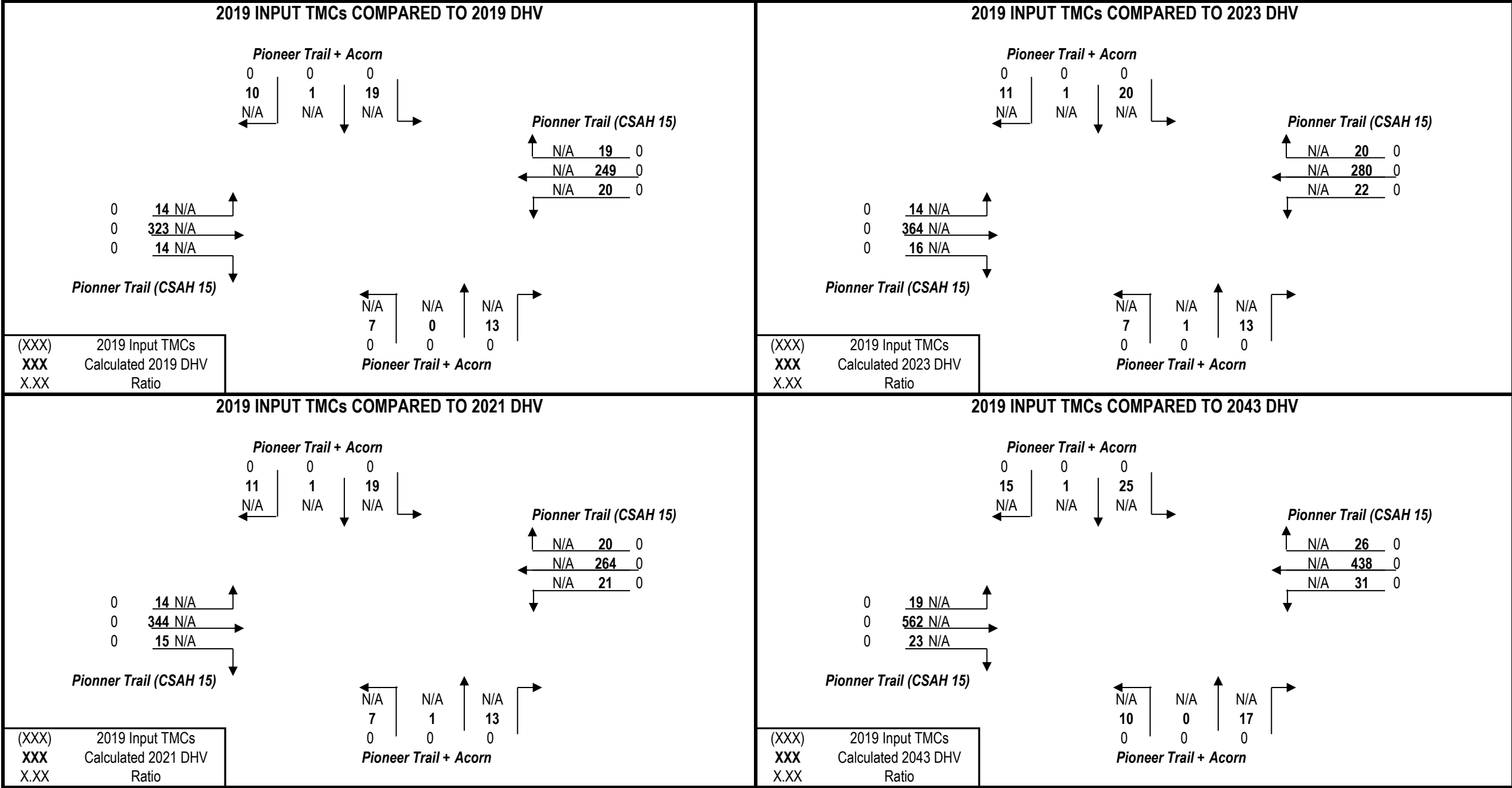
Intersection:	Ironwood Blvd. + Butternut Dr.	Acorn Rd. + Autumn Woods Dr.	Audubon Rd. (CSAH 15) + Autumn Woods Dr.	Audubon (CSAH 15) + Butternut Dr.	Ironwood Blvd. + Autumn Woods Dr.
Interval Start	Total Veh. Volumes (per each intersection)				
6:00	1	0	66	65	0
6:15	1	1	71	77	1
6:30	0	2	90	90	2
6:45	3	8	173	175	8
7:00	7	7	127	125	6
7:15	5	10	199	211	5
7:30	7	26	242	274	14
7:45	5	16	208	212	7
8:00	13	22	193	201	19
8:15	12	19	197	300	18
8:30	12	13	151	171	12
8:45	8	5	122	132	5
9:00	8	22	105	112	16
9:15	6	14	98	102	8
9:30	6	22	92	113	11
9:45	6	8	114	123	2
14:30	8	19	211	220	12
14:45	6	24	178	191	15
15:00	6	29	268	276	19
15:15	10	24	199	205	18
15:30	9	16	337	383	11
15:45	10	13	221	260	13
16:00	10	24	286	321	17
16:15	7	29	238	252	21
16:30	10	23	227	251	14
16:45	2	22	216	241	19
17:00	8	20	255	289	17
17:15	12	17	215	226	12
17:30	7	22	312	187	11
17:45	8	15	144	194	13
18:00	12	24	162	179	6
18:15	8	16	99	120	11

Appendix F: Turning Movement Assignments for Intersection 8

PROJECT TRAFFIC FOR Pionner Trail (CSAH 15) AT Pioneer Trail + Acorn



PROJECT TRAFFIC FOR Pionner Trail (CSAH 15) AT Pioneer Trail + Acorn



Appendix G: Existing (2021) Synchro Analysis Worksheets

Intersection

Int Delay, s/veh 0.5

Movement EBL EBR NBL NBT SBT SBRLane Configurations 

Traffic Vol, veh/h 7 3 4 355 705 8

Future Vol, veh/h 7 3 4 355 705 8

Conflicting Peds, #/hr 0 0 0 0 0 0

Sign Control Stop Stop Free Free Free Free

RT Channelized - None - None - None

Storage Length 0 - - - - 195

Veh in Median Storage, # 0 - - 0 0 -

Grade, % 0 - - 0 0 -

Peak Hour Factor 58 25 50 91 77 67

Heavy Vehicles, % 14 0 25 2 1 0

Mvmt Flow 12 12 8 390 916 12

Major/Minor Minor2 Major1 Major2

Conflicting Flow All 1322 916 928 0 - 0

Stage 1 916 - - - - -

Stage 2 406 - - - - -

Critical Hdwy 6.54 6.2 4.35 - - -

Critical Hdwy Stg 1 5.54 - - - - -

Critical Hdwy Stg 2 5.54 - - - - -

Follow-up Hdwy 3.626 3.3 2.425 - - -

Pot Cap-1 Maneuver 163 333 651 - - -

Stage 1 371 - - - - -

Stage 2 648 - - - - -

Platoon blocked, % - - -

Mov Cap-1 Maneuver 160 333 651 - - -

Mov Cap-2 Maneuver 160 - - - - -

Stage 1 365 - - - - -

Stage 2 648 - - - - -

Approach EB NB SB

HCM Control Delay, s 23.7 0.2 0

HCM LOS C

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h) 651 - 216 - -

HCM Lane V/C Ratio 0.012 - 0.111 - -

HCM Control Delay (s) 10.6 0 23.7 - -

HCM Lane LOS B A C - -

HCM 95th %tile Q(veh) 0 - 0.4 - -

Intersection						
Int Delay, s/veh	2.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	3	13	15	3	17
Future Vol, veh/h	11	3	13	15	3	17
Conflicting Peds, #/hr	6	0	0	6	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	69	75	81	63	75	71
Heavy Vehicles, %	0	100	20	31	100	36
Mvmt Flow	16	4	16	24	4	24
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	72	34	0	0	46	0
Stage 1	34	-	-	-	-	-
Stage 2	38	-	-	-	-	-
Critical Hdwy	6.4	7.2	-	-	5.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	4.2	-	-	3.1	-
Pot Cap-1 Maneuver	937	817	-	-	1110	-
Stage 1	994	-	-	-	-	-
Stage 2	990	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	920	812	-	-	1103	-
Mov Cap-2 Maneuver	920	-	-	-	-	-
Stage 1	987	-	-	-	-	-
Stage 2	979	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.1	0		1.2		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	- 896		1103	-	
HCM Lane V/C Ratio	-	- 0.022		0.004	-	
HCM Control Delay (s)	-	- 9.1		8.3	0	
HCM Lane LOS	-	- A		A	A	
HCM 95th %tile Q(veh)	-	- 0.1		0	-	

Lanes, Volumes, Timings

2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

06/29/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	0	6	45	0	143	12	208	45	231	514	8
Future Volume (vph)	4	0	6	45	0	143	12	208	45	231	514	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	15	8	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	130		130	242		242	230		230
Storage Lanes	0		0	1		1	1		1	1		1
Taper Length (ft)	25			68			90			68		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99				0.98						
Frt		0.923				0.850			0.850			0.850
Flt Protected		0.979		0.950			0.950			0.950		
Satd. Flow (prot)	0	1700	0	1656	1900	1599	1543	1845	1509	1752	1881	1615
Flt Permitted		0.861		0.739			0.340			0.579		
Satd. Flow (perm)	0	1495	0	1288	1900	1565	552	1845	1509	1068	1881	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22				400			71			47
Link Speed (mph)		25			25			50			50	
Link Distance (ft)		495			305			1151			1689	
Travel Time (s)		13.5			8.3			15.7			23.0	
Confl. Peds. (#/hr)						1						
Confl. Bikes (#/hr)			2									
Peak Hour Factor	0.33	1.00	0.38	0.75	1.00	0.78	0.50	0.70	0.63	0.79	0.78	0.50
Heavy Vehicles (%)	0%	0%	17%	9%	0%	1%	17%	3%	7%	3%	1%	0%
Adj. Flow (vph)	12	0	16	60	0	183	24	297	71	292	659	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	28	0	60	0	183	24	297	71	292	659	16
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			20			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		8			8			8			8	
Two way Left Turn Lane												
Headway Factor	1.20	0.88	1.20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left						Left	Thru			Thru	Right
Leading Detector (ft)	20	156		6	156	6	20	100	6	6	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		6	6	6	20	6	6	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		150			150			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	

2021 Existing 2021 Existing 3:30 pm 06/04/2021 Baseline

Synchro 11 Report
Page 2

Lanes, Volumes, Timings

2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

06/29/2021

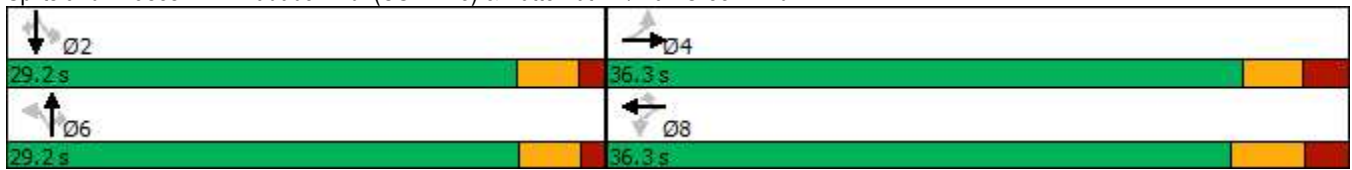
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm		Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			6			2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	6	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	12.0	12.0	12.0	12.0	12.0	12.0
Minimum Split (s)	36.3	36.3		35.8	35.8	35.8	29.2	29.2	29.2	28.3	28.3	28.3
Total Split (s)	36.3	36.3		36.3	36.3	36.3	29.2	29.2	29.2	29.2	29.2	29.2
Total Split (%)	55.4%	55.4%		55.4%	55.4%	55.4%	44.6%	44.6%	44.6%	44.6%	44.6%	44.6%
Yellow Time (s)	3.0	3.0		3.6	3.6	3.6	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.3	2.3		2.2	2.2	2.2	1.2	1.2	1.2	1.3	1.3	1.3
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.3		5.8	5.8	5.8	4.2	4.2	4.2	4.3	4.3	4.3
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)		7.8		7.4		7.4	29.1	29.1	29.1	29.0	29.0	29.0
Actuated g/C Ratio		0.18		0.17		0.17	0.67	0.67	0.67	0.67	0.67	0.67
v/c Ratio		0.10		0.27		0.30	0.06	0.24	0.07	0.41	0.52	0.01
Control Delay		9.3		18.7		1.3	4.6	4.8	1.6	7.2	7.2	0.6
Queue Delay		0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		9.3		18.7		1.3	4.6	4.8	1.6	7.2	7.2	0.6
LOS		A		B		A	A	A	A	A	A	A
Approach Delay		9.3			5.6			4.2			7.1	
Approach LOS		A			A			A			A	
Queue Length 50th (ft)		1		13		0	2	27	0	31	79	0
Queue Length 95th (ft)		15		30		0	5	44	5	65	128	0
Internal Link Dist (ft)		415			225			1071			1609	
Turn Bay Length (ft)				130		130	242		242	230		230
Base Capacity (vph)		1079		909		1223	372	1243	1039	717	1263	1100
Starvation Cap Reductn		0		0		0	0	0	0	0	0	0
Spillback Cap Reductn		0		0		0	0	0	0	0	0	0
Storage Cap Reductn		0		0		0	0	0	0	0	0	0
Reduced v/c Ratio		0.03		0.07		0.15	0.06	0.24	0.07	0.41	0.52	0.01
Intersection Summary												
Area Type:	Other											
Cycle Length: 65.5												
Actuated Cycle Length: 43.2												
Natural Cycle: 70												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.52												
Intersection Signal Delay: 6.2				Intersection LOS: A								
Intersection Capacity Utilization 55.4%				ICU Level of Service B								
Analysis Period (min) 15												

Lanes, Volumes, Timings

2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

06/29/2021

Splits and Phases: 2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.



Lanes, Volumes, Timings
7: Acorn Rd. & Pioneer Trail (Co. Rd. 14)

06/29/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	344	15	21	264	20	7	1	13	19	1	11
Future Volume (vph)	14	344	15	21	264	20	7	1	13	19	1	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	16	12	12	14	12
Storage Length (ft)	180		230	275		275	0		0	0		0
Storage Lanes	1		1	1		1	0		1	0		0
Taper Length (ft)	40			85			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.952	
Flt Protected	0.950			0.950				0.957			0.970	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	0	2020	1583	0	1835	0
Flt Permitted	0.548			0.438				0.886			0.886	
Satd. Flow (perm)	1021	1863	1583	816	1863	1583	0	1870	1583	0	1676	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			51			51			51		12	
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		611			533			150			1082	
Travel Time (s)		9.3			8.1			4.1			29.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	15	374	16	23	287	22	8	1	14	21	1	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	15	374	16	23	287	22	0	9	14	0	34	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.92	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	0	2	1	0	1	
Detector Template							Thru			Thru		
Leading Detector (ft)	6	156	6	6	156	6	50	156	6	50	6	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	6	6	6	6	6	6	0	6	6	0	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		150			150			150				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		6			2			4			8	

2021 Existing 2021 Existing 3:30 pm 06/04/2021 Baseline

Synchro 11 Report
Page 8

Lanes, Volumes, Timings
7: Acorn Rd. & Pioneer Trail (Co. Rd. 14)

06/29/2021

	↖	→	↗	↖	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	6		6	2		2	4		4	8		
Detector Phase	6	6	6	2	2	2	4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	8.0	8.0	5.0	5.0	
Minimum Split (s)	25.8	25.8	25.8	30.1	30.1	30.1	34.5	34.5	34.5	24.1	24.1	
Total Split (s)	31.6	31.6	31.6	31.6	31.6	31.6	34.5	34.5	34.5	34.4	34.4	
Total Split (%)	47.8%	47.8%	47.8%	47.8%	47.8%	47.8%	52.2%	52.2%	52.2%	52.0%	52.0%	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.3	1.3	1.3	1.6	1.6	1.6	2.0	2.0	2.0	2.6	2.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Lost Time (s)	5.8	5.8	5.8	6.1	6.1	6.1		5.5	5.5		6.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max	
Act Effect Green (s)	25.8	25.8	25.8	25.5	25.5	25.5		29.0	29.0		28.4	
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.39	0.39		0.44	0.44		0.43	
v/c Ratio	0.04	0.51	0.02	0.07	0.40	0.03		0.01	0.02		0.05	
Control Delay	12.9	18.5	0.4	13.7	16.8	1.6		10.6	0.1		8.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	12.9	18.5	0.4	13.7	16.8	1.6		10.6	0.1		8.5	
LOS	B	B	A	B	B	A		B	A		A	
Approach Delay		17.6			15.6			4.2			8.5	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)	4	112	0	6	81	0		2	0		5	
Queue Length 95th (ft)	14	185	2	19	140	5		9	1		19	
Internal Link Dist (ft)		531			453			70			1002	
Turn Bay Length (ft)	180		230	275		275						
Base Capacity (vph)	398	727	648	314	718	642		820	723		726	
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	
Reduced v/c Ratio	0.04	0.51	0.02	0.07	0.40	0.03		0.01	0.02		0.05	

Intersection Summary

Area Type: Other

Cycle Length: 66.1

Actuated Cycle Length: 66.1

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.51

Intersection Signal Delay: 16.0

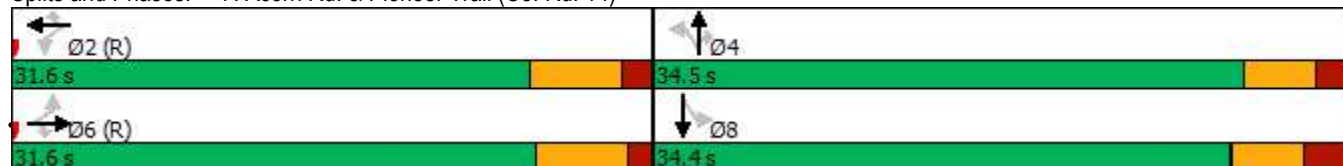
Intersection LOS: B

Intersection Capacity Utilization 54.5%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 7: Acorn Rd. & Pioneer Trail (Co. Rd. 14)



Lanes, Volumes, Timings
3: Ironwood Blvd. & Butternut Dr.

06/29/2021

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	18	0	1	17	0	0
Future Volume (vph)	18	0	1	17	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	8	14	8	8	14
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.884					
Flt Protected	0.950					
Satd. Flow (prot)	1735	0	1704	0	0	2027
Flt Permitted	0.950					
Satd. Flow (perm)	1735	0	1704	0	0	2027
Link Speed (mph)	25	25		25		
Link Distance (ft)	495	372		154		
Travel Time (s)	13.5	10.1		4.2		
Confl. Peds. (#/hr)	2	5				
Peak Hour Factor	0.75	1.00	0.25	0.71	1.00	1.00
Heavy Vehicles (%)	11%	0%	0%	6%	0%	0%
Adj. Flow (vph)	24	0	4	24	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	24	0	28	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	14	0		0		
Link Offset(ft)	0	0		0		
Crosswalk Width(ft)	16	16		16		
Two way Left Turn Lane						
Headway Factor	0.92	1.20	0.92	1.20	1.20	0.92
Turning Speed (mph)	15	9	9		15	
Sign Control	Free	Yield		Yield		
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	14.9%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection	
Intersection Delay, s/veh	6.9
Intersection LOS	A

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	4	26	6	6	23	17
Future Vol, veh/h	4	26	6	6	23	17
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	0	0	0	0	4	6
Mvmt Flow	4	26	6	6	23	17
Number of Lanes	1	0	0	1	1	0

Approach	SE	NW	NE
Opposing Approach	NW	SE	
Opposing Lanes	1	1	0
Conflicting Approach Left		NE	SE
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NE		NW
Conflicting Lanes Right	1	0	1
HCM Control Delay	6.6	7.2	7.1
HCM LOS	A	A	A

Lane	NELn1	NWLn1	SELn1
Vol Left, %	57%	50%	0%
Vol Thru, %	0%	50%	13%
Vol Right, %	42%	0%	87%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	40	12	30
LT Vol	23	6	0
Through Vol	0	6	4
RT Vol	17	0	26
Lane Flow Rate	40	12	30
Geometry Grp	1	1	1
Degree of Util (X)	0.043	0.014	0.029
Departure Headway (Hd)	3.902	4.094	3.46
Convergence, Y/N	Yes	Yes	Yes
Cap	921	876	1036
Service Time	1.912	2.11	1.476
HCM Lane V/C Ratio	0.043	0.014	0.029
HCM Control Delay	7.1	7.2	6.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0	0.1

Appendix H: Traffic Distribution



TRIP DISTRIBUTION SCENARIO 1 EXITING

0 250 500
SCALE: 1" = 500 FEET



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Architecture + Engineering + Environmental + Planning

9.B. Adopt Resolution 2021-67 and...

Packet Page 208 of...

RESERVE AT AUTUMN WOODS

CHASKA, MN - 06/30/2021

ISG PROJECT NO. 21-24984

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CAD FILE NAME: 24984 TRIP DISTRIBUTION EX-18181



TRIP DISTRIBUTION SCENARIO 1 ENTERING

0 250 500
SCALE: 1" = 500 FEET





TRIP DISTRIBUTION SCENARIO 2 EXITING

0 250 500
SCALE: 1" = 500 FEET



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CAD FILE NAME: 24384 TRIP DISTRIBUTION EX-18175

RESERVE AT AUTUMN WOODS

CHASKA, MN - 06/30/2021

ISG PROJECT NO. 21-24984



TRIP DISTRIBUTION SCENARIO 2 ENTERING

0 250 500
SCALE: 1" = 500 FEET



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RESERVE AT AUTUMN WOODS

CHASKA, MN - 06/30/2021

ISG PROJECT NO. 21-24984

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CAD FILE NAME: 24984 TRIP DISTRIBUTION EX-18175



TRIP DISTRIBUTION SCENARIO 3 ENTERING (2023)

0 250 500
SCALE: 1" = 500 FEET



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RESERVE AT AUTUMN WOODS

CHASKA, MN - 06/30/2021

ISG PROJECT NO. 21-24984

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CAD FILE NAME: 24984 TRIP DISTRIBUTION EX-18175



TRIP DISTRIBUTION SCENARIO 3 EXITING (2023)

0 250 500
SCALE: 1" = 500 FEET



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CAD FILE NAME: 24384 TRIP DISTRIBUTION EX-18175

RESERVE AT AUTUMN WOODS

CHASKA, MN - 06/30/2021

ISG PROJECT NO. 21-24984



TRIP DISTRIBUTION SCENARIO 3 ENTERING (2043)

0 250 500
SCALE: 1" = 500 FEET



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Packet Page 214 of...

RESERVE AT AUTUMN WOODS

CHASKA, MN - 08/11/2021

ISG PROJECT NO. 21-24984

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CAD FILE NAME: 24984 SENSITIVITY STUDY EXHIBITS



TRIP DISTRIBUTION SCENARIO 3 EXITING (2043)

0 250 500
SCALE: 1" = 500 FEET



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9.B. Adopt Resolution 2021-67 and...

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CAD FILE NAME: 24984 SENSITIVITY STUDY EXHIBITS

RESERVE AT AUTUMN WOODS

CHASKA, MN - 08/11/2021

ISG PROJECT NO. 21-24984

Appendix I: Intersection 1 Warrant Analysis

Multi-Way Stop Application

OMUTCD Section 2B.07

- A. Where traffic control signals are justified, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal. Warranted ?
No
- B. Five or more reported crashes in a 12-month period that are susceptible to correction by a multiway stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions.
- C. Minimum Volumes:
- 1 The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day. Yes
 - 2 The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour.* No
*If this condition is satisfied, there must also be an average delay of at least 30 seconds per vehicle during the peak hour.
 - 3 If the 85th-percentile approach speed of the major-street traffic exceeds 40 mph, the minimum volume warrants are 70 percent of the values provided in Items 1 and 2. Yes
- D. Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition. No
- Other criteria that may be considered in an engineering study include:
- A. The need to control left-turn conflicts; No
 - B. The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes; No
 - C. Locations where a road user, after stopping, cannot see conflicting traffic and is not able to negotiate the intersection unless conflicting cross traffic is also required to stop; and No
 - D. An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where multi-way stop control would improve traffic operational characteristics of the intersection. No

Are the requirements for Multi-Way Stop Satisfied?: No

Lanes	ADJUSTED VOLUMES		Condition C.1		Condition C.2		Condition D	
Major/								
Minor	MAJOR	MINOR	100%		70%		80%	
			MAJ.	MIN.	MAJ.	MIN.	MAJ.	MIN.
Required Volumes			300	200	210	140	240	160
6:00 AM	397	8	1				1	
6:15 AM	455	11						
6:30 AM	579	15						
6:45 AM	726	20			1			
7:00 AM	758	22	1				1	
7:15 AM	818	28						
7:30 AM	810	34						
7:45 AM	717	36			1			
8:00 AM	632	32	1				1	
8:15 AM	544	32						
8:30 AM	449	28						
8:45 AM	392	26			1			
9:00 AM	384	27	1				1	
9:15 AM	289	17						
9:30 AM	197	11						
9:45 AM	111	5						
10:00 AM	381	23	1		1		1	
10:15 AM	381	23						
10:30 AM	381	23						
10:45 AM	381	23						
11:00 AM	349	19	1		1		1	
11:15 AM	349	19						
11:30 AM	349	19						
11:45 AM	349	19						
12:00 PM	405	15	1		1		1	
12:15 PM	405	15						
12:30 PM	405	15						
12:45 PM	405	15						
1:00 PM	414	13	1		1		1	
1:15 PM	485	17						
1:30 PM	556	19						
1:45 PM	760	26						
2:00 PM	517	26	1		1		1	
2:15 PM	713	23						
2:30 PM	837	25						
2:45 PM	964	24						
3:00 PM	1012	17	1		1		1	
3:15 PM	994	22						
3:30 PM	1008	24						
3:45 PM	986	22						
4:00 PM	907	23	1		1		1	
4:15 PM	658	17						
4:30 PM	449	11						
4:45 PM	140	7						
5:00 PM	0	0						
5:15 PM	0	0						
5:30 PM	0	0						
5:45 PM	0	0						
6:00 PM	0	0						
6:15 PM	0	0						
6:30 PM	0	0						
6:45 PM	0	0						
7:00 PM	0	0						
7:15 PM	0	0						
7:30 PM	0	0						
7:45 PM	0	0						
8:00 PM	0	0						
HOURS MET			11	0	11	0	11	0

WARRANT SATISFIED?	NO	NO	NO
---------------------------	-----------	-----------	-----------

OMUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	2 or More Lanes
Minor Street:	1 Lane

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? **Yes**

**Only applicable after an adequate trial of other alternatives (See section 4C.02.06 of the 2012 OMUTCD)*

Lanes Major/ Minor	Adjusted Volumes		Condition A				Condition B				Combination A/B*							
			100%		70%		100%		70%		Cond. A		Cond. B		Cond. A		Cond. B	
	Major	Minor	Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.
1 / 1			500	150	350	105	750	75	525	53	400	120	600	60	280	84	420	42
2+ / 1	X		600	150	420	105	900	75	630	53	480	120	720	60	336	84	504	42
2+ / 2+			600	200	420	140	900	100	630	70	480	160	720	80	336	112	504	56
1 / 2+			500	200	350	140	750	100	525	70	400	160	600	80	280	112	420	56
12:00 AM	0	0																
12:15 AM	0	0																
12:30 AM	0	0																
12:45 AM	0	0																
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4:00 AM	0	0																
4:15 AM	0	0																
4:30 AM	0	0																
4:45 AM	0	0																
5:00 AM	0	0																
5:15 AM	65	1																
5:30 AM	136	1																
5:45 AM	225	2																
6:00 AM	397	3													1			
6:15 AM	455	6			1													
6:30 AM	579	10									1						1	
6:45 AM	726	15	1						1				1					
7:00 AM	758	18													1			
7:15 AM	818	24			1													
7:30 AM	810	30									1						1	
7:45 AM	717	32	1						1									
8:00 AM	632	31													1			
8:15 AM	544	31			1													
8:30 AM	449	27																
8:45 AM	392	25																

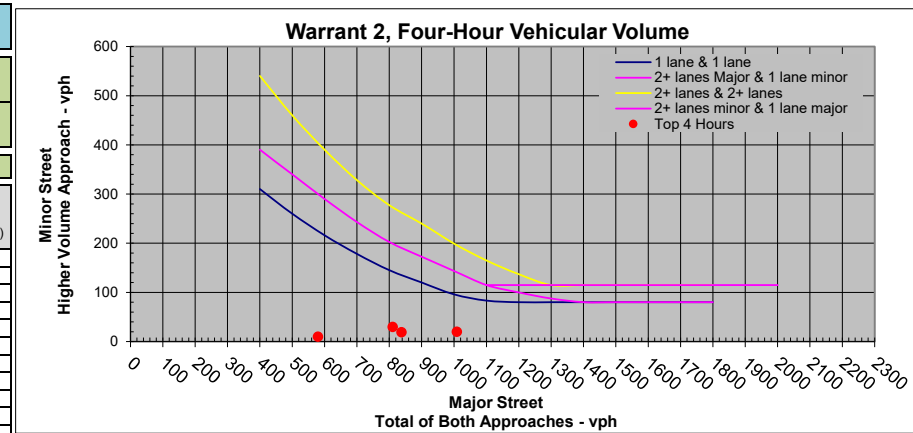
ODOT Traffic Signal Warrant Spreadsheet-Intersection 1.xlsx

9:00 AM	384	25													1			
9:15 AM	289	15																
9:30 AM	197	9																
9:45 AM	111	3																
10:00 AM	381	23													1			
10:15 AM	381	23																
10:30 AM	381	23																
10:45 AM	381	23																
11:00 AM	349	19													1			
11:15 AM	349	19																
11:30 AM	349	19																
11:45 AM	349	19																
12:00 PM	405	15													1			
12:15 PM	405	15																
12:30 PM	405	15																
12:45 PM	405	15																
1:00 PM	414	13													1			
1:15 PM	485	17			1					1								
1:30 PM	556	19															1	
1:45 PM	760	26	1						1				1					
2:00 PM	517	20													1			
2:15 PM	713	17			1						1							
2:30 PM	837	19															1	
2:45 PM	964	18	1				1		1				1					
3:00 PM	1012	13													1			
3:15 PM	994	18			1						1							
3:30 PM	1008	20															1	
3:45 PM	986	18	1				1		1				1					
4:00 PM	907	20													1			
4:15 PM	658	14			1						1							
4:30 PM	449	8																
4:45 PM	140	4																
5:00 PM	0	0																
5:15 PM	0	0																
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9:00 PM	0	0																
9:15 PM	0	0																
9:30 PM	0	0																
9:45 PM	0	0																
HOURS MET			5	0	7	0	2	0	5	0	6	0	4	0	11	0	5	0
WARRANT SATISFIED?			NO		NO		NO		NO		NO		NO		NO		NO	

Warrant Met: **No**

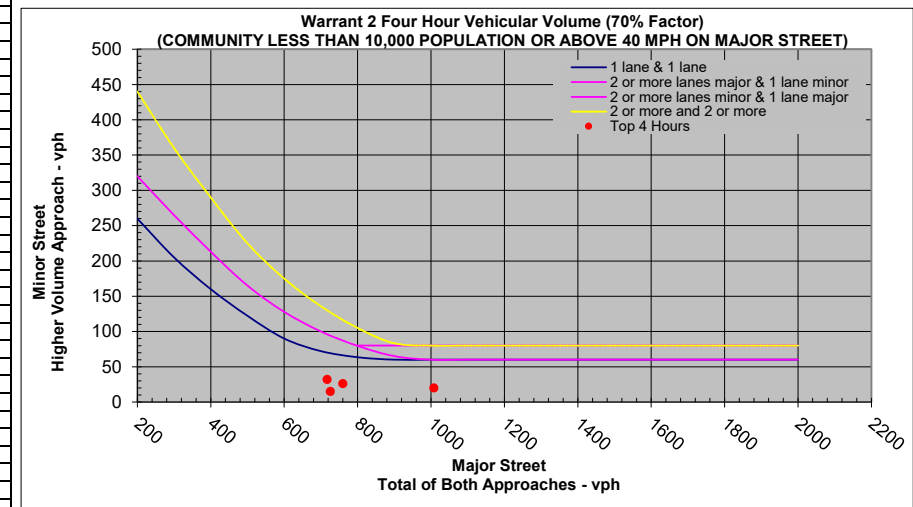
Notes:

OMUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME								
Number of Lanes for Moving Traffic on Each Approach			Total Number of Unique Hours Met on Figure 4C-1					0
Major street: 2 or More Lanes			Total Number of Unique Hours Met on Figure 4C-2 (70% Factor)					0
Minor Street: 1 Lane								
Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street?								Yes
Hour Interval Beginning At	Raw Traffic Counts				Total Major Approach Volumes	Highest Actual Minor Street Approach Volumes	Hour Met?	Hour Met? (70% Factor)
	Major - Audubon Road (CSAH 15)		Minor - Autumn Woods Drive					
	N-Bound	S-Bound	W-Bound	E-Bound				
6:00 AM	287	110	0	3	397	3		
6:15 AM	345	110	0	6	455	6		
6:30 AM	452	127	0	10	579	10		
6:45 AM	554	172	0	15	726	15		
7:00 AM	546	212	0	18	758	18		
7:15 AM	563	255	0	24	818	24		
7:30 AM	512	298	0	30	810	30		
7:45 AM	417	300	0	32	717	32		
8:00 AM	366	266	0	31	632	31		
8:15 AM	318	226	0	31	544	31		
8:30 AM	276	173	0	27	449	27		
8:45 AM	250	142	0	25	392	25		
9:00 AM	234	150	0	25	384	25		
9:15 AM	172	117	0	15	289	15		
9:30 AM	117	80	0	9	197	9		
9:45 AM	66	45	0	3	111	3		
10:00 AM	245	136	0	23	381	23		
10:15 AM	245	136	0	23	381	23		
10:30 AM	245	136	0	23	381	23		
10:45 AM	245	136	0	23	381	23		
11:00 AM	225	124	0	19	349	19		
11:15 AM	225	124	0	19	349	19		
11:30 AM	225	124	0	19	349	19		
11:45 AM	225	124	0	19	349	19		
12:00 PM	266	139	0	15	405	15		
12:15 PM	266	139	0	15	405	15		
12:30 PM	266	139	0	15	405	15		
12:45 PM	266	139	0	15	405	15		
1:00 PM	264	150	0	13	414	13		
1:15 PM	334	151	0	17	485	17		
1:30 PM	404	152	0	19	556	19		
1:45 PM	477	283	0	26	760	26		
2:00 PM	287	230	0	20	517	20		
2:15 PM	280	433	0	17	713	17		
2:30 PM	287	550	0	19	837	19		
2:45 PM	313	651	0	18	964	18		
3:00 PM	334	678	0	13	1012	13		
3:15 PM	348	646	0	18	994	18		
3:30 PM	351	657	0	20	1008	20		
3:45 PM	312	674	0	18	986	18		
4:00 PM	275	632	0	20	907	20		
4:15 PM	198	460	0	14	658	14		
4:30 PM	118	331	0	8	449	8		
4:45 PM	58	82	0	4	140	4		
5:00 PM	0	0	0	0	0	0		
5:15 PM	0	0	0	0	0	0		
5:30 PM	0	0	0	0	0	0		
5:45 PM	0	0	0	0	0	0		
6:00 PM	0	0	0	0	0	0		
6:15 PM	0	0	0	0	0	0		
6:30 PM	0	0	0	0	0	0		
6:45 PM	0	0	0	0	0	0		
7:00 PM	0	0	0	0	0	0		
7:15 PM	0	0	0	0	0	0		
7:30 PM	0	0	0	0	0	0		
7:45 PM	0	0	0	0	0	0		
8:00 PM	0	0	0	0	0	0		



Top Hours for Figure 4C-1	Start Time	End Time	Major Street	Minor Street
Top Hour	3:30 PM	4:30 PM	1008	20
2nd Highest Hour	2:30 PM	3:30 PM	837	19
3rd Highest Hour	7:30 AM	8:30 AM	810	30
4th Highest Hour	6:30 AM	7:30 AM	579	10

Top Hours for Figure 4C-2	Start Time	End Time	Major Street	Minor Street
Top Hour	7:45 AM	8:45 AM	717	32
2nd Highest Hour	1:45 PM	2:45 PM	760	26
3rd Highest Hour	3:30 PM	4:30 PM	1008	20
4th Highest Hour	6:45 AM	7:45 AM	726	15



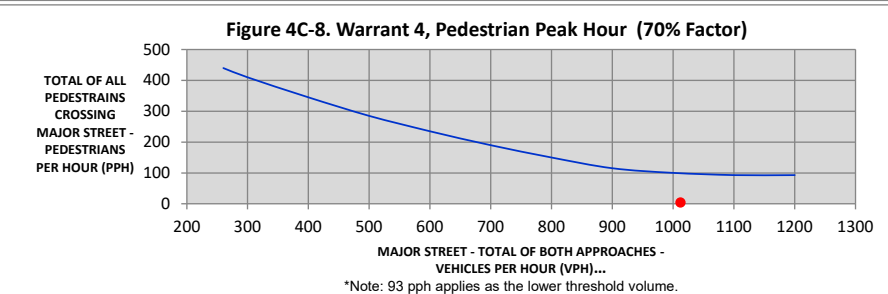
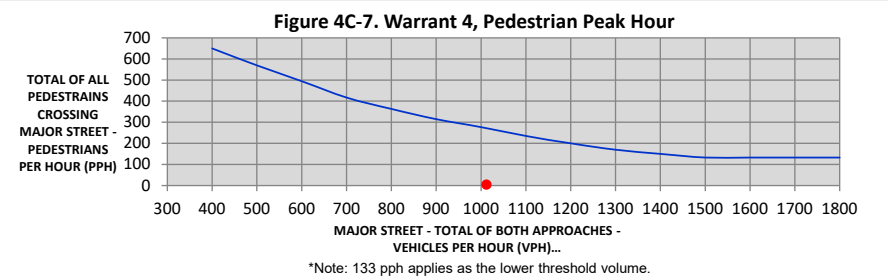
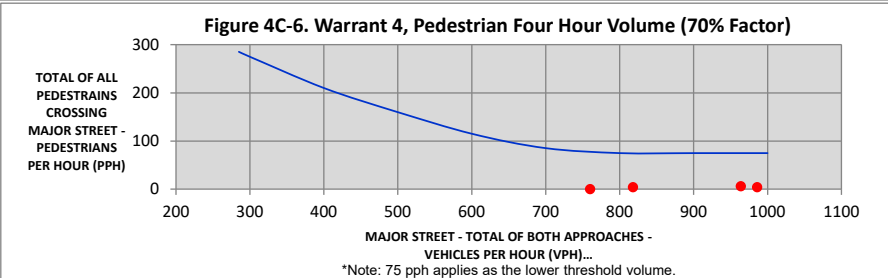
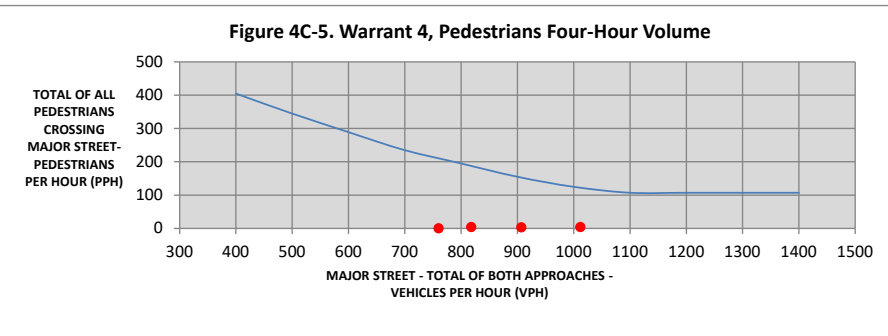
Are the requirements for Warrant 2 met?: **No**

OMUTCD WARRANT 3, PEAK HOUR				Hour Vehicular Volume					Actual Peak Hour Major Traffic Volume	Actual Peak Hour Minor Traffic Volume	Required Peak Hour Minor Traffic Volume for Fig. 4C-3	Required Peak Hour Minor Traffic Volume for Fig. 4C-4
Number of Lanes for Moving Traffic on Each Approach	Peak Hour Start time	3:30 PM	Hour Interval Beginning At	Major Street Combined Vehicles Per Hour (VPH)	Highest Minor Street Approach Vehicles Per Hour (VPH)	Sum of Major Street and Highest Minor Street	Sum of Major Street and Combined Minor Street					
Major Street: 2 or More Lanes	Peak Hour End Time	4:30 PM	6:00 AM	397	3	400	400	1008	20	289.04422	99.129549	
Minor Street: 1 Lane			6:15 AM	455	6	461	461					
Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street?			Yes	6:30 AM	579	10	589					
Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time?			No	6:45 AM	726	15	741					
Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present*				7:00 AM	758	18	776					
Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach?	Yes		7:15 AM	818	24	842	842					
Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?	No		7:30 AM	810	30	840	840					
Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?	Yes		7:45 AM	717	32	749	749					
*If applicable, attach all supporting calculations and documentation.				8:00 AM	632	31	663					
Are the requirements for Warrant 3 met?:			No	8:15 AM	544	31	575					
				8:30 AM	449	27	476					
				8:45 AM	392	25	417					
				9:00 AM	384	25	409					
				9:15 AM	289	15	304					
				9:30 AM	197	9	206					
				9:45 AM	111	3	114					
				10:00 AM	381	23	404					
				10:15 AM	381	23	404					
				10:30 AM	381	23	404					
				10:45 AM	381	23	404					
				11:00 AM	349	19	368					
				11:15 AM	349	19	368					
				11:30 AM	349	19	368					
				11:45 AM	349	19	368					
				12:00 PM	405	15	420					
				12:15 PM	405	15	420					
				12:30 PM	405	15	420					
				12:45 PM	405	15	420					
				1:00 PM	414	13	427					
				1:15 PM	485	17	502					
				1:30 PM	556	19	575					
				1:45 PM	760	26	786					
				2:00 PM	517	20	537					
				2:15 PM	713	17	730					
				2:30 PM	837	19	856					
				2:45 PM	964	18	982					
				3:00 PM	1012	13	1025					
				3:15 PM	994	18	1012					
				3:30 PM	1008	20	1028					
				3:45 PM	986	18	1004					
				4:00 PM	907	20	927					
				4:15 PM	658	14	672					
				4:30 PM	449	8	457					
				4:45 PM	140	4	144					
				5:00 PM	0	0	0					
				5:15 PM	0	0	0					
				5:30 PM	0	0	0					
				5:45 PM	0	0	0					
				6:00 PM	0	0	0					
				6:15 PM	0	0	0					
				6:30 PM	0	0	0					
				6:45 PM	0	0	0					
				7:00 PM	0	0	0					
				7:15 PM	0	0	0					
				7:30 PM	0	0	0					
				7:45 PM	0	0	0					
				8:00 PM	0	0	0					

Figure 4C-3. Warrant 3 Peak Hour

**Warrant 3 Peak Hour (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)**

OMUTCD WARRANT 4, PEDESTRIAN VOLUME																													
Hour Interval Beginning At	Major Street Combined Vehicles Per Hour (VPH)	Total of All Pedestrians Crossing Major Street Pedestrians Per Hour (PPH)																											
6:00 AM	397	5	Built-up Isolated Community With Less Than 10,000 Population or Above 35 MPH on Major Street? Yes																										
6:15 AM	455	5																											
6:30 AM	579	5																											
6:45 AM	726	5																											
7:00 AM	758	4	15th Percentile Pedestrian Crossing Speed Less than 3.5 f/s? No <i>*If applicable, attach all supporting calculations, documentation, and findings.</i>																										
7:15 AM	818	4																											
7:30 AM	810	4																											
7:45 AM	717	4																											
8:00 AM	632	1	If 15th Percentile Pedestrian Crossing Speed is Less than 3.5 f/s, Reduce Criterion by (up to 50%): 0%																										
8:15 AM	544	1																											
8:30 AM	449	1																											
8:45 AM	392	1																											
9:00 AM	384	2	Is the distance to the nearest traffic control signal or STOP sign controlling the major street that pedestrians desire to cross less than 300 feet? No																										
9:15 AM	289	2																											
9:30 AM	197	2																											
9:45 AM	111	2																											
10:00 AM	381	0	If the distance to the nearest traffic control signal or STOP sign controlling the major street that pedestrians desire to cross is less than 300 feet, will the proposed traffic control signal restrict the progressive movement of traffic? If applicable, attach supporting justification. No																										
10:15 AM	381	0																											
10:30 AM	381	0																											
10:45 AM	381	0																											
11:00 AM	349	0	Does the intersection meet the 4-Hour Volume? No																										
11:15 AM	349	0																											
11:30 AM	349	0																											
11:45 AM	349	0																											
12:00 PM	405	0	Does the intersection meet the Peak Hour? No																										
12:15 PM	405	0																											
12:30 PM	405	0																											
12:45 PM	405	0																											
1:00 PM	414	0	Are the Requirements for Warrant 4 Satisfied? No																										
1:15 PM	485	0																											
1:30 PM	556	0																											
1:45 PM	760	0																											
2:00 PM	517	6	<table border="1"> <thead> <tr> <th>Top Hours for Figure 4C-5</th> <th>Start Time</th> <th>End Time</th> <th>Major Street</th> <th>Minor Street</th> </tr> </thead> <tbody> <tr> <td>Top Hour</td> <td>3:00 PM</td> <td>4:00 PM</td> <td>1012</td> <td>4</td> </tr> <tr> <td>2nd Highest Hour</td> <td>4:00 PM</td> <td>5:00 PM</td> <td>907</td> <td>3</td> </tr> <tr> <td>3rd Highest Hour</td> <td>7:15 AM</td> <td>8:15 AM</td> <td>818</td> <td>4</td> </tr> <tr> <td>4th Highest Hour</td> <td>1:45 PM</td> <td>2:45 PM</td> <td>760</td> <td>0</td> </tr> </tbody> </table>		Top Hours for Figure 4C-5	Start Time	End Time	Major Street	Minor Street	Top Hour	3:00 PM	4:00 PM	1012	4	2nd Highest Hour	4:00 PM	5:00 PM	907	3	3rd Highest Hour	7:15 AM	8:15 AM	818	4	4th Highest Hour	1:45 PM	2:45 PM	760	0
Top Hours for Figure 4C-5	Start Time	End Time			Major Street	Minor Street																							
Top Hour	3:00 PM	4:00 PM			1012	4																							
2nd Highest Hour	4:00 PM	5:00 PM			907	3																							
3rd Highest Hour	7:15 AM	8:15 AM	818	4																									
4th Highest Hour	1:45 PM	2:45 PM	760	0																									
2:15 PM	713	6	<table border="1"> <thead> <tr> <th>Top Hours for Figure 4C-6</th> <th>Start Time</th> <th>End Time</th> <th>Major Street</th> <th>Minor Street</th> </tr> </thead> <tbody> <tr> <td>Top Hour</td> <td>2:45 PM</td> <td>3:45 PM</td> <td>964</td> <td>6</td> </tr> <tr> <td>2nd Highest Hour</td> <td>3:45 PM</td> <td>4:45 PM</td> <td>986</td> <td>4</td> </tr> <tr> <td>3rd Highest Hour</td> <td>7:15 AM</td> <td>8:15 AM</td> <td>818</td> <td>4</td> </tr> <tr> <td>4th Highest Hour</td> <td>1:45 PM</td> <td>2:45 PM</td> <td>760</td> <td>0</td> </tr> </tbody> </table>		Top Hours for Figure 4C-6	Start Time	End Time	Major Street	Minor Street	Top Hour	2:45 PM	3:45 PM	964	6	2nd Highest Hour	3:45 PM	4:45 PM	986	4	3rd Highest Hour	7:15 AM	8:15 AM	818	4	4th Highest Hour	1:45 PM	2:45 PM	760	0
Top Hours for Figure 4C-6	Start Time	End Time			Major Street	Minor Street																							
Top Hour	2:45 PM	3:45 PM			964	6																							
2nd Highest Hour	3:45 PM	4:45 PM			986	4																							
3rd Highest Hour	7:15 AM	8:15 AM	818	4																									
4th Highest Hour	1:45 PM	2:45 PM	760	0																									
2:30 PM	837	6	<table border="1"> <thead> <tr> <th colspan="4">Peak Hour Used for Graphs 4C-7 & 4C-8</th> </tr> <tr> <th colspan="4">Top Hour</th> </tr> <tr> <th>Start Time</th> <th>End Time</th> <th>Major Street</th> <th>Minor Street</th> </tr> <tr> <td>3:00 PM</td> <td>4:00 PM</td> <td>1012</td> <td>4</td> </tr> </thead> <tbody> <tr> <td colspan="2">Number of Hours That Met the 4-Hour Criteria 4C-5</td> <td colspan="2">0</td> </tr> <tr> <td colspan="2">Number of Hours That Met the 4-Hour Criteria 4C-6</td> <td colspan="2">0</td> </tr> </tbody> </table>		Peak Hour Used for Graphs 4C-7 & 4C-8				Top Hour				Start Time	End Time	Major Street	Minor Street	3:00 PM	4:00 PM	1012	4	Number of Hours That Met the 4-Hour Criteria 4C-5		0		Number of Hours That Met the 4-Hour Criteria 4C-6		0		
Peak Hour Used for Graphs 4C-7 & 4C-8																													
Top Hour																													
Start Time	End Time	Major Street			Minor Street																								
3:00 PM	4:00 PM	1012	4																										
Number of Hours That Met the 4-Hour Criteria 4C-5		0																											
Number of Hours That Met the 4-Hour Criteria 4C-6		0																											
2:45 PM	964	6																											
3:00 PM	1012	4																											
3:15 PM	994	4																											
3:30 PM	1008	4																											
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4:30 PM	449	3																											
4:45 PM	140	3																											
5:00 PM	0	0																											
5:15 PM	0	0																											
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7:15 PM	0	0																											
7:30 PM	0	0																											
7:45 PM	0	0																											
8:00 PM	0	0																											



OMUTCD WARRANT 5, SCHOOL CROSSING

Do school children (elementary through high school students) cross the major street?

Has consideration been given to implement other remedial measures, such as warning signs and flashers, school speed zones, school crossing guards, or a grade-separated crossing?

Is the distance to the nearest traffic control signal along the major street less than 300 feet?

If the distance to the nearest traffic control signal along the major street is less than 300 feet, will the proposed traffic control signal restrict the progressive movement of traffic?

Minimum of 20 schoolchildren during the highest crossing hour?

Has a traffic engineering study been conducted to determine the adequacy and frequency of gaps in the vehicular traffic stream as related to the number and size of groups of school children at an established school crossing across the major street?

Pedestrian Gap Acceptance Engineering and Traffic Study Evaluation

Data Collection Date:

Day of the Week:

Study Period	Study Duration (min)	Crossing 1 (Stage 1)		Crossing 1 (Stage 2)		Crossing 2 (Stage 1)		Crossing 2 (Stage 2)	
		Total Adequate Gaps	Met?	Road A	Met?	Total Adequate Gaps	Met?	Total Adequate Gaps	Met?
1			N/A		N/A		N/A		N/A
2			N/A		N/A		N/A		N/A
3			N/A		N/A		N/A		N/A
4			N/A		N/A		N/A		N/A
5			N/A		N/A		N/A		N/A
Summary:		Not Met		Not Met		Not Met		Not Met	

Estimation of Expected Gaps if No Study was Done.

Crossing Width: feet
Required Gap time: sec.

Length of Time period for which the volume applies: Sec.

Two way vehicular volume across the crossing path over time period:

Expected number of gaps per the length of time which are equal to or greater than the required gap time

Are the requirements for Warrant 5 met?:

OMUTCD WARRANT 6, COORDINATED SIGNAL SYSTEM

On a one-way street or a street that has traffic predominantly in one direction, the adjacent traffic control signals are so far apart that they do not provide the necessary degree of vehicular platooning.

On a two-way street, adjacent traffic control signals do not provide the necessary degree of platooning and the proposed and adjacent traffic control signals will collectively provide a progressive operation.

**Warrant 6 should not be applied where the resultant spacing of traffic control signals would be less than 1,000 feet.*

Are the requirements for Warrant 6 met?:

OMUTCD WARRANT 7, CRASH EXPERIENCE

Built-up Isolated Community With Less Than 10,000 Population or Above 40 mph on Major Street?:

Number of Lanes for Moving Traffic on Each Approach

Major Street: 2 or More Lanes

Minor Street: 1 Lane

Has adequate trial of alternative with satisfactory observance and enforcement failed to reduce the crash frequency?

Five or more reportable and/ or non-reportable crashes, of types susceptible to correction by a traffic control signal have occurred within a 12-month period during the most recent 3 years of available crash data.*

**If applicable attach a summary of the crash data analysis used for this criterion*

For each of any 8 hours of an average day, the vehicles per hour given in both the 80% columns of Condition A in Table 4C-1 exists on the major-street and the higher-volume minor-street approach, respectively, to the intersection, if in a built-up isolated community with less than 10,000 population or above 40 mph on major street, the 56% columns may be used.

For each of any 8 hours of an average day, the vehicles per hour given in both the 80% columns of Condition B in Table 4C-1 exists on the major-street and the higher-volume minor-street approach, respectively, to the intersection, if in a built-up isolated community with less than 10,000 population or above 40 mph on major street, the 56% columns may be used.

The volume of pedestrian traffic is not less than 80% of the requirements specified in Warrant 4, the Pedestrian Volume warrant.*

**If applicable, attach all supporting calculations and documentation*

Are the requirements for Warrant 7 met?: No

OMUTCD WARRANT 8, ROADWAY NETWORK*

Does the intersection have a total existing, or immediately projected, entering volume of at least 1,000 vehicles per hour during the peak hour of a typical weekday and has 5-year projected traffic volumes, based on an engineering study, that meet one or more of Warrants 1, 2, and 3, during the average weekday?

Does the intersection have a total existing or immediately projected entering volume of at least 1,000 vehicles per hour for each of any 5 hours of a non-normal business day (Saturday or Sunday)?

Is the major street part of the street or highway system that serves as the principal roadway network for through traffic flow?

Does the major street include rural or suburban highways outside, entering, or traversing a city?

Does the major street appear as a major route on an official plan, such as a major street plan in an urban area traffic and transportation study?

**Refer to Section 4.3 of ODOT Publication 46 (Traffic Engineering Manual) for additional Department documentation requirements to justify the installation of a signal under Warrant 8. Attach all supplementary documentation and calculations especially those relating to traffic volume projections and subsequent Warrant analyses.*

Are the requirements for Warrant 8 met?:

OMUTCD WARRANT 9, INTERSECTION NEAR A GRADE CROSSING

Does the grade crossing exist on an approach controlled by a STOP or Yield sign and the center of the track nearest to the intersection is within 140 feet of the stop line or yield line on the approach?

During the highest traffic volume hour during which rail traffic uses the crossing, the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the minor-street approach that crosses the track (one direction only, approaching the intersection) falls above the applicable curve in Figure 4C-9 or 4C-10 for the existing combination of approach lanes over the track and the distance.

Number of approach lanes on the minor street approach that crosses the track:

Clear Storage Distance (D): feet

Highest Traffic Volume Hour During Which Rail Traffic Uses the Crossing*

*If the rail traffic arrival times are unknown, the highest traffic volume hour of the day should be used.

Major Street Volume (Total of Both Approaches): vph

Actual Minor-Street Volume (One Direction Only, Approaching the Intersection): vph

Apply Adjustment Factors to the Minor-Street Volume?:

Minor Street Approach Volume Adjustments*

*refers to Section 4C.10 of the OMUTCD for details on the application of these adjustments

	Inputs	Adjustment Factor
Occurrences of Rail Traffic per Day:		
% of High-Occupancy Buses (buses with at least 20 people) on Minor-Street Approach:		1
% of Tractor-Trailer Trucks on Minor-Street Approach:		
Adjusted Minor-Street Volume (One Direction Only, Approaching the Intersection)		N/A

Traffic Volumes for Figure Comparison

Major Street Volume (Total of Both Approaches):

Minor-Street Volume (One Direction Only, Approaching the Intersection):

Applicable Figure for Comparison:

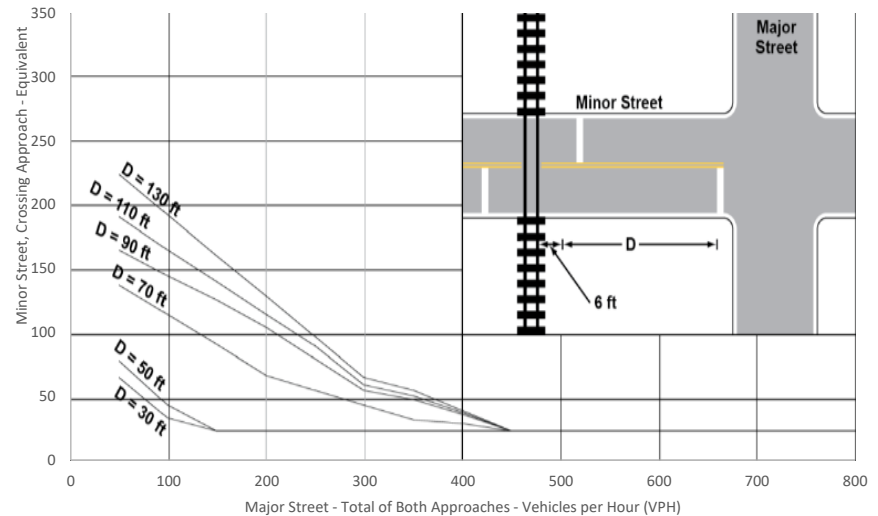
Based on Figure 4C-9, is Warrant 9 Met?:

*If point on graph is above the designated line, then Warrant is met.

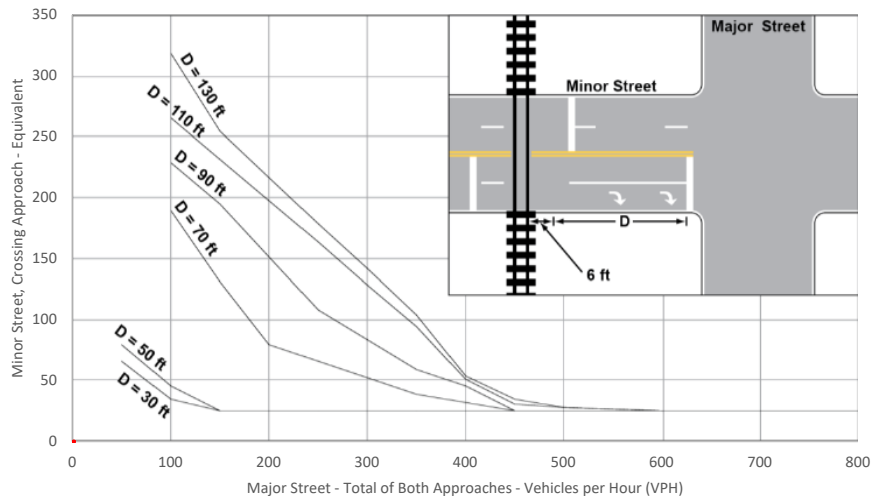
Figure 4C-9		Figure 4C-10	
Plot Points	Plot Points	Plot Points	Plot Points
0	0		
0	0		

Figure 4C-9		Figure 4C-10	
Plot Points	Plot Points	Plot Points	Plot Points

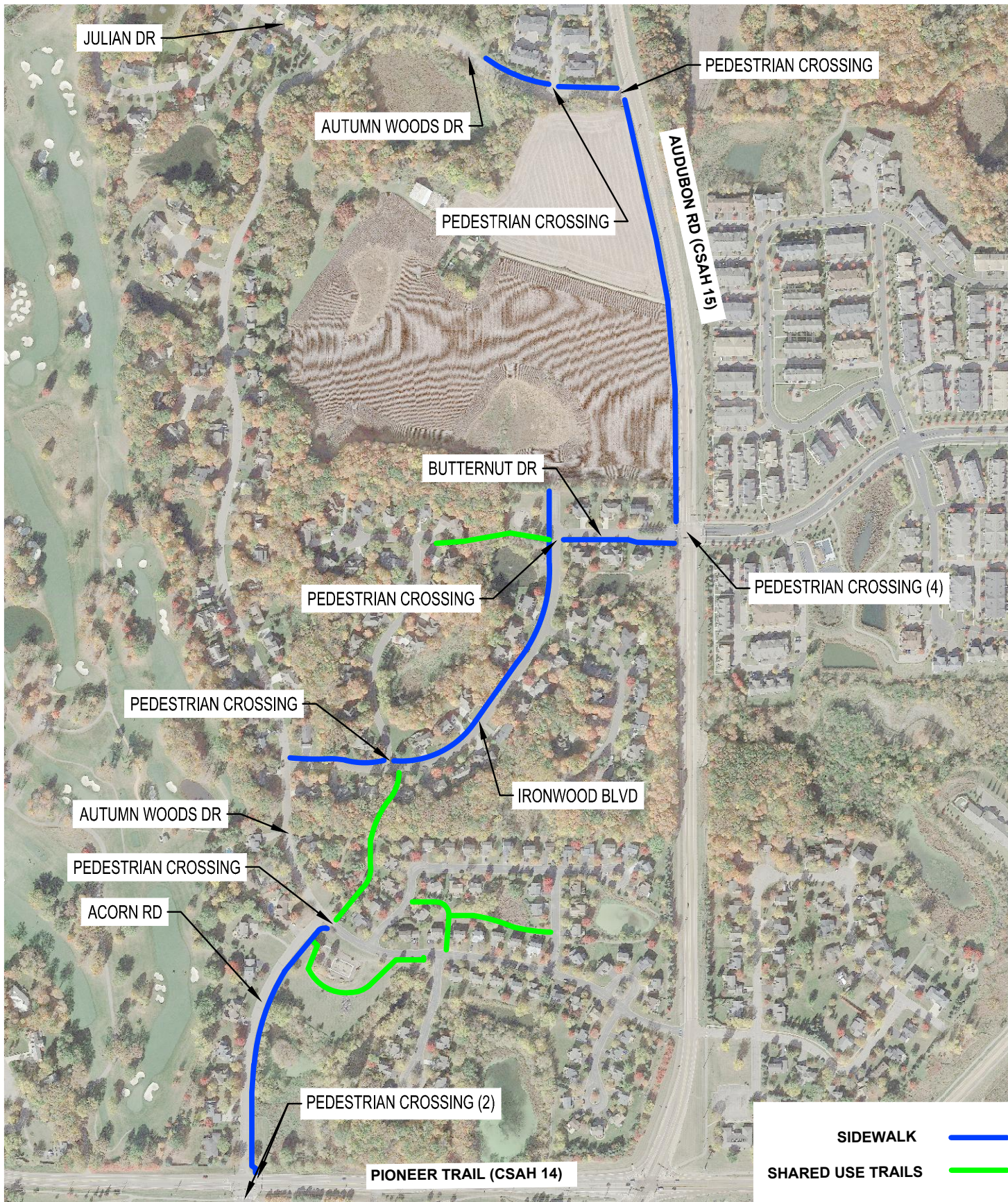
OMUTCD Figure 4C-9. Warrant 9, Intersection Near a Grade Crossing
(One Approach Lane at the Track Crossing)



OMUTCD Figure 4C-10. Warrant 9, Intersection Near a Grade Crossing
(Two or More Approach Lanes at the Track Crossing)

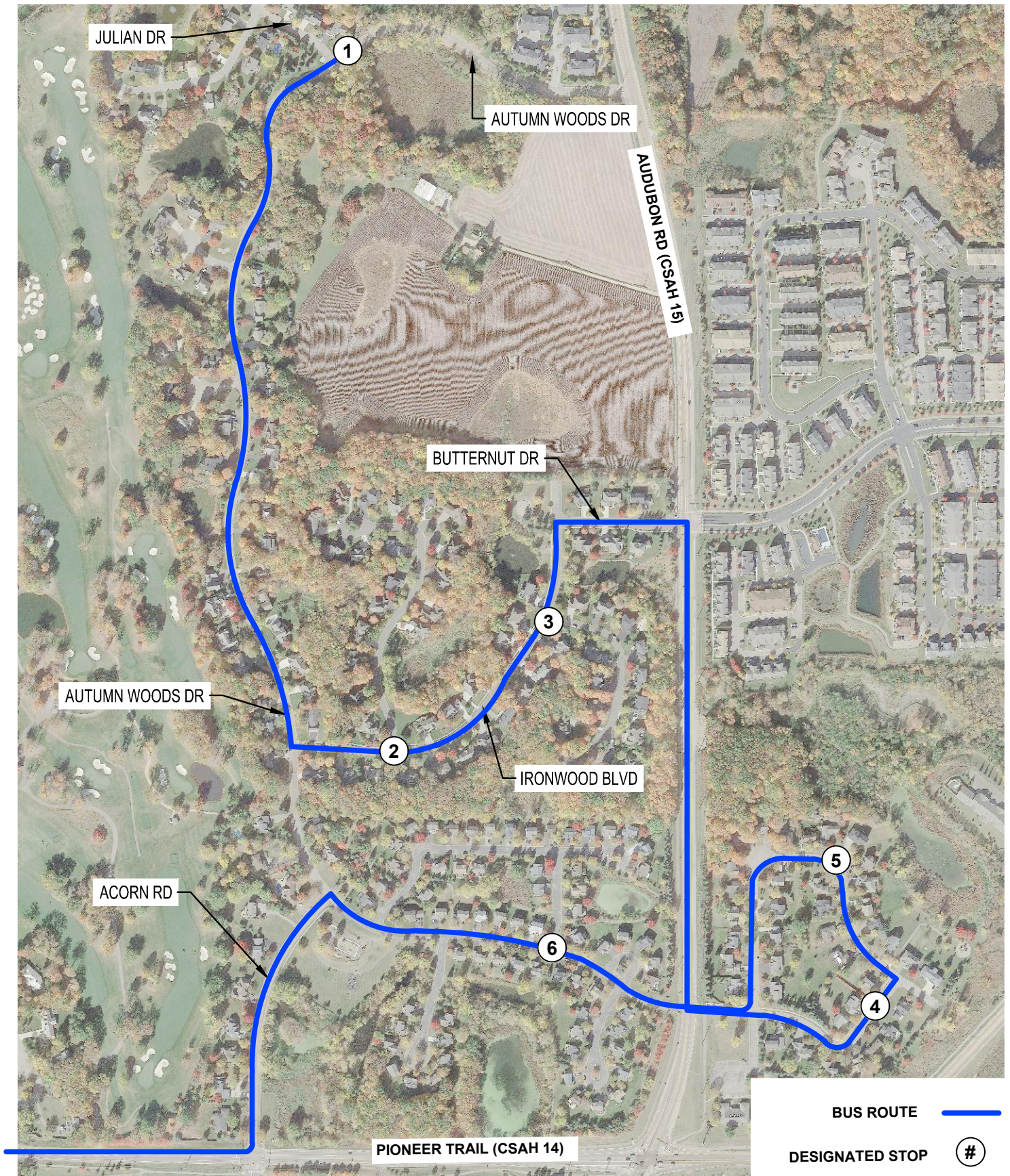


Appendix J: Existing Shared Use Trail + Sidewalks



EXISTING PEDESTRIAN FACILITY MAP

Appendix K: Existing Bus Routes



ELEMENTARY SCHOOL BUS ROUTE MAP

ISG

Architecture + Engineering + Environmental + Planning

9.B. Adopt Resolution 2021-67 and...

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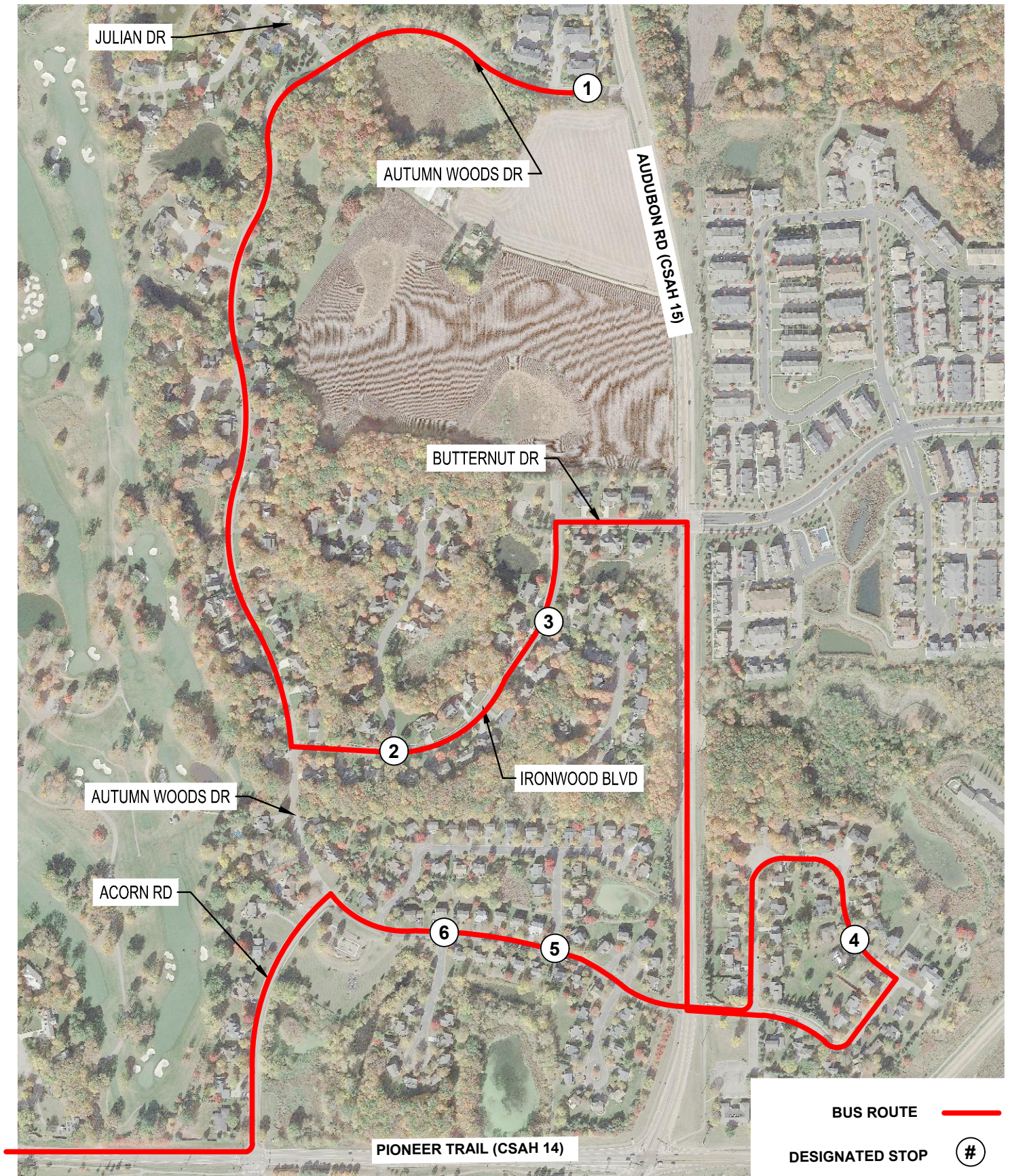
Page 208 of...

CAD FILE NAME: 21081 BUS ROUTES

Lennar Wagner Woods

Chaska, MN - 05/24/2021

ISG PROJECT NO. 21-24984

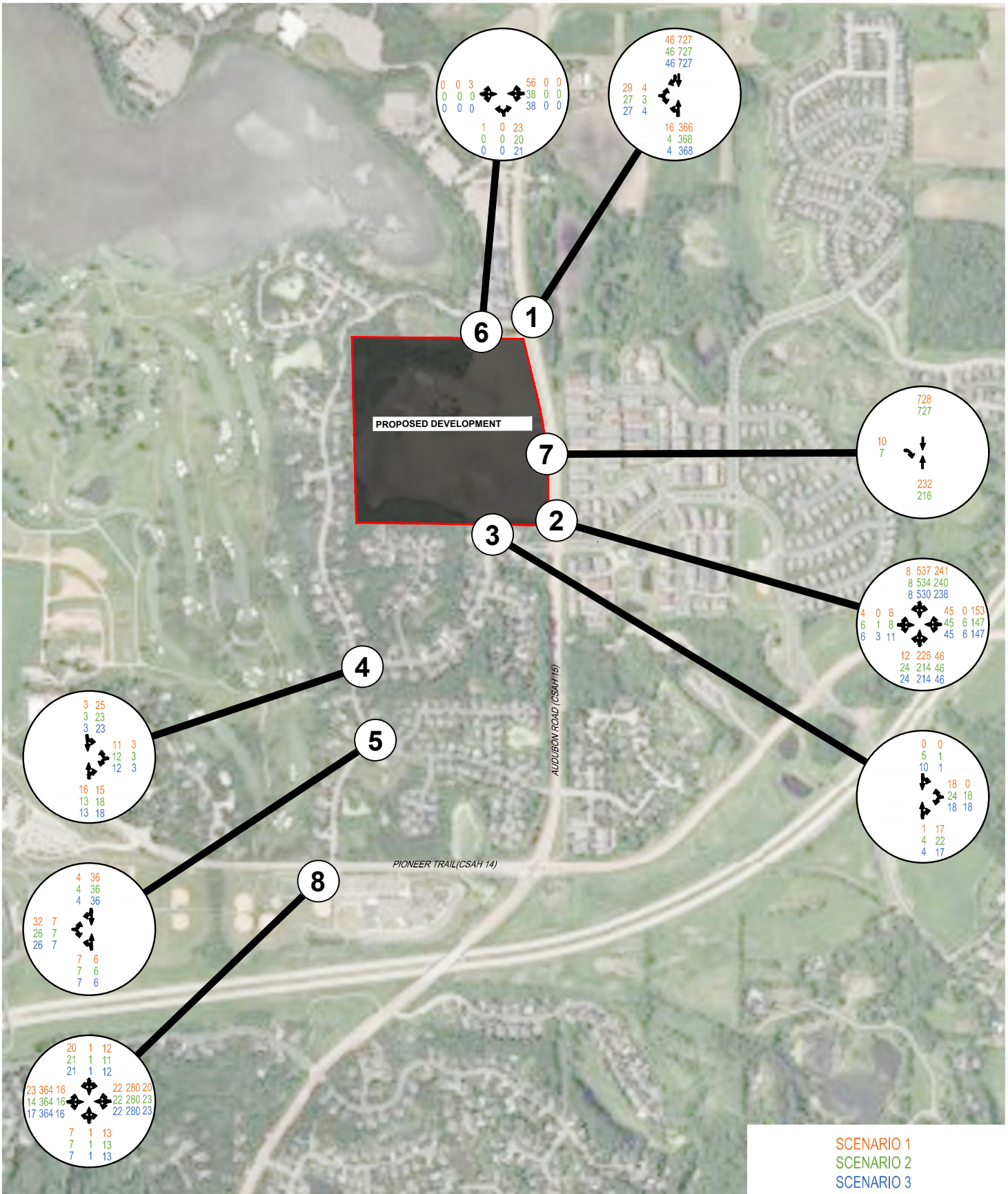


MIDDLE SCHOOL BUS ROUTE MAP

ISG

Architecture + Engineering + Environmental + Planning

Appendix L: Opening (2023) Volumes – Scenarios 1, 2, and 3



OPENING (2023) VOLUMES

0 500 1000
 SCALE: 1" = 1000 FEET



ISG

Architecture + Engineering + Environmental + Planning

9.B. Adopt Resolution 2021-67 and...

Packet Page 235 of...

The Reserve at Autumn Woods

Chaska, MN - 06/30/2021

ISG PROJECT NO. 2021-24984

Page 211 of...

CAD FILE NAME: 24984-115-EXHIBITS

Appendix M: Opening (2023) Synchro Analysis Worksheets – Scenarios 1, 2, and 3

Lanes, Volumes, Timings

3: Ironwood Blvd. & Butternut Dr.

07/01/2021



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	18	0	1	17	0	0
Future Volume (vph)	18	0	1	17	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	8	14	8	8	14
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.884					
Flt Protected	0.950					
Satd. Flow (prot)	1735	0	1704	0	0	2027
Flt Permitted	0.950					
Satd. Flow (perm)	1735	0	1704	0	0	2027
Link Speed (mph)	25	25		25		
Link Distance (ft)	495	372		154		
Travel Time (s)	13.5	10.1		4.2		
Confl. Peds. (#/hr)	2	5				
Peak Hour Factor	0.75	1.00	0.25	0.71	1.00	1.00
Heavy Vehicles (%)	11%	0%	0%	6%	0%	0%
Adj. Flow (vph)	24	0	4	24	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	24	0	28	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	14	0		0		
Link Offset(ft)	0	0		0		
Crosswalk Width(ft)	16	16		16		
Two way Left Turn Lane						
Headway Factor	0.92	1.20	0.92	1.20	1.20	0.92
Turning Speed (mph)	15	9	9		15	
Sign Control	Free	Yield		Yield		
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 14.9%				ICU Level of Service A		
Analysis Period (min) 15						

Intersection	
Intersection Delay, s/veh	7
Intersection LOS	A

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	4	35	7	6	23	7
Future Vol, veh/h	4	36	7	6	26	7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	0	0	0	0	4	6
Mvmt Flow	4	36	7	6	26	7
Number of Lanes	1	0	0	1	1	0

Approach	SE	NW	NE
Opposing Approach	NW	SE	
Opposing Lanes	1	1	0
Conflicting Approach Left		NE	SE
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NE		NW
Conflicting Lanes Right	1	0	1
HCM Control Delay	6.6	7.2	7.3
HCM LOS	A	A	A

Lane	NELn1	NWLn1	SELn1
Vol Left, %	79%	54%	0%
Vol Thru, %	0%	46%	10%
Vol Right, %	21%	0%	90%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	33	13	40
LT Vol	26	7	0
Through Vol	0	6	4
RT Vol	7	0	36
Lane Flow Rate	33	13	40
Geometry Grp	1	1	1
Degree of Util (X)	0.038	0.015	0.038
Departure Headway (Hd)	4.092	4.095	3.427
Convergence, Y/N	Yes	Yes	Yes
Cap	878	875	1045
Service Time	2.102	2.115	1.447
HCM Lane V/C Ratio	0.038	0.015	0.038
HCM Control Delay	7.3	7.2	6.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0	0.1

Intersection: 1: Audubon Rd. (CSAH 15) & Autumn Woods. Dr.

Movement	EB
Directions Served	LR
Maximum Queue (ft)	44
Average Queue (ft)	33
95th Queue (ft)	48
Link Distance (ft)	213
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

Movement	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	T	R	L	T	R	L	T	R
Maximum Queue (ft)	22	46	23	44	43	71	23	140	113	19
Average Queue (ft)	9	24	9	29	14	50	14	81	70	4
95th Queue (ft)	26	48	28	48	44	79	32	135	122	16
Link Distance (ft)	425		267			1116			802	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		130		130	242		242	230		230
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 3: Ironwood Blvd. & Butternut Dr.

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)	

Intersection: 4: Autumn Woods Dr. & Ironwood Blvd.

Movement	WB
Directions Served	LR
Maximum Queue (ft)	53
Average Queue (ft)	26
95th Queue (ft)	63
Link Distance (ft)	1147
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Acorn Rd. & Autumn Woods Dr.

Movement	SE	NW	NE
Directions Served	TR	LT	LR
Maximum Queue (ft)	31	31	31
Average Queue (ft)	24	18	30
95th Queue (ft)	44	43	31
Link Distance (ft)	540	381	1005
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Access A & Autumn Woods. Dr.

Movement	NB
Directions Served	LTR
Maximum Queue (ft)	27
Average Queue (ft)	16
95th Queue (ft)	38
Link Distance (ft)	158
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: Audubon Rd. (CSAH 15) & Access B

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)

Intersection: 22: Acorn Rd. & Pioneer Trail (CSAH. 14)/Pioneer Trail (CSAH 14)

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	R	L	T	R	R	LTR
Maximum Queue (ft)	27	248	54	45	212	14	21	24
Average Queue (ft)	9	144	22	16	115	5	4	14
95th Queue (ft)	27	249	56	44	216	16	18	32
Link Distance (ft)		580			489		103	1005
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	180		230	275		275		
Storage Blk Time (%)		6						
Queuing Penalty (veh)		2						

Network Summary

Network wide Queuing Penalty: 2

Lanes, Volumes, Timings

2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

07/01/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	4	0	6	45	0	147	12	214	46	238	529	8
Future Volume (vph)	6	1	8	45	6	147	24	214	46	240	534	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	15	8	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	130		130	242		242	230		230
Storage Lanes	0		0	1		1	1		1	1		1
Taper Length (ft)	25			68			90			68		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99				0.98						
Frt		0.929				0.850			0.850			0.850
Flt Protected		0.978		0.950			0.950			0.950		
Satd. Flow (prot)	0	1723	0	1656	1900	1599	1543	1845	1509	1752	1881	1615
Flt Permitted		0.858		0.731			0.294			0.492		
Satd. Flow (perm)	0	1512	0	1274	1900	1565	477	1845	1509	908	1881	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21				188			106			106
Link Speed (mph)		25			35			50			50	
Link Distance (ft)		495			305			1151			875	
Travel Time (s)		13.5			5.9			15.7			11.9	
Confl. Peds. (#/hr)						1						
Confl. Bikes (#/hr)			2									
Peak Hour Factor	0.33	1.00	0.38	0.75	1.00	0.78	0.50	0.70	0.61	0.79	0.78	0.50
Heavy Vehicles (%)	0%	0%	17%	9%	0%	1%	17%	3%	7%	3%	1%	0%
Adj. Flow (vph)	18	1	21	60	6	188	48	306	75	304	685	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	40	0	60	6	188	48	306	75	304	685	16
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			20			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		8			8			8			8	
Two way Left Turn Lane												
Headway Factor	1.20	0.88	1.20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left						Left	Thru			Thru	Right
Leading Detector (ft)	20	156		6	156	6	20	100	6	6	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		6	6	6	20	6	6	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		150			150			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	

Scenario 2 - Opening 2023 Scenario 2 - Opening 2023 3:30 pm 06/23/2021

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Lanes, Volumes, Timings

2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

07/01/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	5.0	12.0	12.0	5.0	12.0	12.0
Minimum Split (s)	36.3	36.3		35.8	35.8	35.8	9.5	29.2	29.2	9.5	28.3	28.3
Total Split (s)	36.3	36.3		36.3	36.3	36.3	9.5	29.2	29.2	9.5	29.2	29.2
Total Split (%)	48.4%	48.4%		48.4%	48.4%	48.4%	12.7%	38.9%	38.9%	12.7%	38.9%	38.9%
Maximum Green (s)	31.0	31.0		30.5	30.5	30.5	5.0	25.0	25.0	5.0	24.9	24.9
Yellow Time (s)	3.0	3.0		3.6	3.6	3.6	3.5	3.0	3.0	3.5	3.0	3.0
All-Red Time (s)	2.3	2.3		2.2	2.2	2.2	1.0	1.2	1.2	1.0	1.3	1.3
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.3		5.8	5.8	5.8	4.5	4.2	4.2	4.5	4.3	4.3
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		2.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)	9.0	9.0		8.0	8.0	8.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0	22.0		16.0	16.0		17.0	17.0
Pedestrian Calls (#/hr)	0	0		0	0	0		0	0		0	0
Act Effct Green (s)		8.2		7.7	7.7	7.7	29.7	25.0	25.0	32.4	30.7	30.7
Actuated g/C Ratio		0.16		0.15	0.15	0.15	0.57	0.48	0.48	0.62	0.59	0.59
v/c Ratio		0.16		0.32	0.02	0.48	0.13	0.35	0.10	0.47	0.62	0.02
Control Delay		14.0		24.8	19.0	8.6	4.5	10.1	1.6	7.3	12.9	0.0
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		14.0		24.8	19.0	8.6	4.5	10.1	1.6	7.3	12.9	0.0
LOS		B		C	B	A	A	B	A	A	B	A
Approach Delay		14.0			12.6			8.0			11.0	
Approach LOS		B			B			A			B	

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 52.2

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 10.6

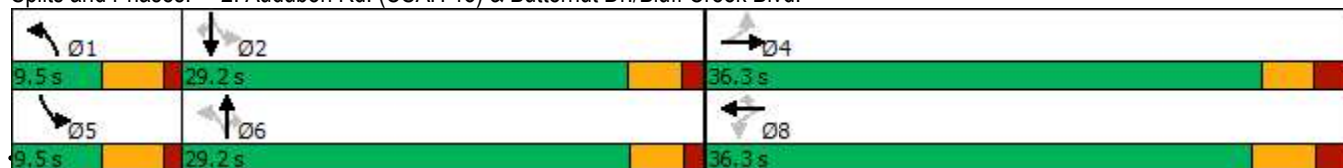
Intersection LOS: B

Intersection Capacity Utilization 50.6%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.



Scenario 2 - Opening 2023 Scenario 2 - Opening 2023 3:30 pm 06/23/2021

Synchro 11 Report

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Lanes, Volumes, Timings
3: Ironwood Blvd. & Butternut Dr.

07/01/2021

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	18	0	1	17	0	0
Future Volume (vph)	18	18	4	17	5	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	8	14	8	8	14
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.942		0.919			
Flt Protected	0.972					0.960
Satd. Flow (prot)	1746	0	1798	0	0	1946
Flt Permitted	0.972					0.960
Satd. Flow (perm)	1746	0	1798	0	0	1946
Link Speed (mph)	25		25			25
Link Distance (ft)	495		372			154
Travel Time (s)	13.5		10.1			4.2
Confl. Peds. (#/hr)	2			5		
Peak Hour Factor	0.75	1.00	0.25	0.71	1.00	1.00
Heavy Vehicles (%)	11%	0%	0%	6%	0%	0%
Adj. Flow (vph)	24	18	16	24	5	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	42	0	40	0	0	6
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	14		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	0.92	1.20	0.92	1.20	1.20	0.92
Turning Speed (mph)	15	9		9	15	
Sign Control	Free		Yield			Yield
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	14.9%			ICU Level of Service A		
Analysis Period (min)	15					

Lanes, Volumes, Timings

22: Acorn Rd. & Pioneer Trail (CSAH. 14)/Pioneer Trail (CSAH 14)

07/01/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	364	16	22	280	20	7	1	13	20	1	11
Future Volume (vph)	14	364	16	22	280	23	7	1	13	21	1	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	16	12	12	14	12
Storage Length (ft)	180		230	275		275	0		0	0		0
Storage Lanes	1		1	1		1	0		1	0		0
Taper Length (ft)	40			85			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.955	
Flt Protected	0.950			0.950				0.957			0.969	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	0	2020	1583	0	1839	0
Flt Permitted	0.527			0.413				0.885			0.879	
Satd. Flow (perm)	982	1863	1583	769	1863	1583	0	1868	1583	0	1668	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			51			51			51		12	
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		611			533			150			1082	
Travel Time (s)		9.3			8.1			4.1			29.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	15	396	17	24	304	25	8	1	14	23	1	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	15	396	17	24	304	25	0	9	14	0	36	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.92	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	0	2	1	0	2	
Detector Template							Thru			Thru		
Leading Detector (ft)	6	156	6	6	156	6	50	156	6	50	156	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	6	6	6	6	6	6	0	6	6	0	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		150			150			150			150	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		6			2			4			8	

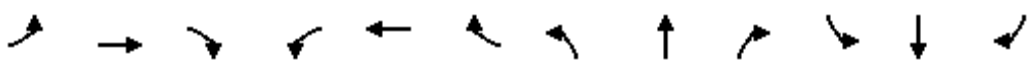
Scenario 2 - Opening 2023 Scenario 2 - Opening 2023 3:30 pm 06/23/2021

Synchro 11 Report
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Lanes, Volumes, Timings

22: Acorn Rd. & Pioneer Trail (CSAH. 14)/Pioneer Trail (CSAH 14)

07/01/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	6		6	2		2	4		4	8		
Detector Phase	6	6	6	2	2	2	4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	8.0	8.0	5.0	5.0	
Minimum Split (s)	25.8	25.8	25.8	30.1	30.1	30.1	34.5	34.5	34.5	24.1	24.1	
Total Split (s)	31.6	31.6	31.6	31.6	31.6	31.6	34.5	34.5	34.5	34.5	34.5	
Total Split (%)	47.8%	47.8%	47.8%	47.8%	47.8%	47.8%	52.2%	52.2%	52.2%	52.2%	52.2%	
Maximum Green (s)	25.8	25.8	25.8	25.5	25.5	25.5	29.0	29.0	29.0	28.4	28.4	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.3	1.3	1.3	1.6	1.6	1.6	2.0	2.0	2.0	2.6	2.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Lost Time (s)	5.8	5.8	5.8	6.1	6.1	6.1		5.5	5.5		6.1	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max	
Walk Time (s)				7.0	7.0	7.0	7.0	7.0	7.0			
Flash Dont Walk (s)				17.0	17.0	17.0	22.0	22.0	22.0			
Pedestrian Calls (#/hr)				0	0	0	0	0	0			
Act Effect Green (s)	25.8	25.8	25.8	25.5	25.5	25.5		29.0	29.0		28.4	
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.39	0.39		0.44	0.44		0.43	
v/c Ratio	0.04	0.54	0.03	0.08	0.42	0.04		0.01	0.02		0.05	
Control Delay	13.0	19.1	0.6	13.9	17.2	1.9		10.6	0.1		8.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	13.0	19.1	0.6	13.9	17.2	1.9		10.6	0.1		8.6	
LOS	B	B	A	B	B	A		B	A		A	
Approach Delay		18.1			15.9			4.2			8.6	
Approach LOS		B			B			A			A	

Intersection Summary

Area Type: Other

Cycle Length: 66.1

Actuated Cycle Length: 66.1

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.54

Intersection Signal Delay: 16.4

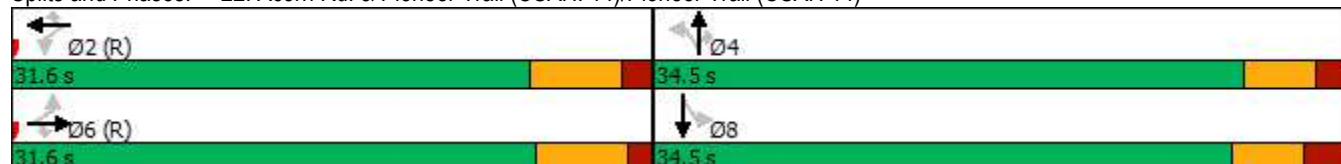
Intersection LOS: B

Intersection Capacity Utilization 54.5%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 22: Acorn Rd. & Pioneer Trail (CSAH. 14)/Pioneer Trail (CSAH 14)



Scenario 2 - Opening 2023 Scenario 2 - Opening 2023 3:30 pm 06/23/2021

Synchro 11 Report

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HCM 6th TWSC

1: Audubon Rd. (CSAH 15) & Autumn Woods. Dr.

07/01/2021

Intersection

Int Delay, s/veh 1.5

Movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	3	4	366	727	8
Future Vol, veh/h	27	3	4	368	727	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	195
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	58	25	50	91	77	67
Heavy Vehicles, %	14	0	25	2	1	0
Mvmt Flow	47	12	8	404	944	69

Major/Minor

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1364	944	1013
Stage 1	944	-	-
Stage 2	420	-	-
Critical Hdwy	6.54	6.2	4.35
Critical Hdwy Stg 1	5.54	-	-
Critical Hdwy Stg 2	5.54	-	-
Follow-up Hdwy	3.626	3.3	2.425
Pot Cap-1 Maneuver	153	321	602
Stage 1	360	-	-
Stage 2	638	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	150	321	602
Mov Cap-2 Maneuver	150	-	-
Stage 1	354	-	-
Stage 2	638	-	-

Approach

Approach	EB	NB	SB
HCM Control Delay, s	37.5	0.2	0
HCM LOS	E		

Minor Lane/Major Mvmt

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	602	-	168	-	-
HCM Lane V/C Ratio	0.013	-	0.349	-	-
HCM Control Delay (s)	11.1	0	37.5	-	-
HCM Lane LOS	B	A	E	-	-
HCM 95th %tile Q(veh)	0	-	1.5	-	-

Intersection						
Int Delay, s/veh	2.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	3	13	15	3	17
Future Vol, veh/h	12	3	13	18	3	17
Conflicting Peds, #/hr	6	0	0	6	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	69	75	81	63	75	71
Heavy Vehicles, %	0	100	20	31	100	36
Mvmt Flow	17	4	16	29	4	24
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	75	37	0	0	51	0
Stage 1	37	-	-	-	-	-
Stage 2	38	-	-	-	-	-
Critical Hdwy	6.4	7.2	-	-	5.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	4.2	-	-	3.1	-
Pot Cap-1 Maneuver	933	813	-	-	1104	-
Stage 1	991	-	-	-	-	-
Stage 2	990	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	916	808	-	-	1097	-
Mov Cap-2 Maneuver	916	-	-	-	-	-
Stage 1	984	-	-	-	-	-
Stage 2	979	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.1	0		1.2		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	894		1097	-	
HCM Lane V/C Ratio	-	0.024		0.004	-	
HCM Control Delay (s)	-	9.1		8.3	0	
HCM Lane LOS	-	A		A	A	
HCM 95th %tile Q(veh)	-	0.1		0	-	

Intersection												
Int Delay, s/veh	4.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	38	0	0	0	0	20	0	0	0
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	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	0	0	0	41	0	0	0	0	22	0	0	0
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	1	0	0	83	83	1	94	83	0
Stage 1	-	-	-	-	-	-	1	1	-	82	82	-
Stage 2	-	-	-	-	-	-	82	82	-	12	1	-
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	-	-	-	1622	-	-	904	807	1084	889	807	-
Stage 1	-	-	-	-	-	-	1022	895	-	926	827	-
Stage 2	-	-	-	-	-	-	926	827	-	1009	895	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	1622	-	-	-	787	1084	854	787	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	787	-	854	787	-
Stage 1	-	-	-	-	-	-	1022	895	-	926	806	-
Stage 2	-	-	-	-	-	-	903	806	-	989	895	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			7.3						0		
HCM LOS							-			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	-	-	-	1622	-	-	-				
HCM Lane V/C Ratio	-	-	-	-	0.025	-	-	-				
HCM Control Delay (s)	-	0	-	-	7.3	0	-	0				
HCM Lane LOS	-	A	-	-	A	A	-	A				
HCM 95th %tile Q(veh)	-	-	-	-	0.1	-	-	-				

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↗	↗	
Traffic Vol, veh/h	0	0	0	214	727	0
Future Vol, veh/h	0	7	0	216	727	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	8	0	235	790	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	790	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	390	0	-	-	0
Stage 1	0	-	0	-	-	0
Stage 2	0	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	-	390	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.4	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT EBLn1		SBT			
Capacity (veh/h)	-		390	-		
HCM Lane V/C Ratio	-		0.02	-		
HCM Control Delay (s)	-		14.4	-		
HCM Lane LOS	-		B	-		
HCM 95th %tile Q(veh)	-		0.1	-		

Lanes, Volumes, Timings
3: Ironwood Blvd. & Butternut Dr.

07/01/2021



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	18	0	1	17	0	0
Future Volume (vph)	18	18	4	17	5	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	8	14	8	8	14
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.942		0.919			
Flt Protected	0.972					0.960
Satd. Flow (prot)	1746	0	1798	0	0	1946
Flt Permitted	0.972					0.960
Satd. Flow (perm)	1746	0	1798	0	0	1946
Link Speed (mph)	25		25			25
Link Distance (ft)	495		372			154
Travel Time (s)	13.5		10.1			4.2
Confl. Peds. (#/hr)	2			5		
Peak Hour Factor	0.75	1.00	0.25	0.71	1.00	1.00
Heavy Vehicles (%)	11%	0%	0%	6%	0%	0%
Adj. Flow (vph)	24	18	16	24	5	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	42	0	40	0	0	6
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	14		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	0.92	1.20	0.92	1.20	1.20	0.92
Turning Speed (mph)	15	9		9	15	
Sign Control	Free		Yield			Yield
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	14.9%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection	
Intersection Delay, s/veh	7
Intersection LOS	A

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	4	35	7	6	23	7
Future Vol, veh/h	4	36	7	6	26	7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	0	0	0	0	4	6
Mvmt Flow	4	36	7	6	26	7
Number of Lanes	1	0	0	1	1	0

Approach	SE	NW	NE
Opposing Approach	NW	SE	
Opposing Lanes	1	1	0
Conflicting Approach Left		NE	SE
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NE		NW
Conflicting Lanes Right	1	0	1
HCM Control Delay	6.6	7.2	7.3
HCM LOS	A	A	A

Lane	NELn1	NWLn1	SELn1
Vol Left, %	79%	54%	0%
Vol Thru, %	0%	46%	10%
Vol Right, %	21%	0%	90%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	33	13	40
LT Vol	26	7	0
Through Vol	0	6	4
RT Vol	7	0	36
Lane Flow Rate	33	13	40
Geometry Grp	1	1	1
Degree of Util (X)	0.038	0.015	0.038
Departure Headway (Hd)	4.092	4.095	3.427
Convergence, Y/N	Yes	Yes	Yes
Cap	878	875	1045
Service Time	2.102	2.115	1.447
HCM Lane V/C Ratio	0.038	0.015	0.038
HCM Control Delay	7.3	7.2	6.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0	0.1

Queuing and Blocking Report

06/29/2021

Intersection: 1: Audubon Rd. (CSAH 15) & Autumn Woods. Dr.

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	65	26
Average Queue (ft)	22	5
95th Queue (ft)	68	22
Link Distance (ft)	766	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

Movement	EB	WB	WB	NB	NB	NB	SB	SB	
Directions Served	LTR	L	R	L	T	R	L	T	
Maximum Queue (ft)	22	69	83	30	73	29	107	132	
Average Queue (ft)	14	43	57	10	54	15	78	100	
95th Queue (ft)	28	76	82	32	80	37	124	148	
Link Distance (ft)	425					1116			806
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	130		130	242	242		230		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 3: Ironwood Blvd. & Butternut Dr.

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)

Intersection: 4: Autumn Woods Dr. & Ironwood Blvd.

Movement	WB
Directions Served	LR
Maximum Queue (ft)	29
Average Queue (ft)	12
95th Queue (ft)	35
Link Distance (ft)	1147
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Acorn Rd. & Autumn Woods Dr.

Movement	SE	NW	NE
Directions Served	TR	LT	LR
Maximum Queue (ft)	55	31	54
Average Queue (ft)	30	6	29
95th Queue (ft)	58	27	58
Link Distance (ft)	540	381	1005
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Autumn Woods. Dr.

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)

Intersection: 22: Acorn Rd. & Pioneer Trail (Co. Rd. 14)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	R	L	T	R	LT	R	LTR
Maximum Queue (ft)	30	155	31	45	131	12	25	21	46
Average Queue (ft)	23	108	17	22	82	2	5	9	18
95th Queue (ft)	43	159	40	45	136	11	21	26	46
Link Distance (ft)		580			489		103	103	1005
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	180		230	275		275			
Storage Blk Time (%)									
Queuing Penalty (veh)									

Network Summary

Network wide Queuing Penalty: 0

Lanes, Volumes, Timings

2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

06/29/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	4	0	6	45	0	147	12	214	46	238	529	8
Future Volume (vph)	6	3	11	45	6	147	24	214	46	238	530	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	15	8	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	130		130	242		242	230		230
Storage Lanes	0		0	1		1	1		1	1		1
Taper Length (ft)	25			68			90			68		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99				0.98						
Frt		0.922				0.850			0.850			0.850
Flt Protected		0.982		0.950			0.950			0.950		
Satd. Flow (prot)	0	1701	0	1656	1900	1599	1543	1845	1509	1752	1881	1615
Flt Permitted		0.883		0.724			0.298			0.492		
Satd. Flow (perm)	0	1529	0	1262	1900	1565	484	1845	1509	908	1881	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29				188			106			106
Link Speed (mph)		25			35			50			50	
Link Distance (ft)		495			305			1151			875	
Travel Time (s)		13.5			5.9			15.7			11.9	
Confl. Peds. (#/hr)						1						
Confl. Bikes (#/hr)			2									
Peak Hour Factor	0.33	1.00	0.38	0.75	1.00	0.78	0.50	0.70	0.61	0.79	0.78	0.50
Heavy Vehicles (%)	0%	0%	17%	9%	0%	1%	17%	3%	7%	3%	1%	0%
Adj. Flow (vph)	18	3	29	60	6	188	48	306	75	301	679	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	50	0	60	6	188	48	306	75	301	679	16
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			20			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		8			8			8			8	
Two way Left Turn Lane												
Headway Factor	1.20	0.88	1.20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left						Left	Thru			Thru	Right
Leading Detector (ft)	20	156		6	156	6	20	100	6	6	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		6	6	6	20	6	6	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		150			150			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	

Scenario 3 - Opening 2023 Scenario 3 - Opening 2023 3:30 pm 06/23/2021

Synchro 11 Report

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Lanes, Volumes, Timings

2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

06/29/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	5.0	12.0	12.0	5.0	12.0	12.0
Minimum Split (s)	36.3	36.3		35.8	35.8	35.8	9.5	29.2	29.2	9.5	28.3	28.3
Total Split (s)	36.3	36.3		36.3	36.3	36.3	9.5	29.2	29.2	9.5	29.2	29.2
Total Split (%)	48.4%	48.4%		48.4%	48.4%	48.4%	12.7%	38.9%	38.9%	12.7%	38.9%	38.9%
Maximum Green (s)	31.0	31.0		30.5	30.5	30.5	5.0	25.0	25.0	5.0	24.9	24.9
Yellow Time (s)	3.0	3.0		3.6	3.6	3.6	3.5	3.0	3.0	3.5	3.0	3.0
All-Red Time (s)	2.3	2.3		2.2	2.2	2.2	1.0	1.2	1.2	1.0	1.3	1.3
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.3		5.8	5.8	5.8	4.5	4.2	4.2	4.5	4.3	4.3
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		2.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)	9.0	9.0		8.0	8.0	8.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0	22.0		16.0	16.0		17.0	17.0
Pedestrian Calls (#/hr)	0	0		0	0	0		0	0		0	0
Act Effct Green (s)		8.2		7.7	7.7	7.7	29.7	25.0	25.0	32.5	30.7	30.7
Actuated g/C Ratio		0.16		0.15	0.15	0.15	0.57	0.48	0.48	0.62	0.59	0.59
v/c Ratio		0.19		0.32	0.02	0.48	0.13	0.35	0.10	0.47	0.62	0.02
Control Delay		13.2		24.8	18.8	8.5	4.5	10.2	1.6	7.2	12.8	0.0
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		13.2		24.8	18.8	8.5	4.5	10.2	1.6	7.2	12.8	0.0
LOS		B		C	B	A	A	B	A	A	B	A
Approach Delay		13.3			12.6			8.0			10.9	
Approach LOS		B			B			A			B	
Queue Length 50th (ft)		6		17	2	0	4	52	0	29	82	0
Queue Length 95th (ft)		29		37	10	29	7	77	2	55	228	0
Internal Link Dist (ft)		415			225			1071			795	
Turn Bay Length (ft)				130		130	242		242	230		230
Base Capacity (vph)		918		736	1109	991	376	882	777	644	1104	991
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.05		0.08	0.01	0.19	0.13	0.35	0.10	0.47	0.62	0.02

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 52.3

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.62

Scenario 3 - Opening 2023 Scenario 3 - Opening 2023 3:30 pm 06/23/2021

Synchro 11 Report

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Lanes, Volumes, Timings

2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

06/29/2021

Intersection Signal Delay: 10.5

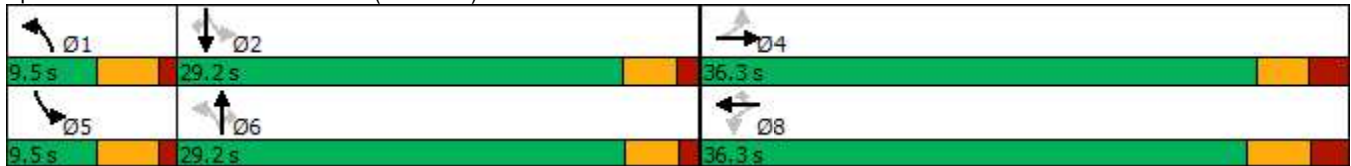
Intersection LOS: B

Intersection Capacity Utilization 50.6%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.



Lanes, Volumes, Timings
22: Acorn Rd. & Pioneer Trail (Co. Rd. 14)

06/29/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	364	16	22	280	20	7	1	13	20	1	11
Future Volume (vph)	17	364	16	22	280	20	7	1	13	20	1	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	16	12	12	14	12
Storage Length (ft)	180		230	275		275	0		0	0		0
Storage Lanes	1		1	1		1	0		1	0		0
Taper Length (ft)	40			85			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.951	
Flt Protected	0.950			0.950				0.957			0.970	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	0	2020	1583	0	1833	0
Flt Permitted	0.527			0.413				0.885			0.885	
Satd. Flow (perm)	982	1863	1583	769	1863	1583	0	1868	1583	0	1672	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			51			51			51		13	
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		611			533			150			1082	
Travel Time (s)		9.3			8.1			4.1			29.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	18	396	17	24	304	22	8	1	14	22	1	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	396	17	24	304	22	0	9	14	0	36	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.92	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	0	2	1	0	2	
Detector Template							Thru			Thru		
Leading Detector (ft)	6	156	6	6	156	6	50	156	6	50	156	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	6	6	6	6	6	6	0	6	6	0	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		150			150			150			150	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		6			2			4			8	

Scenario 3 - Opening 2023 Scenario 3 - Opening 2023 3:30 pm 06/23/2021

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Lanes, Volumes, Timings
22: Acorn Rd. & Pioneer Trail (Co. Rd. 14)

06/29/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	6		6	2		2	4		4	8		
Detector Phase	6	6	6	2	2	2	4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	8.0	8.0	5.0	5.0	
Minimum Split (s)	25.8	25.8	25.8	30.1	30.1	30.1	34.5	34.5	34.5	24.1	24.1	
Total Split (s)	31.6	31.6	31.6	31.6	31.6	31.6	34.5	34.5	34.5	34.5	34.5	
Total Split (%)	47.8%	47.8%	47.8%	47.8%	47.8%	47.8%	52.2%	52.2%	52.2%	52.2%	52.2%	
Maximum Green (s)	25.8	25.8	25.8	25.5	25.5	25.5	29.0	29.0	29.0	28.4	28.4	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.3	1.3	1.3	1.6	1.6	1.6	2.0	2.0	2.0	2.6	2.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Lost Time (s)	5.8	5.8	5.8	6.1	6.1	6.1		5.5	5.5		6.1	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max	
Walk Time (s)				7.0	7.0	7.0	7.0	7.0	7.0			
Flash Dont Walk (s)				17.0	17.0	17.0	22.0	22.0	22.0			
Pedestrian Calls (#/hr)				0	0	0	0	0	0			
Act Effct Green (s)	25.8	25.8	25.8	25.5	25.5	25.5		29.0	29.0		28.4	
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.39	0.39		0.44	0.44		0.43	
v/c Ratio	0.05	0.54	0.03	0.08	0.42	0.03		0.01	0.02		0.05	
Control Delay	13.1	19.1	0.6	13.9	17.2	1.6		10.6	0.1		8.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	13.1	19.1	0.6	13.9	17.2	1.6		10.6	0.1		8.4	
LOS	B	B	A	B	B	A		B	A		A	
Approach Delay		18.1			16.0			4.2			8.4	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)	4	120	0	6	87	0		2	0		5	
Queue Length 95th (ft)	16	198	2	20	148	5		9	1		20	
Internal Link Dist (ft)		531			453			70			1002	
Turn Bay Length (ft)	180		230	275		275						
Base Capacity (vph)	383	727	648	296	718	642		819	723		725	
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	
Reduced v/c Ratio	0.05	0.54	0.03	0.08	0.42	0.03		0.01	0.02		0.05	
Intersection Summary												
Area Type:	Other											
Cycle Length:	66.1											
Actuated Cycle Length:	66.1											
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green												
Natural Cycle: 65												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.54												
Intersection Signal Delay: 16.4						Intersection LOS: B						
Intersection Capacity Utilization 54.5%						ICU Level of Service A						
Analysis Period (min) 15												

Scenario 3 - Opening 2023 Scenario 3 - Opening 2023 3:30 pm 06/23/2021

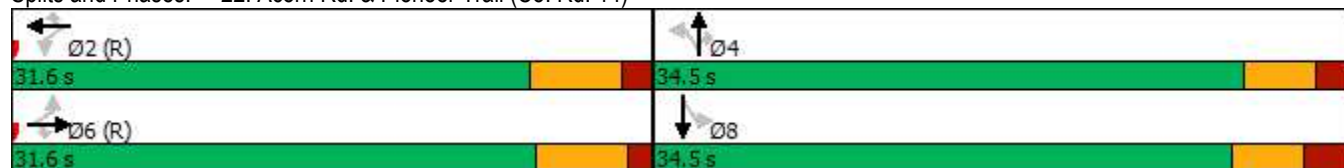
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Lanes, Volumes, Timings

22: Acorn Rd. & Pioneer Trail (Co. Rd. 14)

06/29/2021

Splits and Phases: 22: Acorn Rd. & Pioneer Trail (Co. Rd. 14)



Intersection

Int Delay, s/veh 1.6

Movement EBL EBR NBL NBT SBT SBRLane Configurations 

Traffic Vol, veh/h 7 3 4 366 727 8

Future Vol, veh/h 27 4 4 368 727 46

Conflicting Peds, #/hr 0 0 0 0 0 0

Sign Control Stop Stop Free Free Free Free

RT Channelized - None - None - None

Storage Length 0 - - - - 195

Veh in Median Storage, # 0 - - 0 0 -

Grade, % 0 - - 0 0 -

Peak Hour Factor 58 25 50 91 77 67

Heavy Vehicles, % 14 0 25 2 1 0

Mvmt Flow 47 16 8 404 944 69

Major/Minor Minor2 Major1 Major2

Conflicting Flow All 1364 944 1013 0 - 0

Stage 1 944 - - - - -

Stage 2 420 - - - - -

Critical Hdwy 6.54 6.2 4.35 - - -

Critical Hdwy Stg 1 5.54 - - - - -

Critical Hdwy Stg 2 5.54 - - - - -

Follow-up Hdwy 3.626 3.3 2.425 - - -

Pot Cap-1 Maneuver 153 321 602 - - -

Stage 1 360 - - - - -

Stage 2 638 - - - - -

Platoon blocked, % - - -

Mov Cap-1 Maneuver 150 321 602 - - -

Mov Cap-2 Maneuver 150 - - - - -

Stage 1 354 - - - - -

Stage 2 638 - - - - -

Approach EB NB SB

HCM Control Delay, s 36.9 0.2 0

HCM LOS E

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h) 602 - 174 - -

HCM Lane V/C Ratio 0.013 - 0.359 - -

HCM Control Delay (s) 11.1 0 36.9 - -

HCM Lane LOS B A E - -

HCM 95th %tile Q(veh) 0 - 1.5 - -

Intersection

Int Delay, s/veh 2.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	3	13	15	3	17
Future Vol, veh/h	12	3	13	18	3	17
Conflicting Peds, #/hr	6	0	0	6	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	69	75	81	63	75	71
Heavy Vehicles, %	0	100	20	31	100	36
Mvmt Flow	17	4	16	29	4	24

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	75	37	0
Stage 1	37	-	-
Stage 2	38	-	-
Critical Hdwy	6.4	7.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	4.2	-
Pot Cap-1 Maneuver	933	813	-
Stage 1	991	-	-
Stage 2	990	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	916	808	-
Mov Cap-2 Maneuver	916	-	-
Stage 1	984	-	-
Stage 2	979	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	1.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	894	1097
HCM Lane V/C Ratio	-	-	0.024	0.004
HCM Control Delay (s)	-	-	9.1	8.3
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	38	0	0	0	0	21	0	0	0
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	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	0	0	0	41	0	0	0	0	23	0	0	0
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	1	0	0	83	83	1	95	83	0
Stage 1	-	-	-	-	-	-	1	1	-	82	82	-
Stage 2	-	-	-	-	-	-	82	82	-	13	1	-
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	-	-	-	1622	-	-	904	807	1084	888	807	-
Stage 1	-	-	-	-	-	-	1022	895	-	926	827	-
Stage 2	-	-	-	-	-	-	926	827	-	1007	895	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	1622	-	-	-	787	1084	852	787	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	787	-	852	787	-
Stage 1	-	-	-	-	-	-	1022	895	-	926	806	-
Stage 2	-	-	-	-	-	-	903	806	-	986	895	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			7.3						0		
HCM LOS							-			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	-	-	-	1622	-	-	-				
HCM Lane V/C Ratio	-	-	-	-	0.025	-	-	-				
HCM Control Delay (s)	-	0	-	-	7.3	0	-	0				
HCM Lane LOS	-	A	-	-	A	A	-	A				
HCM 95th %tile Q(veh)	-	-	-	-	0.1	-	-	-				

Lanes, Volumes, Timings
3: Ironwood Blvd. & Butternut Dr.

06/29/2021

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	18	0	1	17	0	0
Future Volume (vph)	18	18	4	17	10	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	8	14	8	8	14
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.942		0.919			
Flt Protected	0.972					0.957
Satd. Flow (prot)	1746	0	1798	0	0	1940
Flt Permitted	0.972					0.957
Satd. Flow (perm)	1746	0	1798	0	0	1940
Link Speed (mph)	25		25			25
Link Distance (ft)	495		372			154
Travel Time (s)	13.5		10.1			4.2
Confl. Peds. (#/hr)	2			5		
Peak Hour Factor	0.75	1.00	0.25	0.71	1.00	1.00
Heavy Vehicles (%)	11%	0%	0%	6%	0%	0%
Adj. Flow (vph)	24	18	16	24	10	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	42	0	40	0	0	11
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	14		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	0.92	1.20	0.92	1.20	1.20	0.92
Turning Speed (mph)	15	9		9	15	
Sign Control	Free		Yield			Yield
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	14.9%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection	
Intersection Delay, s/veh	7
Intersection LOS	A

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	4	35	7	6	23	7
Future Vol, veh/h	4	36	7	6	26	7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	0	0	0	0	4	6
Mvmt Flow	4	36	7	6	26	7
Number of Lanes	1	0	0	1	1	0

Approach	SE	NW	NE
Opposing Approach	NW	SE	
Opposing Lanes	1	1	0
Conflicting Approach Left		NE	SE
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NE		NW
Conflicting Lanes Right	1	0	1
HCM Control Delay	6.6	7.2	7.3
HCM LOS	A	A	A

Lane	NELn1	NWLn1	SELn1
Vol Left, %	79%	54%	0%
Vol Thru, %	0%	46%	10%
Vol Right, %	21%	0%	90%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	33	13	40
LT Vol	26	7	0
Through Vol	0	6	4
RT Vol	7	0	36
Lane Flow Rate	33	13	40
Geometry Grp	1	1	1
Degree of Util (X)	0.038	0.015	0.038
Departure Headway (Hd)	4.092	4.095	3.427
Convergence, Y/N	Yes	Yes	Yes
Cap	878	875	1045
Service Time	2.102	2.115	1.447
HCM Lane V/C Ratio	0.038	0.015	0.038
HCM Control Delay	7.3	7.2	6.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0	0.1

Intersection: 1: Audubon Rd. (CSAH 15) & Autumn Woods. Dr.

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	109	199
Average Queue (ft)	43	91
95th Queue (ft)	103	232
Link Distance (ft)	213	778
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

Movement	WB	WB	NB	NB	SB	SB
Directions Served	L	R	T	R	L	T
Maximum Queue (ft)	46	82	85	23	74	70
Average Queue (ft)	32	32	47	5	40	55
95th Queue (ft)	54	74	84	20	72	84
Link Distance (ft)			1116			802
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	130	130		242	230	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: Ironwood Blvd. & Butternut Dr.

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)

Intersection: 4: Autumn Woods Dr. & Ironwood Blvd.

Movement	WB
Directions Served	LR
Maximum Queue (ft)	29
Average Queue (ft)	6
95th Queue (ft)	25
Link Distance (ft)	1147
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Acorn Rd. & Autumn Woods Dr.

Movement	SE	NW	NE
Directions Served	TR	LT	LR
Maximum Queue (ft)	32	31	49
Average Queue (ft)	31	6	16
95th Queue (ft)	32	26	49
Link Distance (ft)	540	381	1005
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Access A & Autumn Woods. Dr.

Movement	NB
Directions Served	LTR
Maximum Queue (ft)	54
Average Queue (ft)	27
95th Queue (ft)	55
Link Distance (ft)	158
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: Audubon Rd. (CSAH 15) & Access B

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)

Intersection: 8: Acorn Rd. & Pioneer Trail (CSAH 14)

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	R	L	T	R	LT	LTR
Maximum Queue (ft)	27	203	25	25	149	11	51	46
Average Queue (ft)	5	131	5	12	90	2	10	19
95th Queue (ft)	23	220	22	30	157	9	44	47
Link Distance (ft)		580			489		103	1005
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	180		230	275		275		
Storage Blk Time (%)		2						
Queuing Penalty (veh)		1						

Network Summary

Network wide Queuing Penalty: 1

HCM 6th TWSC

1: Audubon Rd. (CSAH 15) & Autumn Woods. Dr.

07/01/2021

Intersection

Int Delay, s/veh 2.4

Movement

	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	3	4	366	727	8
Future Vol, veh/h	29	4	22	366	727	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	195
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	58	25	50	91	77	67
Heavy Vehicles, %	14	0	25	2	1	0
Mvmt Flow	50	16	44	402	944	69

Major/Minor

	Minor2	Major1	Major2
Conflicting Flow All	1434	944	1013
Stage 1	944	-	-
Stage 2	490	-	-
Critical Hdwy	6.54	6.2	4.35
Critical Hdwy Stg 1	5.54	-	-
Critical Hdwy Stg 2	5.54	-	-
Follow-up Hdwy	3.626	3.3	2.425
Pot Cap-1 Maneuver	139	321	602
Stage 1	360	-	-
Stage 2	592	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	126	321	602
Mov Cap-2 Maneuver	126	-	-
Stage 1	326	-	-
Stage 2	592	-	-

Approach

	EB	NB	SB
HCM Control Delay, s	47.6	1.1	0
HCM LOS	E		

Minor Lane/Major Mvmt

	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	602	-	148	-	-
HCM Lane V/C Ratio	0.073	-	0.446	-	-
HCM Control Delay (s)	11.5	0	47.6	-	-
HCM Lane LOS	B	A	E	-	-
HCM 95th %tile Q(veh)	0.2	-	2	-	-

Intersection						
Int Delay, s/veh	2.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	3	13	15	3	17
Future Vol, veh/h	11	3	16	15	3	18
Conflicting Peds, #/hr	6	0	0	6	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	69	75	81	63	75	71
Heavy Vehicles, %	0	100	20	31	100	36
Mvmt Flow	16	4	20	24	4	25
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	77	38	0	0	50	0
Stage 1	38	-	-	-	-	-
Stage 2	39	-	-	-	-	-
Critical Hdwy	6.4	7.2	-	-	5.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	4.2	-	-	3.1	-
Pot Cap-1 Maneuver	931	812	-	-	1105	-
Stage 1	990	-	-	-	-	-
Stage 2	989	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	914	807	-	-	1098	-
Mov Cap-2 Maneuver	914	-	-	-	-	-
Stage 1	983	-	-	-	-	-
Stage 2	978	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.1	0		1.1		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	890	1098	-	
HCM Lane V/C Ratio	-	-	0.022	0.004	-	
HCM Control Delay (s)	-	-	9.1	8.3	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Future Vol, veh/h	0	0	3	56	0	0	1	0	23	0	0	0
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	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	0	0	3	61	0	0	1	0	25	0	0	0
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	3	0	0	124	124	2	136	125	0
Stage 1	-	-	-	-	-	-	2	2	-	122	122	-
Stage 2	-	-	-	-	-	-	122	122	-	14	3	-
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	-	-	-	1619	-	-	850	766	1082	835	765	-
Stage 1	-	-	-	-	-	-	1021	894	-	882	795	-
Stage 2	-	-	-	-	-	-	882	795	-	1006	893	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	1619	-	-	-	737	1082	792	736	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	737	-	792	736	-
Stage 1	-	-	-	-	-	-	1021	894	-	882	765	-
Stage 2	-	-	-	-	-	-	848	765	-	983	893	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			7.3						0		
HCM LOS							-			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	-	-	-	1619	-	-	-				
HCM Lane V/C Ratio	-	-	-	-	0.038	-	-	-				
HCM Control Delay (s)	-	0	-	-	7.3	0	-	0				
HCM Lane LOS	-	A	-	-	A	A	-	A				
HCM 95th %tile Q(veh)	-	-	-	-	0.1	-	-	-				

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑	↑	
Traffic Vol, veh/h	0	0	0	214	727	0
Future Vol, veh/h	0	10	0	232	728	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	11	0	252	791	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	791	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	390	0	-	-	0
Stage 1	0	-	0	-	-	0
Stage 2	0	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	-	390	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.5	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT EBLn1		SBT			
Capacity (veh/h)	- 390		-			
HCM Lane V/C Ratio	- 0.028		-			
HCM Control Delay (s)	- 14.5		-			
HCM Lane LOS	- B		-			
HCM 95th %tile Q(veh)	- 0.1		-			

Lanes, Volumes, Timings

2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

07/01/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	4	0	6	45	0	147	12	214	46	238	529	8
Future Volume (vph)	4	0	6	45	0	153	12	226	46	241	537	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	15	8	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	130		130	242		242	230		230
Storage Lanes	0		0	1		1	1		1	1		1
Taper Length (ft)	25			68			90			68		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99				0.98						
Frt		0.923				0.850			0.850			0.850
Flt Protected		0.979		0.950			0.950			0.950		
Satd. Flow (prot)	0	1700	0	1656	1900	1599	1543	1845	1509	1752	1881	1615
Flt Permitted		0.874		0.739			0.317			0.465		
Satd. Flow (perm)	0	1518	0	1288	1900	1565	515	1845	1509	858	1881	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		84				441			106			106
Link Speed (mph)		25			35			50			50	
Link Distance (ft)		495			305			1151			875	
Travel Time (s)		13.5			5.9			15.7			11.9	
Confl. Peds. (#/hr)						1						
Confl. Bikes (#/hr)			2									
Peak Hour Factor	0.33	1.00	0.38	0.75	1.00	0.78	0.50	0.70	0.61	0.79	0.78	0.50
Heavy Vehicles (%)	0%	0%	17%	9%	0%	1%	17%	3%	7%	3%	1%	0%
Adj. Flow (vph)	12	0	16	60	0	196	24	323	75	305	688	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	28	0	60	0	196	24	323	75	305	688	16
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			20			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		8			8			8			8	
Two way Left Turn Lane												
Headway Factor	1.20	0.88	1.20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left						Left	Thru			Thru	Right
Leading Detector (ft)	20	156		6	156	6	20	100	6	6	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		6	6	6	20	6	6	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		150			150			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	

Scenario 1 - Opening 2023 Scenario 1 - Opening 2023 3:30 pm 06/23/2021

Synchro 11 Report
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Lanes, Volumes, Timings

2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

07/01/2021

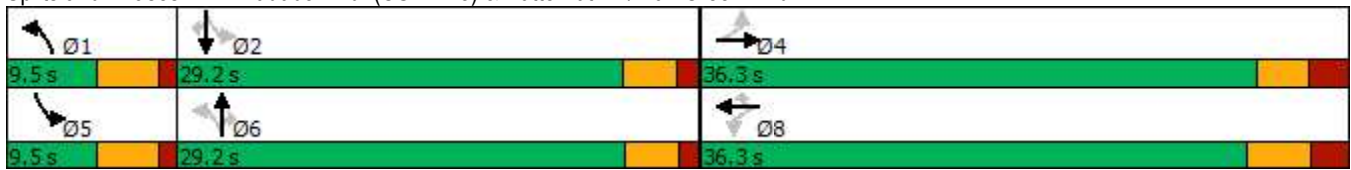
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm		Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	5.0	12.0	12.0	5.0	12.0	12.0
Minimum Split (s)	36.3	36.3		35.8	35.8	35.8	9.5	29.2	29.2	9.5	28.3	28.3
Total Split (s)	36.3	36.3		36.3	36.3	36.3	9.5	29.2	29.2	9.5	29.2	29.2
Total Split (%)	48.4%	48.4%		48.4%	48.4%	48.4%	12.7%	38.9%	38.9%	12.7%	38.9%	38.9%
Yellow Time (s)	3.0	3.0		3.6	3.6	3.6	3.5	3.0	3.0	3.5	3.0	3.0
All-Red Time (s)	2.3	2.3		2.2	2.2	2.2	1.0	1.2	1.2	1.0	1.3	1.3
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.3		5.8	5.8	5.8	4.5	4.2	4.2	4.5	4.3	4.3
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)		8.2		7.7		7.7	29.7	25.0	25.0	33.3	32.6	32.6
Actuated g/C Ratio		0.16		0.15		0.15	0.57	0.48	0.48	0.64	0.62	0.62
v/c Ratio		0.09		0.32		0.32	0.06	0.37	0.10	0.48	0.59	0.02
Control Delay		0.6		24.6		1.4	4.0	10.3	1.6	7.4	10.8	0.0
Queue Delay		0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		0.6		24.6		1.4	4.0	10.3	1.6	7.4	10.8	0.0
LOS		A		C		A	A	B	A	A	B	A
Approach Delay		0.6			6.9			8.4			9.6	
Approach LOS		A			A			A			A	
Queue Length 50th (ft)		0		17		0	2	56	0	29	84	0
Queue Length 95th (ft)		1		36		0	5	81	2	55	231	0
Internal Link Dist (ft)		415			225			1071			795	
Turn Bay Length (ft)				130		130	242		242	230		230
Base Capacity (vph)		935		752		1097	391	883	778	633	1173	1047
Starvation Cap Reductn		0		0		0	0	0	0	0	0	0
Spillback Cap Reductn		0		0		0	0	0	0	0	0	0
Storage Cap Reductn		0		0		0	0	0	0	0	0	0
Reduced v/c Ratio		0.03		0.08		0.18	0.06	0.37	0.10	0.48	0.59	0.02
Intersection Summary												
Area Type:	Other											
Cycle Length: 75												
Actuated Cycle Length: 52.2												
Natural Cycle: 80												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.59												
Intersection Signal Delay: 8.8				Intersection LOS: A								
Intersection Capacity Utilization 50.6%				ICU Level of Service A								
Analysis Period (min) 15												

Lanes, Volumes, Timings

2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

07/01/2021

Splits and Phases: 2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.



Lanes, Volumes, Timings
8: Acorn Rd. & Pioneer Trail (CSAH 14)

07/01/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	364	16	22	280	20	7	1	13	20	1	11
Future Volume (vph)	14	364	16	22	280	23	7	1	13	20	1	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	16	12	12	14	12
Storage Length (ft)	180		230	275		275	0		0	0		0
Storage Lanes	1		1	1		1	0		1	0		0
Taper Length (ft)	40			85			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr't			0.850			0.850			0.850		0.951	
Flt Protected	0.950			0.950				0.957			0.970	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	0	2020	1583	0	1833	0
Flt Permitted	0.527			0.413				0.885			0.885	
Satd. Flow (perm)	982	1863	1583	769	1863	1583	0	1868	1583	0	1672	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			51			51			51		13	
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		611			533			150			1082	
Travel Time (s)		9.3			8.1			4.1			29.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	15	396	17	24	304	25	8	1	14	22	1	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	15	396	17	24	304	25	0	9	14	0	36	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.92	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	0	2	1	0	2	
Detector Template							Thru			Thru		
Leading Detector (ft)	6	156	6	6	156	6	50	156	6	50	156	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	6	6	6	6	6	6	0	6	6	0	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		150			150			150			150	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		6			2			4			8	

Scenario 1 - Opening 2023 Scenario 1 - Opening 2023 3:30 pm 06/23/2021

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Lanes, Volumes, Timings

8: Acorn Rd. & Pioneer Trail (CSAH 14)

07/01/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	6		6	2		2	4		4	8		
Detector Phase	6	6	6	2	2	2	4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	8.0	8.0	5.0	5.0	
Minimum Split (s)	25.8	25.8	25.8	30.1	30.1	30.1	34.5	34.5	34.5	24.1	24.1	
Total Split (s)	31.6	31.6	31.6	31.6	31.6	31.6	34.5	34.5	34.5	34.5	34.5	
Total Split (%)	47.8%	47.8%	47.8%	47.8%	47.8%	47.8%	52.2%	52.2%	52.2%	52.2%	52.2%	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.3	1.3	1.3	1.6	1.6	1.6	2.0	2.0	2.0	2.6	2.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Lost Time (s)	5.8	5.8	5.8	6.1	6.1	6.1		5.5	5.5		6.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max	
Act Effct Green (s)	25.8	25.8	25.8	25.5	25.5	25.5		29.0	29.0		28.4	
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.39	0.39		0.44	0.44		0.43	
v/c Ratio	0.04	0.54	0.03	0.08	0.42	0.04		0.01	0.02		0.05	
Control Delay	13.0	19.1	0.6	13.9	17.2	1.9		10.6	0.1		8.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	13.0	19.1	0.6	13.9	17.2	1.9		10.6	0.1		8.4	
LOS	B	B	A	B	B	A		B	A		A	
Approach Delay		18.1			15.9			4.2			8.4	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)	4	120	0	6	87	0		2	0		5	
Queue Length 95th (ft)	14	198	2	20	148	6		9	1		20	
Internal Link Dist (ft)		531			453			70			1002	
Turn Bay Length (ft)	180		230	275		275						
Base Capacity (vph)	383	727	648	296	718	642		819	723		725	
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	
Reduced v/c Ratio	0.04	0.54	0.03	0.08	0.42	0.04		0.01	0.02		0.05	

Intersection Summary

Area Type: Other

Cycle Length: 66.1

Actuated Cycle Length: 66.1

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.54

Intersection Signal Delay: 16.4

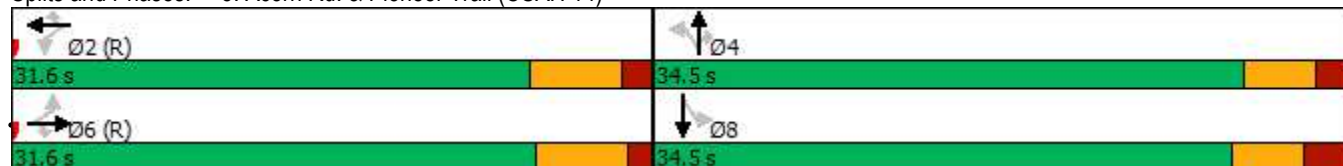
Intersection LOS: B

Intersection Capacity Utilization 54.5%

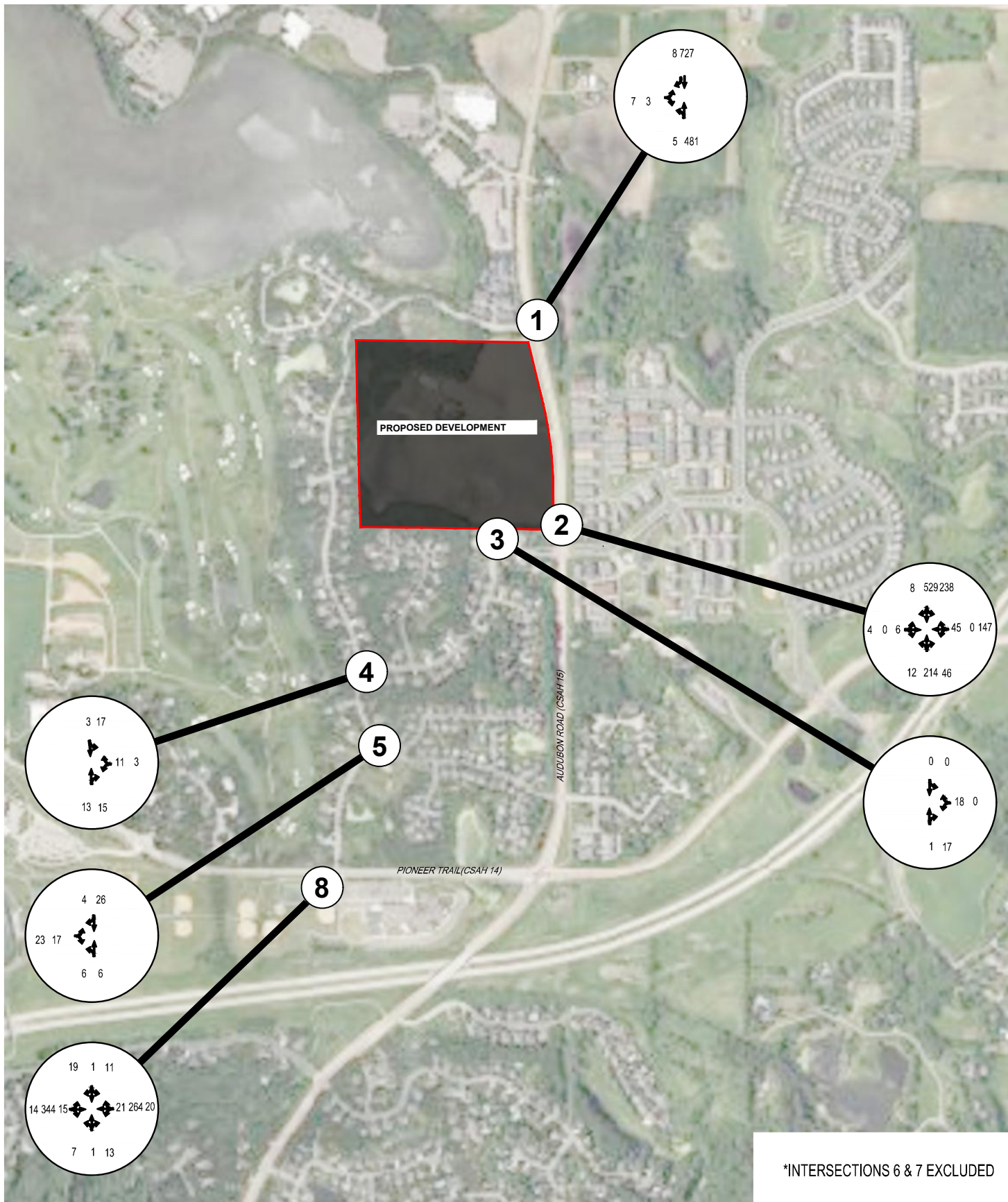
ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 8: Acorn Rd. & Pioneer Trail (CSAH 14)

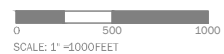


Appendix N: No Build (2023) Volumes



*INTERSECTIONS 6 & 7 EXCLUDED

NO BUILD (2023) VOLUMES



Appendix O: No Build (2023) Synchro Analysis Worksheets

Lanes, Volumes, Timings

2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

06/29/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	0	6	45	0	147	12	214	46	238	529	8
Future Volume (vph)	4	0	6	45	0	147	12	214	46	238	529	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	15	8	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	130		130	242		242	230		230
Storage Lanes	0		0	1		1	1		1	1		1
Taper Length (ft)	25			68			90			68		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99				0.98						
Frt		0.923				0.850			0.850			0.850
Flt Protected		0.979		0.950			0.950			0.950		
Satd. Flow (prot)	0	1700	0	1656	1900	1599	1543	1845	1509	1752	1881	1615
Flt Permitted		0.861		0.739			0.328			0.574		
Satd. Flow (perm)	0	1495	0	1288	1900	1565	533	1845	1509	1059	1881	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22				387			75			47
Link Speed (mph)		25			25			50			50	
Link Distance (ft)		495			305			1151			1689	
Travel Time (s)		13.5			8.3			15.7			23.0	
Confl. Peds. (#/hr)						1						
Confl. Bikes (#/hr)			2									
Peak Hour Factor	0.33	1.00	0.38	0.75	1.00	0.78	0.50	0.70	0.61	0.79	0.78	0.50
Heavy Vehicles (%)	0%	0%	17%	9%	0%	1%	17%	3%	7%	3%	1%	0%
Adj. Flow (vph)	12	0	16	60	0	188	24	306	75	301	678	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	28	0	60	0	188	24	306	75	301	678	16
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			20			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		8			8			8			8	
Two way Left Turn Lane												
Headway Factor	1.20	0.88	1.20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left						Left	Thru			Thru	Right
Leading Detector (ft)	20	156		6	156	6	20	100	6	6	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		6	6	6	20	6	6	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		150			150			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	

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Synchro 11 Report
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Lanes, Volumes, Timings

2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

06/29/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm		Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			6			2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	6	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	12.0	12.0	12.0	12.0	12.0	12.0
Minimum Split (s)	36.3	36.3		35.8	35.8	35.8	29.2	29.2	29.2	28.3	28.3	28.3
Total Split (s)	36.3	36.3		36.3	36.3	36.3	29.2	29.2	29.2	29.2	29.2	29.2
Total Split (%)	55.4%	55.4%		55.4%	55.4%	55.4%	44.6%	44.6%	44.6%	44.6%	44.6%	44.6%
Yellow Time (s)	3.0	3.0		3.6	3.6	3.6	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.3	2.3		2.2	2.2	2.2	1.2	1.2	1.2	1.3	1.3	1.3
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.3		5.8	5.8	5.8	4.2	4.2	4.2	4.3	4.3	4.3
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None	None	Max	Max	Max	Max	Max	Max
Act Effect Green (s)		7.8		7.4		7.4	29.0	29.0	29.0	28.9	28.9	28.9
Actuated g/C Ratio		0.18		0.17		0.17	0.67	0.67	0.67	0.67	0.67	0.67
v/c Ratio		0.10		0.27		0.32	0.07	0.25	0.07	0.42	0.54	0.01
Control Delay		9.3		18.6		1.4	4.7	4.8	1.6	7.5	7.5	0.6
Queue Delay		0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		9.3		18.6		1.4	4.7	4.8	1.6	7.5	7.5	0.6
LOS		A		B		A	A	A	A	A	A	A
Approach Delay		9.3			5.6			4.2			7.3	
Approach LOS		A			A			A			A	
Queue Length 50th (ft)		1		13		0	2	28	0	33	82	0
Queue Length 95th (ft)		15		30		0	5	45	5	68	134	0
Internal Link Dist (ft)		415			225			1071			1609	
Turn Bay Length (ft)				130		130	242		242	230		230
Base Capacity (vph)		1082		911		1220	358	1241	1039	710	1262	1099
Starvation Cap Reductn		0		0		0	0	0	0	0	0	0
Spillback Cap Reductn		0		0		0	0	0	0	0	0	0
Storage Cap Reductn		0		0		0	0	0	0	0	0	0
Reduced v/c Ratio		0.03		0.07		0.15	0.07	0.25	0.07	0.42	0.54	0.01

Intersection Summary

Area Type: Other

Cycle Length: 65.5

Actuated Cycle Length: 43.1

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.54

Intersection Signal Delay: 6.4

Intersection LOS: A

Intersection Capacity Utilization 56.2%

ICU Level of Service B

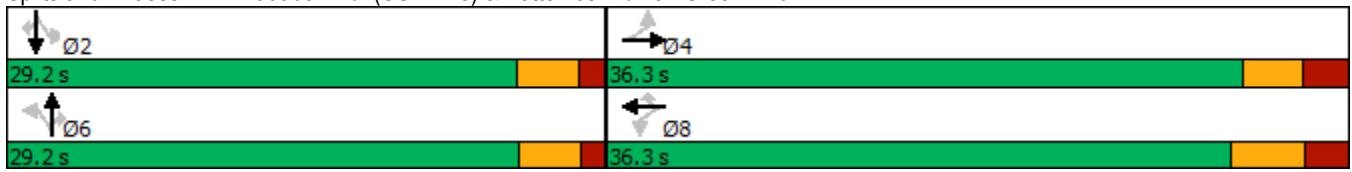
Analysis Period (min) 15

Lanes, Volumes, Timings

2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

06/29/2021

Splits and Phases: 2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.



Lanes, Volumes, Timings
7: Acorn Rd. & Pioneer Trail (Co. Rd. 14)

06/29/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	344	15	21	264	20	7	1	13	19	1	11
Future Volume (vph)	14	344	15	21	264	20	7	1	13	19	1	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	16	12	12	14	12
Storage Length (ft)	180		230	275		275	0		0	0		0
Storage Lanes	1		1	1		1	0		1	0		0
Taper Length (ft)	40			85			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frts			0.850			0.850			0.850		0.952	
Flt Protected	0.950			0.950				0.957			0.970	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	0	2020	1583	0	1835	0
Flt Permitted	0.548			0.438				0.886			0.886	
Satd. Flow (perm)	1021	1863	1583	816	1863	1583	0	1870	1583	0	1676	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			51			51			51		12	
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		611			533			150			1082	
Travel Time (s)		9.3			8.1			4.1			29.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	15	374	16	23	287	22	8	1	14	21	1	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	15	374	16	23	287	22	0	9	14	0	34	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.92	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	0	2	1	0	1	
Detector Template							Thru			Thru		
Leading Detector (ft)	6	156	6	6	156	6	50	156	6	50	6	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	6	6	6	6	6	6	0	6	6	0	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		150			150			150				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		6			2			4			8	

2023 No Build 2023 No Build 3:30 pm 06/23/2021

Synchro 11 Report
Page 8

Lanes, Volumes, Timings
7: Acorn Rd. & Pioneer Trail (Co. Rd. 14)

06/29/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	6		6	2		2	4		4	8		
Detector Phase	6	6	6	2	2	2	4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	8.0	8.0	5.0	5.0	
Minimum Split (s)	25.8	25.8	25.8	30.1	30.1	30.1	34.5	34.5	34.5	24.1	24.1	
Total Split (s)	31.6	31.6	31.6	31.6	31.6	31.6	34.5	34.5	34.5	34.5	34.5	
Total Split (%)	47.8%	47.8%	47.8%	47.8%	47.8%	47.8%	52.2%	52.2%	52.2%	52.2%	52.2%	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.3	1.3	1.3	1.6	1.6	1.6	2.0	2.0	2.0	2.6	2.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Lost Time (s)	5.8	5.8	5.8	6.1	6.1	6.1		5.5	5.5		6.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max	
Act Effct Green (s)	25.8	25.8	25.8	25.5	25.5	25.5		29.0	29.0		28.4	
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.39	0.39		0.44	0.44		0.43	
v/c Ratio	0.04	0.51	0.02	0.07	0.40	0.03		0.01	0.02		0.05	
Control Delay	12.9	18.5	0.4	13.7	16.8	1.6		10.6	0.1		8.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	12.9	18.5	0.4	13.7	16.8	1.6		10.6	0.1		8.5	
LOS	B	B	A	B	B	A		B	A		A	
Approach Delay		17.6			15.6			4.2			8.5	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)	4	112	0	6	81	0		2	0		5	
Queue Length 95th (ft)	14	185	2	19	140	5		9	1		19	
Internal Link Dist (ft)		531			453			70			1002	
Turn Bay Length (ft)	180		230	275		275						
Base Capacity (vph)	398	727	648	314	718	642		820	723		726	
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	
Reduced v/c Ratio	0.04	0.51	0.02	0.07	0.40	0.03		0.01	0.02		0.05	

Intersection Summary

Area Type: Other

Cycle Length: 66.1

Actuated Cycle Length: 66.1

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.51

Intersection Signal Delay: 16.0

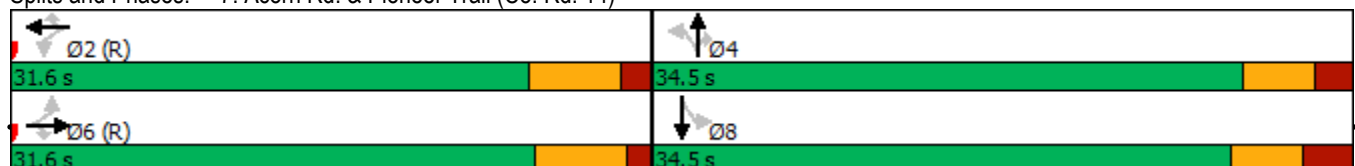
Intersection LOS: B

Intersection Capacity Utilization 54.5%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 7: Acorn Rd. & Pioneer Trail (Co. Rd. 14)



Lanes, Volumes, Timings
3: Ironwood Blvd. & Butternut Dr.

06/29/2021

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	18	0	1	17	0	0
Future Volume (vph)	18	0	1	17	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	8	14	8	8	14
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.884					
Flt Protected	0.950					
Satd. Flow (prot)	1735	0	1704	0	0	2027
Flt Permitted	0.950					
Satd. Flow (perm)	1735	0	1704	0	0	2027
Link Speed (mph)	25	25		25		
Link Distance (ft)	495	372		154		
Travel Time (s)	13.5	10.1		4.2		
Confl. Peds. (#/hr)	2	5				
Peak Hour Factor	0.75	1.00	0.25	0.71	1.00	1.00
Heavy Vehicles (%)	11%	0%	0%	6%	0%	0%
Adj. Flow (vph)	24	0	4	24	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	24	0	28	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	14	0		0		
Link Offset(ft)	0	0		0		
Crosswalk Width(ft)	16	16		16		
Two way Left Turn Lane						
Headway Factor	0.92	1.20	0.92	1.20	1.20	0.92
Turning Speed (mph)	15	9	9		15	
Sign Control	Free	Yield		Yield		
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	14.9%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection

Int Delay, s/veh 0.5

Movement EBL EBR NBL NBT SBT SBRLane Configurations 

Traffic Vol, veh/h 7 3 4 366 727 8

Future Vol, veh/h 7 3 4 366 727 8

Conflicting Peds, #/hr 0 0 0 0 0 0

Sign Control Stop Stop Free Free Free Free

RT Channelized - None - None - None

Storage Length 0 - - - - 195

Veh in Median Storage, # 0 - - 0 0 -

Grade, % 0 - - 0 0 -

Peak Hour Factor 58 25 50 91 77 67

Heavy Vehicles, % 14 0 25 2 1 0

Mvmt Flow 12 12 8 402 944 12

Major/Minor Minor2 Major1 Major2

Conflicting Flow All 1362 944 956 0 - 0

Stage 1 944 - - - - -

Stage 2 418 - - - - -

Critical Hdwy 6.54 6.2 4.35 - - -

Critical Hdwy Stg 1 5.54 - - - - -

Critical Hdwy Stg 2 5.54 - - - - -

Follow-up Hdwy 3.626 3.3 2.425 - - -

Pot Cap-1 Maneuver 154 321 634 - - -

Stage 1 360 - - - - -

Stage 2 639 - - - - -

Platoon blocked, % - - -

Mov Cap-1 Maneuver 152 321 634 - - -

Mov Cap-2 Maneuver 152 - - - - -

Stage 1 354 - - - - -

Stage 2 639 - - - - -

Approach EB NB SB

HCM Control Delay, s 24.8 0.2 0

HCM LOS C

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h) 634 - 206 - -

HCM Lane V/C Ratio 0.013 - 0.117 - -

HCM Control Delay (s) 10.8 0 24.8 - -

HCM Lane LOS B A C - -

HCM 95th %tile Q(veh) 0 - 0.4 - -

Intersection

Int Delay, s/veh 2.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	3	13	15	3	17
Future Vol, veh/h	11	3	13	15	3	17
Conflicting Peds, #/hr	6	0	0	6	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	69	75	81	63	75	71
Heavy Vehicles, %	0	100	20	31	100	36
Mvmt Flow	16	4	16	24	4	24

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	72	34	0
Stage 1	34	-	-
Stage 2	38	-	-
Critical Hdwy	6.4	7.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	4.2	-
Pot Cap-1 Maneuver	937	817	-
Stage 1	994	-	-
Stage 2	990	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	920	812	-
Mov Cap-2 Maneuver	920	-	-
Stage 1	987	-	-
Stage 2	979	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	1.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	896	1103
HCM Lane V/C Ratio	-	-	0.022	0.004
HCM Control Delay (s)	-	-	9.1	8.3
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

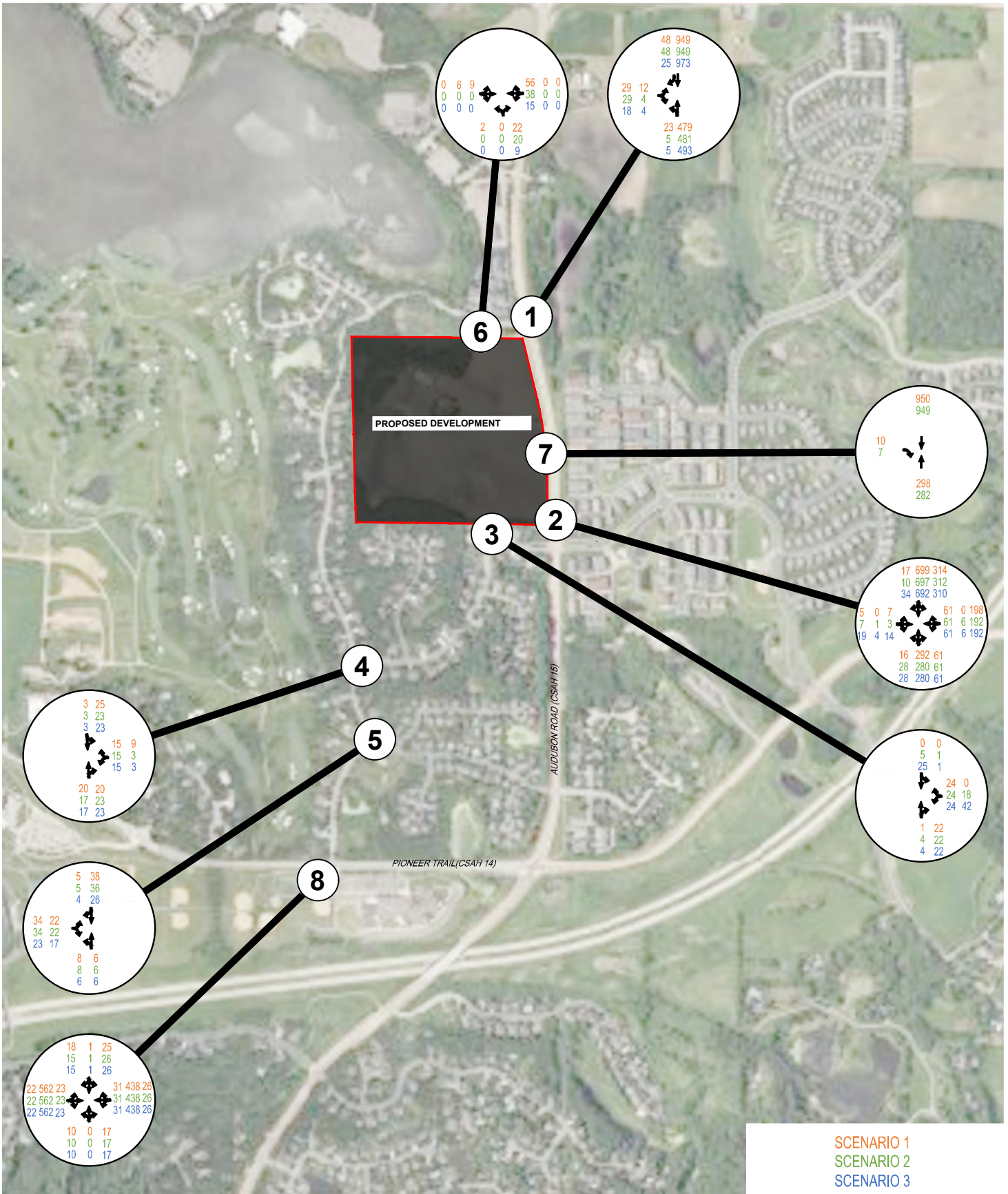
Intersection	
Intersection Delay, s/veh	6.9
Intersection LOS	A

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	4	26	6	6	23	17
Future Vol, veh/h	4	26	6	6	23	17
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	0	0	0	0	4	6
Mvmt Flow	4	26	6	6	23	17
Number of Lanes	1	0	0	1	1	0

Approach	SE	NW	NE
Opposing Approach	NW	SE	
Opposing Lanes	1	1	0
Conflicting Approach Left		NE	SE
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NE		NW
Conflicting Lanes Right	1	0	1
HCM Control Delay	6.6	7.2	7.1
HCM LOS	A	A	A

Lane	NELn1	NWLn1	SELn1
Vol Left, %	57%	50%	0%
Vol Thru, %	0%	50%	13%
Vol Right, %	42%	0%	87%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	40	12	30
LT Vol	23	6	0
Through Vol	0	6	4
RT Vol	17	0	26
Lane Flow Rate	40	12	30
Geometry Grp	1	1	1
Degree of Util (X)	0.043	0.014	0.029
Departure Headway (Hd)	3.902	4.094	3.46
Convergence, Y/N	Yes	Yes	Yes
Cap	921	876	1036
Service Time	1.912	2.11	1.476
HCM Lane V/C Ratio	0.043	0.014	0.029
HCM Control Delay	7.1	7.2	6.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0	0.1

Appendix P: Full Build (2043) Volumes – Scenarios 1, 2, and 3



FULL BUILD (2043) VOLUMES



Appendix Q: Full Build (2043) Synchro Analysis Worksheets – Scenarios 1, 2, and 3

Intersection	
Intersection Delay, s/veh	7.1
Intersection LOS	A

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	5	35	8	6	31	22
Future Vol, veh/h	5	38	8	6	34	22
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	4	6
Mvmt Flow	5	41	9	6	37	24
Number of Lanes	1	0	0	1	1	0

Approach	SE	NW	NE
Opposing Approach	NW	SE	
Opposing Lanes	1	1	0
Conflicting Approach Left		NE	SE
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NE		NW
Conflicting Lanes Right	1	0	1
HCM Control Delay	6.7	7.3	7.3
HCM LOS	A	A	A

Lane	NELn1	NWLn1	SELn1
Vol Left, %	61%	57%	0%
Vol Thru, %	0%	43%	12%
Vol Right, %	39%	0%	88%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	56	14	43
LT Vol	34	8	0
Through Vol	0	6	5
RT Vol	22	0	38
Lane Flow Rate	60	15	46
Geometry Grp	1	1	1
Degree of Util (X)	0.066	0.017	0.045
Departure Headway (Hd)	3.959	4.156	3.487
Convergence, Y/N	Yes	Yes	Yes
Cap	907	861	1025
Service Time	1.974	2.183	1.514
HCM Lane V/C Ratio	0.066	0.017	0.045
HCM Control Delay	7.3	7.3	6.7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.2	0.1	0.1

Intersection: 1: Audubon Rd. (CSAH 15) & Autumn Woods. Dr.

Movement	EB	NB
Directions Served	R	L
Maximum Queue (ft)	24	27
Average Queue (ft)	3	4
95th Queue (ft)	17	20
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	120	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	R	L	T	R	L	T	R
Maximum Queue (ft)	19	70	62	43	119	53	297	379	25
Average Queue (ft)	3	34	36	15	68	16	158	177	4
95th Queue (ft)	14	67	60	45	125	46	264	336	18
Link Distance (ft)	425				1116			802	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		130	130	242		242	230		230
Storage Blk Time (%)								6	
Queuing Penalty (veh)								18	

Intersection: 3: Ironwood Blvd. & Butternut Dr.

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)

Intersection: 4: Autumn Woods Dr. & Ironwood Blvd.

Movement	WB
Directions Served	LR
Maximum Queue (ft)	48
Average Queue (ft)	19
95th Queue (ft)	48
Link Distance (ft)	1147
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Acorn Rd. & Autumn Woods Dr.

Movement	SE	NW	NE
Directions Served	TR	LT	LR
Maximum Queue (ft)	31	49	49
Average Queue (ft)	26	16	33
95th Queue (ft)	44	47	44
Link Distance (ft)	540	381	1005
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Access A & Autumn Woods. Dr.

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)

Intersection: 7: Audubon Rd. (CSAH 15) & Access B

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)

Intersection: 22: Acorn Rd. & Pioneer Trail (Co. Rd. 14)

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	R	L	T	R	R	LTR
Maximum Queue (ft)	30	269	30	43	177	18	21	24
Average Queue (ft)	14	152	12	15	88	10	9	10
95th Queue (ft)	36	243	36	40	146	21	26	29
Link Distance (ft)		580			489		103	1005
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	180		230	275		275		
Storage Blk Time (%)		5						
Queuing Penalty (veh)		2						

Network Summary

Network wide Queuing Penalty: 20

Lanes, Volumes, Timings

2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

08/13/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	7	61	0	192	16	280	61	310	692	10
Future Volume (vph)	5	0	7	61	0	198	16	292	61	314	699	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	15	8	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	130		130	242		242	230		230
Storage Lanes	0		0	1		1	1		1	1		1
Taper Length (ft)	25			68			90			68		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99				0.98						
Frt		0.917				0.850			0.850			0.850
Flt Protected		0.981		0.950			0.950			0.950		
Satd. Flow (prot)	0	1679	0	1656	1900	1599	1543	1845	1509	1752	1881	1615
Flt Permitted		0.891		0.749			0.274			0.570		
Satd. Flow (perm)	0	1525	0	1306	1900	1565	445	1845	1509	1051	1881	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22				377			66			38
Link Speed (mph)		25			25			50			50	
Link Distance (ft)		495			305			1151			875	
Travel Time (s)		13.5			8.3			15.7			11.9	
Confl. Peds. (#/hr)						1						
Confl. Bikes (#/hr)			2									
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	17%	9%	0%	1%	17%	3%	7%	3%	1%	0%
Adj. Flow (vph)	5	0	8	66	0	213	17	314	66	338	752	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	13	0	66	0	213	17	314	66	338	752	18
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			20			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		8			8			8			8	
Two way Left Turn Lane												
Headway Factor	1.20	0.88	1.20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left						Left	Thru			Thru	Right
Leading Detector (ft)	20	156		6	156	6	20	100	6	6	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		6	6	6	20	6	6	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		150			150			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	

Scenario 1 - Future 2043 Scenario 1 - Future 2043 3:30 pm 06/23/2021

Synchro 11 Report
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Lanes, Volumes, Timings

2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

08/13/2021

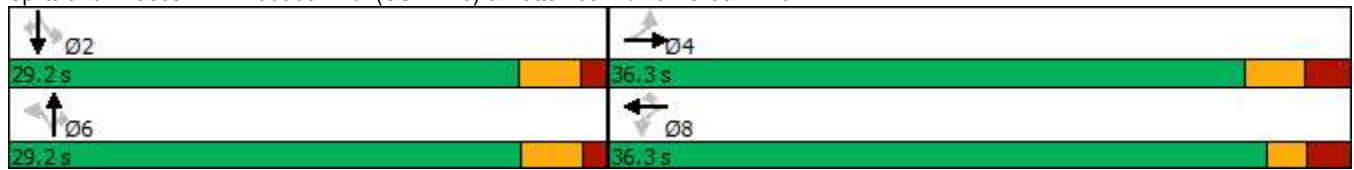
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm		Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			6			2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	6	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	12.0	12.0	12.0	12.0	12.0	12.0
Minimum Split (s)	36.3	36.3		34.2	34.2	34.2	29.2	29.2	29.2	28.3	28.3	28.3
Total Split (s)	36.3	36.3		36.3	36.3	36.3	29.2	29.2	29.2	29.2	29.2	29.2
Total Split (%)	55.4%	55.4%		55.4%	55.4%	55.4%	44.6%	44.6%	44.6%	44.6%	44.6%	44.6%
Yellow Time (s)	3.0	3.0		2.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.3	2.3		2.2	2.2	2.2	1.2	1.2	1.2	1.3	1.3	1.3
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.3		4.2	4.2	4.2	4.2	4.2	4.2	4.3	4.3	4.3
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)		7.3		8.4		8.4	28.1	28.1	28.1	28.0	28.0	28.0
Actuated g/C Ratio		0.16		0.19		0.19	0.62	0.62	0.62	0.62	0.62	0.62
v/c Ratio		0.05		0.27		0.36	0.06	0.27	0.07	0.52	0.64	0.02
Control Delay		6.5		17.4		1.8	4.3	4.7	1.5	8.6	8.8	0.9
Queue Delay		0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		6.5		17.4		1.8	4.3	4.7	1.5	8.6	8.8	0.9
LOS		A		B		A	A	A	A	A	A	A
Approach Delay		6.5			5.5			4.2			8.6	
Approach LOS		A			A			A			A	
Queue Length 50th (ft)		0		13		0	1	28	0	37	93	0
Queue Length 95th (ft)		8		37		3	7	58	9	94	189	3
Internal Link Dist (ft)		415			225			1071			795	
Turn Bay Length (ft)				130		130	242		242	230		230
Base Capacity (vph)		1072		945		1236	278	1151	966	653	1169	1018
Starvation Cap Reductn		0		0		0	0	0	0	0	0	0
Spillback Cap Reductn		0		0		0	0	0	0	0	0	0
Storage Cap Reductn		0		0		0	0	0	0	0	0	0
Reduced v/c Ratio		0.01		0.07		0.17	0.06	0.27	0.07	0.52	0.64	0.02
Intersection Summary												
Area Type:	Other											
Cycle Length: 65.5												
Actuated Cycle Length: 45												
Natural Cycle: 75												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.64												
Intersection Signal Delay: 7.1				Intersection LOS: A								
Intersection Capacity Utilization 64.6%				ICU Level of Service C								
Analysis Period (min) 15												

Lanes, Volumes, Timings

2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

08/13/2021

Splits and Phases: 2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.



Lanes, Volumes, Timings

22: Acorn Rd. & Pioneer Trail (Co. Rd. 14)

08/13/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	562	23	31	438	26	10	0	17	15	1	25
Future Volume (vph)	22	562	23	31	438	26	10	0	17	18	1	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	16	12	12	14	12
Storage Length (ft)	180		230	275		275	0		0	0		0
Storage Lanes	1		1	1		1	0		1	0		0
Taper Length (ft)	40			85			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.922	
Flt Protected	0.950			0.950				0.950			0.980	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	0	2006	1583	0	1795	0
Flt Permitted	0.335			0.187				0.726			0.922	
Satd. Flow (perm)	624	1863	1583	348	1863	1583	0	1533	1583	0	1689	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			51			51			51		27	
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		611			533			150			1082	
Travel Time (s)		9.3			8.1			4.1			29.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	24	604	25	33	471	28	11	0	18	19	1	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	604	25	33	471	28	0	11	18	0	47	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.92	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	0	2	1	0	2	
Detector Template							Thru			Thru		
Leading Detector (ft)	6	156	6	6	156	6	50	156	6	50	156	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	6	6	6	6	6	6	0	6	6	0	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		150			150			150			150	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		6			2			4			8	

Scenario 1 - Future 2043 Scenario 1 - Future 2043 3:30 pm 06/23/2021

Synchro 11 Report
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Lanes, Volumes, Timings
22: Acorn Rd. & Pioneer Trail (Co. Rd. 14)

08/13/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	6		6	2		2	4		4	8		
Detector Phase	6	6	6	2	2	2	4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	8.0	8.0	5.0	5.0	
Minimum Split (s)	25.8	25.8	25.8	30.1	30.1	30.1	34.5	34.5	34.5	24.1	24.1	
Total Split (s)	31.6	31.6	31.6	31.6	31.6	31.6	34.5	34.5	34.5	34.5	34.5	
Total Split (%)	47.8%	47.8%	47.8%	47.8%	47.8%	47.8%	52.2%	52.2%	52.2%	52.2%	52.2%	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.3	1.3	1.3	1.6	1.6	1.6	2.0	2.0	2.0	2.6	2.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Lost Time (s)	5.8	5.8	5.8	6.1	6.1	6.1		5.5	5.5		6.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max	
Act Effct Green (s)	25.8	25.8	25.8	25.5	25.5	25.5		29.0	29.0		28.4	
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.39	0.39		0.44	0.44		0.43	
v/c Ratio	0.10	0.83	0.04	0.25	0.66	0.04		0.02	0.02		0.06	
Control Delay	14.2	30.6	1.9	19.7	22.0	2.2		10.7	0.7		6.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	14.2	30.6	1.9	19.7	22.0	2.2		10.7	0.7		6.9	
LOS	B	C	A	B	C	A		B	A		A	
Approach Delay		28.9			20.8			4.5			6.9	
Approach LOS		C			C			A			A	
Queue Length 50th (ft)	6	213	0	9	152	0		2	0		4	
Queue Length 95th (ft)	20	#387	6	31	247	8		10	3		21	
Internal Link Dist (ft)		531			453			70			1002	
Turn Bay Length (ft)	180		230	275		275						
Base Capacity (vph)	243	727	648	134	718	642		672	723		741	
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	
Reduced v/c Ratio	0.10	0.83	0.04	0.25	0.66	0.04		0.02	0.02		0.06	

Intersection Summary

Area Type: Other

Cycle Length: 66.1

Actuated Cycle Length: 66.1

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 24.1

Intersection LOS: C

Intersection Capacity Utilization 54.9%

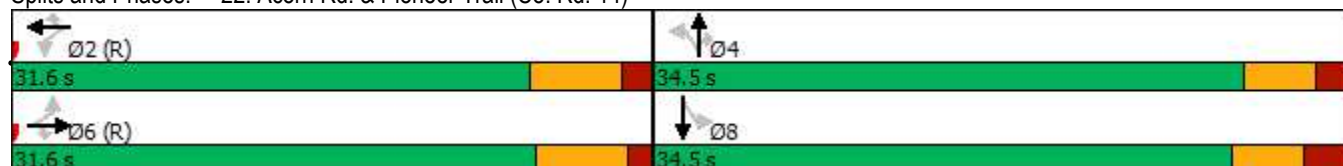
ICU Level of Service A

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 22: Acorn Rd. & Pioneer Trail (Co. Rd. 14)



Intersection

Int Delay, s/veh 1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	4	5	479	949	10
Future Vol, veh/h	29	12	23	479	949	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	120	-	-	195
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	14	0	25	2	1	0
Mvmt Flow	31	13	25	515	1020	52

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1585	1020	1072
Stage 1	1020	-	-
Stage 2	565	-	-
Critical Hdwy	6.54	6.2	4.35
Critical Hdwy Stg 1	5.54	-	-
Critical Hdwy Stg 2	5.54	-	-
Follow-up Hdwy	3.626	3.3	2.425
Pot Cap-1 Maneuver	112	290	571
Stage 1	331	-	-
Stage 2	546	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	107	290	571
Mov Cap-2 Maneuver	107	-	-
Stage 1	316	-	-
Stage 2	546	-	-

Approach	EB	NB	SB
HCM Control Delay, s	42	0.5	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	571	-	107	290	-	-
HCM Lane V/C Ratio	0.043	-	0.291	0.044	-	-
HCM Control Delay (s)	11.6	-	51.9	18	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	0.1	-	1.1	0.1	-	-

Intersection						
Int Delay, s/veh	2.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	3	17	20	3	23
Future Vol, veh/h	15	9	20	20	3	25
Conflicting Peds, #/hr	6	0	0	6	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	100	20	31	100	36
Mvmt Flow	16	10	22	22	3	27
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	78	39	0	0	50	0
Stage 1	39	-	-	-	-	-
Stage 2	39	-	-	-	-	-
Critical Hdwy	6.4	7.2	-	-	5.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	4.2	-	-	3.1	-
Pot Cap-1 Maneuver	930	811	-	-	1105	-
Stage 1	989	-	-	-	-	-
Stage 2	989	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	914	806	-	-	1098	-
Mov Cap-2 Maneuver	914	-	-	-	-	-
Stage 1	982	-	-	-	-	-
Stage 2	979	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.3	0		0.9		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-		870	1098	
HCM Lane V/C Ratio	-	-		0.03	0.003	
HCM Control Delay (s)	-	-		9.3	8.3	
HCM Lane LOS	-	-		A	A	
HCM 95th %tile Q(veh)	-	-		0.1	0	

Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Future Vol, veh/h	0	6	3	56	0	0	2	0	22	0	0	0
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	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	6	3	60	0	0	2	0	24	0	0	0
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	9	0	0	128	128	8	140	129	0
Stage 1	-	-	-	-	-	-	8	8	-	120	120	-
Stage 2	-	-	-	-	-	-	120	120	-	20	9	-
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	-	-	-	1611	-	-	845	763	1074	830	762	-
Stage 1	-	-	-	-	-	-	1013	889	-	884	796	-
Stage 2	-	-	-	-	-	-	884	796	-	999	888	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	1611	-	-	-	735	1074	789	734	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	735	-	789	734	-
Stage 1	-	-	-	-	-	-	1013	889	-	884	767	-
Stage 2	-	-	-	-	-	-	851	767	-	977	888	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			7.3						0		
HCM LOS							-			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	-	-	-	1611	-	-	-				
HCM Lane V/C Ratio	-	-	-	-	0.037	-	-	-				
HCM Control Delay (s)	-	0	-	-	7.3	0	-	0				
HCM Lane LOS	-	A	-	-	A	A	-	A				
HCM 95th %tile Q(veh)	-	-	-	-	0.1	-	-	-				

HCM 6th TWSC
7: Audubon Rd. (CSAH 15) & Access B

08/13/2021

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↗	↗	
Traffic Vol, veh/h	0	0	0	280	949	0
Future Vol, veh/h	0	10	0	298	957	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	11	0	320	1029	0
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1029	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	284	0	-	-	0
Stage 1	0	-	0	-	-	0
Stage 2	0	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	-	284	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay, s	18.2		0		0	
HCM LOS	C					
Minor Lane/Major Mvmt	NBT EBLn1		SBT			
Capacity (veh/h)	- 284		-			
HCM Lane V/C Ratio	- 0.038		-			
HCM Control Delay (s)	- 18.2		-			
HCM Lane LOS	- C		-			
HCM 95th %tile Q(veh)	- 0.1		-			

Lanes, Volumes, Timings
3: Ironwood Blvd. & Butternut Dr.

08/13/2021

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	24	0	1	22	0	0
Future Volume (vph)	31	0	1	22	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	8	14	8	8	14
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.870					
Flt Protected	0.950					
Satd. Flow (prot)	1735	0	1667	0	0	2027
Flt Permitted	0.950					
Satd. Flow (perm)	1735	0	1667	0	0	2027
Link Speed (mph)	25	25		25		
Link Distance (ft)	495	372		154		
Travel Time (s)	13.5	10.1		4.2		
Confl. Peds. (#/hr)	2			5		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	11%	0%	0%	6%	0%	0%
Adj. Flow (vph)	33	0	1	24	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	0	25	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	14	0		0		
Link Offset(ft)	0	0		0		
Crosswalk Width(ft)	16	16		16		
Two way Left Turn Lane						
Headway Factor	0.92	1.20	0.92	1.20	1.20	0.92
Turning Speed (mph)	15	9	9		15	
Sign Control	Free	Yield		Yield		
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	14.9%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection	
Intersection Delay, s/veh	7
Intersection LOS	A

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	5	35	8	6	31	22
Future Vol, veh/h	5	36	8	6	34	22
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	0	0	0	0	4	6
Mvmt Flow	5	36	8	6	34	22
Number of Lanes	1	0	0	1	1	0

Approach	SE	NW	NE
Opposing Approach	NW	SE	
Opposing Lanes	1	1	0
Conflicting Approach Left		NE	SE
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NE		NW
Conflicting Lanes Right	1	0	1
HCM Control Delay	6.7	7.2	7.2
HCM LOS	A	A	A

Lane	NELn1	NWLn1	SELn1
Vol Left, %	61%	57%	0%
Vol Thru, %	0%	43%	12%
Vol Right, %	39%	0%	88%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	56	14	41
LT Vol	34	8	0
Through Vol	0	6	5
RT Vol	22	0	36
Lane Flow Rate	56	14	41
Geometry Grp	1	1	1
Degree of Util (X)	0.061	0.016	0.04
Departure Headway (Hd)	3.947	4.144	3.481
Convergence, Y/N	Yes	Yes	Yes
Cap	909	864	1027
Service Time	1.963	2.169	1.507
HCM Lane V/C Ratio	0.062	0.016	0.04
HCM Control Delay	7.2	7.2	6.7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.2	0	0.1

Intersection: 1: Audubon Rd. (CSAH 15) & Autumn Woods. Dr.

Movement	EB	EB	NB
Directions Served	L	R	L
Maximum Queue (ft)	27	24	29
Average Queue (ft)	14	3	4
95th Queue (ft)	35	17	21
Link Distance (ft)	213	213	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			120
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	L	R	L	T	R	L	T
Maximum Queue (ft)	40	43	46	50	69	24	136	156
Average Queue (ft)	9	20	40	14	35	16	89	97
95th Queue (ft)	33	44	53	44	70	32	146	160
Link Distance (ft)	425				1116			802
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		130	130	242		242	230	
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 3: Ironwood Blvd. & Butternut Dr.

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)

Intersection: 4: Autumn Woods Dr. & Ironwood Blvd.

Movement	WB
Directions Served	LR
Maximum Queue (ft)	76
Average Queue (ft)	15
95th Queue (ft)	59
Link Distance (ft)	1147
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Acorn Rd. & Autumn Woods Dr.

Movement	SE	NW	NE
Directions Served	TR	LT	LR
Maximum Queue (ft)	31	32	31
Average Queue (ft)	22	9	26
95th Queue (ft)	45	32	44
Link Distance (ft)	540	381	1005
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Access A & Autumn Woods. Dr.

Movement	NB
Directions Served	LTR
Maximum Queue (ft)	29
Average Queue (ft)	12
95th Queue (ft)	35
Link Distance (ft)	150
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: Audubon Rd. (CSAH 15) & Access B

Movement	EB
Directions Served	R
Maximum Queue (ft)	30
Average Queue (ft)	8
95th Queue (ft)	30
Link Distance (ft)	169
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 22: Acorn Rd. & Pioneer Trail (CSAH. 14)/Pioneer Trail (CSAH 14)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	R	L	T	R	LT	R	LTR
Maximum Queue (ft)	51	309	31	45	195	14	25	21	24
Average Queue (ft)	21	166	12	24	130	4	7	3	10
95th Queue (ft)	52	290	36	41	191	13	26	15	29
Link Distance (ft)		580			489		103	103	1005
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	180		230	275		275			
Storage Blk Time (%)		7							
Queuing Penalty (veh)		3							

Network Summary

Network wide Queuing Penalty: 3

Lanes, Volumes, Timings

2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

08/11/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	7	61	0	192	16	280	61	310	692	10
Future Volume (vph)	7	1	9	61	6	192	28	280	61	312	697	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	15	8	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	130		130	242		242	230		230
Storage Lanes	0		0	1		1	1		1	1		1
Taper Length (ft)	25			68			90			68		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99				0.98						
Frt		0.929				0.850			0.850			0.850
Flt Protected		0.979		0.950			0.950			0.950		
Satd. Flow (prot)	0	1725	0	1656	1900	1599	1543	1845	1509	1752	1881	1615
Flt Permitted		0.885		0.745			0.265			0.577		
Satd. Flow (perm)	0	1559	0	1299	1900	1565	430	1845	1509	1064	1881	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10				206			66			47
Link Speed (mph)		25			25			50			50	
Link Distance (ft)		495			305			1151			875	
Travel Time (s)		13.5			8.3			15.7			11.9	
Confl. Peds. (#/hr)						1						
Confl. Bikes (#/hr)			2									
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	17%	9%	0%	1%	17%	3%	7%	3%	1%	0%
Adj. Flow (vph)	8	1	10	66	6	206	30	301	66	335	749	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	19	0	66	6	206	30	301	66	335	749	11
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			20			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		8			8			8			8	
Two way Left Turn Lane												
Headway Factor	1.20	0.88	1.20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left						Left	Thru			Thru	Right
Leading Detector (ft)	20	156		6	156	6	20	100	6	6	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		6	6	6	20	6	6	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		150			150			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	

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Lanes, Volumes, Timings

2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			6			2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	6	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	12.0	12.0	12.0	12.0	12.0	12.0
Minimum Split (s)	36.3	36.3		35.8	35.8	35.8	29.2	29.2	29.2	28.3	28.3	28.3
Total Split (s)	36.3	36.3		36.3	36.3	36.3	29.2	29.2	29.2	29.2	29.2	29.2
Total Split (%)	55.4%	55.4%		55.4%	55.4%	55.4%	44.6%	44.6%	44.6%	44.6%	44.6%	44.6%
Maximum Green (s)	31.0	31.0		30.5	30.5	30.5	25.0	25.0	25.0	24.9	24.9	24.9
Yellow Time (s)	3.0	3.0		3.6	3.6	3.6	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.3	2.3		2.2	2.2	2.2	1.2	1.2	1.2	1.3	1.3	1.3
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.3		5.8	5.8	5.8	4.2	4.2	4.2	4.3	4.3	4.3
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		2.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	Max	Max	Max	Max	Max	Max
Walk Time (s)	9.0	9.0		8.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0	22.0	16.0	16.0	16.0	17.0	17.0	17.0
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0	0	0	0	0
Act Effct Green (s)		8.3		7.8	7.8	7.8	27.8	27.8	27.8	27.7	27.7	27.7
Actuated g/C Ratio		0.18		0.17	0.17	0.17	0.61	0.61	0.61	0.60	0.60	0.60
v/c Ratio		0.07		0.30	0.02	0.47	0.11	0.27	0.07	0.52	0.66	0.01
Control Delay		11.1		18.9	14.2	7.0	5.8	5.3	1.8	9.4	10.1	0.1
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		11.1		18.9	14.2	7.0	5.8	5.3	1.8	9.4	10.1	0.1
LOS		B		B	B	A	A	A	A	A	B	A
Approach Delay		11.1			10.0			4.8			9.8	
Approach LOS		B			A			A			A	

Intersection Summary

Area Type: Other

Cycle Length: 65.5

Actuated Cycle Length: 45.8

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 8.7

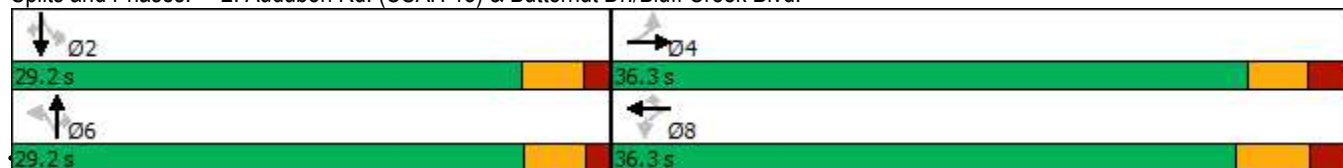
Intersection LOS: A

Intersection Capacity Utilization 65.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.



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Synchro 11 Report

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Lanes, Volumes, Timings

22: Acorn Rd. & Pioneer Trail (CSAH. 14)/Pioneer Trail (CSAH 14)

08/11/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	562	23	31	438	26	10	0	17	15	1	25
Future Volume (vph)	22	562	23	31	438	26	10	0	17	15	1	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	16	12	12	14	12
Storage Length (ft)	180		230	275		275	0		0	0		0
Storage Lanes	1		1	1		1	0		1	0		0
Taper Length (ft)	40			85			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr't			0.850			0.850			0.850		0.916	
Flt Protected	0.950			0.950				0.950			0.983	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	0	2006	1583	0	1789	0
Flt Permitted	0.329			0.180				0.728			0.934	
Satd. Flow (perm)	613	1863	1583	335	1863	1583	0	1537	1583	0	1700	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			51			51			51		28	
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		611			533			150			1082	
Travel Time (s)		9.3			8.1			4.1			29.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	611	25	34	476	28	11	0	18	16	1	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	611	25	34	476	28	0	11	18	0	45	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.92	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	0	2	1	0	2	
Detector Template							Thru			Thru		
Leading Detector (ft)	6	156	6	6	156	6	50	156	6	50	156	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	6	6	6	6	6	6	0	6	6	0	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		150			150			150			150	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		6			2			4			8	

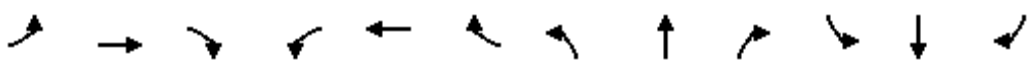
Scenario 2 - Future 2043 Scenario 2 - Future 2043 3:30 pm 06/23/2021

Synchro 11 Report
Page 9

Lanes, Volumes, Timings

22: Acorn Rd. & Pioneer Trail (CSAH. 14)/Pioneer Trail (CSAH 14)

08/11/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	6		6	2		2	4		4	8		
Detector Phase	6	6	6	2	2	2	4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	8.0	8.0	5.0	5.0	
Minimum Split (s)	25.8	25.8	25.8	30.1	30.1	30.1	34.5	34.5	34.5	24.1	24.1	
Total Split (s)	31.6	31.6	31.6	31.6	31.6	31.6	34.5	34.5	34.5	34.4	34.4	
Total Split (%)	47.8%	47.8%	47.8%	47.8%	47.8%	47.8%	52.2%	52.2%	52.2%	52.0%	52.0%	
Maximum Green (s)	25.8	25.8	25.8	25.5	25.5	25.5	29.0	29.0	29.0	28.3	28.3	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.3	1.3	1.3	1.6	1.6	1.6	2.0	2.0	2.0	2.6	2.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Lost Time (s)	5.8	5.8	5.8	6.1	6.1	6.1		5.5	5.5		6.1	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max	
Walk Time (s)				7.0	7.0	7.0	7.0	7.0	7.0			
Flash Dont Walk (s)				17.0	17.0	17.0	22.0	22.0	22.0			
Pedestrian Calls (#/hr)				0	0	0	0	0	0			
Act Effect Green (s)	25.8	25.8	25.8	25.5	25.5	25.5		29.0	29.0		28.4	
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.39	0.39		0.44	0.44		0.43	
v/c Ratio	0.10	0.84	0.04	0.26	0.66	0.04		0.02	0.02		0.06	
Control Delay	14.3	31.4	1.9	20.5	22.2	2.2		10.7	0.7		6.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	14.3	31.4	1.9	20.5	22.2	2.2		10.7	0.7		6.6	
LOS	B	C	A	C	C	A		B	A		A	
Approach Delay		29.6			21.1			4.5			6.6	
Approach LOS		C			C			A			A	

Intersection Summary

Area Type: Other

Cycle Length: 66.1

Actuated Cycle Length: 66.1

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 24.6

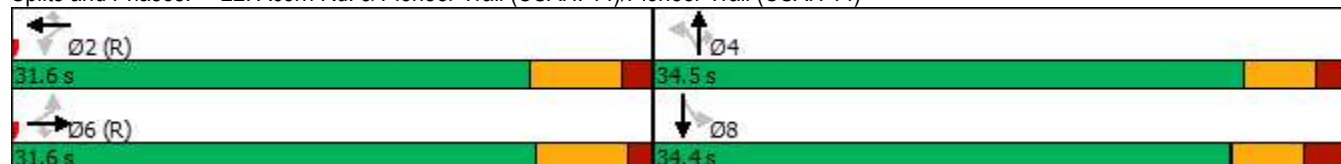
Intersection LOS: C

Intersection Capacity Utilization 54.9%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 22: Acorn Rd. & Pioneer Trail (CSAH. 14)/Pioneer Trail (CSAH 14)



Intersection

Int Delay, s/veh 1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	4	5	479	949	10
Future Vol, veh/h	29	4	5	481	949	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	120	-	-	195
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	14	0	25	2	1	0
Mvmt Flow	31	4	5	517	1020	52

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1547	1020	1072
Stage 1	1020	-	-
Stage 2	527	-	-
Critical Hdwy	6.54	6.2	4.35
Critical Hdwy Stg 1	5.54	-	-
Critical Hdwy Stg 2	5.54	-	-
Follow-up Hdwy	3.626	3.3	2.425
Pot Cap-1 Maneuver	118	290	571
Stage 1	331	-	-
Stage 2	569	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	117	290	571
Mov Cap-2 Maneuver	117	-	-
Stage 1	328	-	-
Stage 2	569	-	-

Approach	EB	NB	SB
HCM Control Delay, s	43.1	0.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	571	-	117	290	-	-
HCM Lane V/C Ratio	0.009	-	0.267	0.015	-	-
HCM Control Delay (s)	11.4	-	46.6	17.6	-	-
HCM Lane LOS	B	-	E	C	-	-
HCM 95th %tile Q(veh)	0	-	1	0	-	-

Intersection

Int Delay, s/veh 2.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	3	17	20	3	23
Future Vol, veh/h	15	3	17	23	3	23
Conflicting Peds, #/hr	6	0	0	6	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	70	75	85	63	75	72
Heavy Vehicles, %	0	100	20	31	100	36
Mvmt Flow	21	4	20	37	4	32

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	91	45	0
Stage 1	45	-	-
Stage 2	46	-	-
Critical Hdwy	6.4	7.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	4.2	-
Pot Cap-1 Maneuver	914	804	-
Stage 1	983	-	-
Stage 2	982	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	898	799	-
Mov Cap-2 Maneuver	898	-	-
Stage 1	976	-	-
Stage 2	971	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.2	0	0.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	881	1084
HCM Lane V/C Ratio	-	-	0.029	0.004
HCM Control Delay (s)	-	-	9.2	8.3
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Intersection												
Int Delay, s/veh	4.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	38	0	0	0	0	20	0	0	0
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	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	0	0	0	41	0	0	0	0	22	0	0	0
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	1	0	0	83	83	1	94	83	0
Stage 1	-	-	-	-	-	-	1	1	-	82	82	-
Stage 2	-	-	-	-	-	-	82	82	-	12	1	-
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	-	-	-	1622	-	-	904	807	1084	889	807	-
Stage 1	-	-	-	-	-	-	1022	895	-	926	827	-
Stage 2	-	-	-	-	-	-	926	827	-	1009	895	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	1622	-	-	-	787	1084	854	787	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	787	-	854	787	-
Stage 1	-	-	-	-	-	-	1022	895	-	926	806	-
Stage 2	-	-	-	-	-	-	903	806	-	989	895	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			7.3						0		
HCM LOS							-			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	-	-	-	1622	-	-	-				
HCM Lane V/C Ratio	-	-	-	-	0.025	-	-	-				
HCM Control Delay (s)	-	0	-	-	7.3	0	-	0				
HCM Lane LOS	-	A	-	-	A	A	-	A				
HCM 95th %tile Q(veh)	-	-	-	-	0.1	-	-	-				

HCM 6th TWSC
7: Audubon Rd. (CSAH 15) & Access B

08/11/2021

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↗	↗	
Traffic Vol, veh/h	0	0	0	280	949	0
Future Vol, veh/h	0	7	0	282	949	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	8	0	307	1032	0
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1032	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	283	0	-	-	0
Stage 1	0	-	0	-	-	0
Stage 2	0	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	-	283	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay, s	18.1		0		0	
HCM LOS	C					
Minor Lane/Major Mvmt	NBT EBLn1		SBT			
Capacity (veh/h)	- 283		-			
HCM Lane V/C Ratio	- 0.027		-			
HCM Control Delay (s)	- 18.1		-			
HCM Lane LOS	- C		-			
HCM 95th %tile Q(veh)	- 0.1		-			

Lanes, Volumes, Timings
3: Ironwood Blvd. & Butternut Dr.

08/11/2021

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	24	0	1	22	0	0
Future Volume (vph)	24	18	4	22	5	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	8	14	8	8	14
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.951		0.910			
Flt Protected	0.969					0.960
Satd. Flow (prot)	1745	0	1773	0	0	1946
Flt Permitted	0.969					0.960
Satd. Flow (perm)	1745	0	1773	0	0	1946
Link Speed (mph)	25		25			25
Link Distance (ft)	495		372			154
Travel Time (s)	13.5		10.1			4.2
Confl. Peds. (#/hr)	2			5		
Peak Hour Factor	0.75	1.00	0.25	0.69	1.00	1.00
Heavy Vehicles (%)	11%	0%	0%	6%	0%	0%
Adj. Flow (vph)	32	18	16	32	5	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	0	48	0	0	6
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	14		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	0.92	1.20	0.92	1.20	1.20	0.92
Turning Speed (mph)	15	9		9	15	
Sign Control	Free		Yield			Yield
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	14.9%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection	
Intersection Delay, s/veh	7.1
Intersection LOS	A

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	5	35	8	6	31	22
Future Vol, veh/h	5	36	8	6	34	22
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	0	0	0	0	4	6
Mvmt Flow	5	39	9	6	37	24
Number of Lanes	1	0	0	1	1	0

Approach	SE	NW	NE
Opposing Approach	NW	SE	
Opposing Lanes	1	1	0
Conflicting Approach Left		NE	SE
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NE		NW
Conflicting Lanes Right	1	0	1
HCM Control Delay	6.7	7.3	7.3
HCM LOS	A	A	A

Lane	NELn1	NWLn1	SELn1
Vol Left, %	61%	57%	0%
Vol Thru, %	0%	43%	12%
Vol Right, %	39%	0%	88%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	56	14	41
LT Vol	34	8	0
Through Vol	0	6	5
RT Vol	22	0	36
Lane Flow Rate	60	15	44
Geometry Grp	1	1	1
Degree of Util (X)	0.066	0.017	0.043
Departure Headway (Hd)	3.955	4.154	3.49
Convergence, Y/N	Yes	Yes	Yes
Cap	907	861	1024
Service Time	1.97	2.182	1.517
HCM Lane V/C Ratio	0.066	0.017	0.043
HCM Control Delay	7.3	7.3	6.7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.2	0.1	0.1

Intersection: 1: Audubon Rd. (CSAH 15) & Autumn Woods. Dr.

Movement	EB	EB	NB
Directions Served	L	R	L
Maximum Queue (ft)	48	24	26
Average Queue (ft)	25	10	7
95th Queue (ft)	61	29	26
Link Distance (ft)	213	213	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			120
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

Movement	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	L	T	R	L	T	R	L	T
Maximum Queue (ft)	62	69	23	43	50	96	40	159	138
Average Queue (ft)	20	25	3	29	24	64	19	102	78
95th Queue (ft)	57	59	17	46	59	97	41	159	148
Link Distance (ft)	425		267			1116			806
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		130		130	242		242	230	
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 3: Ironwood Blvd. & Butternut Dr.

Movement	NB
Directions Served	TR
Maximum Queue (ft)	49
Average Queue (ft)	7
95th Queue (ft)	36
Link Distance (ft)	304
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Autumn Woods Dr. & Ironwood Blvd.

Movement	WB
Directions Served	LR
Maximum Queue (ft)	53
Average Queue (ft)	12
95th Queue (ft)	44
Link Distance (ft)	1147
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Acorn Rd. & Autumn Woods Dr.

Movement	SE	NW	NE
Directions Served	TR	LT	LR
Maximum Queue (ft)	31	31	56
Average Queue (ft)	26	13	37
95th Queue (ft)	43	37	54
Link Distance (ft)	540	381	1005
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Autumn Woods. Dr.

Movement	NB
Directions Served	LTR
Maximum Queue (ft)	29
Average Queue (ft)	8
95th Queue (ft)	30
Link Distance (ft)	150
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 22: Acorn Rd. & Pioneer Trail (Co. Rd. 14)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	R	L	T	R	LT	R	LTR
Maximum Queue (ft)	219	247	53	25	384	15	25	21	24
Average Queue (ft)	45	177	16	20	139	7	9	6	10
95th Queue (ft)	163	250	48	34	260	17	27	21	28
Link Distance (ft)		580			489		103	103	1005
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	180		230	275		275			
Storage Blk Time (%)		6			3				
Queuing Penalty (veh)		3			2				

Network Summary

Network wide Queuing Penalty: 5

Lanes, Volumes, Timings

2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

09/03/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	7	61	0	192	16	280	61	310	692	10
Future Volume (vph)	19	4	14	61	6	192	28	280	61	310	692	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	15	8	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	130		130	242		242	230		230
Storage Lanes	0		0	1		1	1		1	1		1
Taper Length (ft)	25			68			90			68		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99				0.98						
Frt		0.948				0.850			0.850			0.850
Flt Protected		0.975		0.950			0.950			0.950		
Satd. Flow (prot)	0	1798	0	1656	1900	1599	1543	1845	1509	1752	1881	1615
Flt Permitted		0.846		0.732			0.267			0.577		
Satd. Flow (perm)	0	1560	0	1276	1900	1565	434	1845	1509	1064	1881	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15				206			66			47
Link Speed (mph)		25			25			50			50	
Link Distance (ft)		495			305			1151			875	
Travel Time (s)		13.5			8.3			15.7			11.9	
Confl. Peds. (#/hr)						1						
Confl. Bikes (#/hr)			2									
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	17%	9%	0%	1%	17%	3%	7%	3%	1%	0%
Adj. Flow (vph)	20	4	15	66	6	206	30	301	66	333	744	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	39	0	66	6	206	30	301	66	333	744	37
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			20			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		8			8			8			8	
Two way Left Turn Lane												
Headway Factor	1.20	0.88	1.20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left						Left	Thru			Thru	Right
Leading Detector (ft)	20	156		6	156	6	20	100	6	6	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		6	6	6	20	6	6	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		150			150			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	

Scenario 3 - Future 2043 Scenario 3 - Future 2043 3:30 pm 06/23/2021

Synchro 11 Report
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Lanes, Volumes, Timings

2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

09/03/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			6			2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	6	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	12.0	12.0	12.0	12.0	12.0	12.0
Minimum Split (s)	36.3	36.3		35.8	35.8	35.8	29.2	29.2	29.2	28.3	28.3	28.3
Total Split (s)	36.3	36.3		36.3	36.3	36.3	29.2	29.2	29.2	29.2	29.2	29.2
Total Split (%)	55.4%	55.4%		55.4%	55.4%	55.4%	44.6%	44.6%	44.6%	44.6%	44.6%	44.6%
Maximum Green (s)	31.0	31.0		30.5	30.5	30.5	25.0	25.0	25.0	24.9	24.9	24.9
Yellow Time (s)	3.0	3.0		3.6	3.6	3.6	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.3	2.3		2.2	2.2	2.2	1.2	1.2	1.2	1.3	1.3	1.3
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.3		5.8	5.8	5.8	4.2	4.2	4.2	4.3	4.3	4.3
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		2.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	Max	Max	Max	Max	Max	Max
Walk Time (s)	9.0	9.0		8.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0	22.0	16.0	16.0	16.0	17.0	17.0	17.0
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0	0	0	0	0
Act Effct Green (s)		8.4		7.9	7.9	7.9	27.8	27.8	27.8	27.7	27.7	27.7
Actuated g/C Ratio		0.18		0.17	0.17	0.17	0.61	0.61	0.61	0.60	0.60	0.60
v/c Ratio		0.13		0.30	0.02	0.47	0.11	0.27	0.07	0.52	0.65	0.04
Control Delay		11.8		19.0	14.2	7.0	5.8	5.3	1.8	9.4	10.1	1.7
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		11.8		19.0	14.2	7.0	5.8	5.3	1.8	9.4	10.1	1.7
LOS		B		B	B	A	A	A	A	A	B	A
Approach Delay		11.8			10.0			4.8			9.6	
Approach LOS		B			A			A			A	
Queue Length 50th (ft)		5		14	1	0	2	28	0	37	95	0
Queue Length 95th (ft)		22		39	8	38	13	68	11	110	227	7
Internal Link Dist (ft)		415			225			1071			795	
Turn Bay Length (ft)				130		130	242		242	230		230
Base Capacity (vph)		1076		862	1283	1124	263	1118	940	642	1136	994
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.04		0.08	0.00	0.18	0.11	0.27	0.07	0.52	0.65	0.04
Intersection Summary												
Area Type:	Other											
Cycle Length: 65.5												
Actuated Cycle Length: 45.8												
Natural Cycle: 75												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.65												

Scenario 3 - Future 2043 Scenario 3 - Future 2043 3:30 pm 06/23/2021

Synchro 11 Report
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Lanes, Volumes, Timings

2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

09/03/2021

Intersection Signal Delay: 8.6

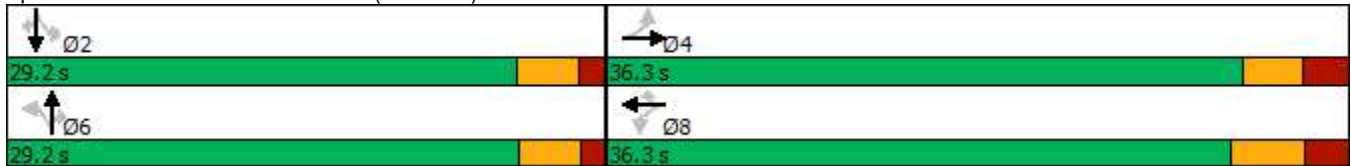
Intersection LOS: A

Intersection Capacity Utilization 65.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.



Lanes, Volumes, Timings

22: Acorn Rd. & Pioneer Trail (Co. Rd. 14)

09/03/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	562	23	31	438	26	10	0	17	15	1	25
Future Volume (vph)	22	562	23	31	438	26	10	0	17	15	1	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	16	12	12	14	12
Storage Length (ft)	180		230	275		275	0		0	0		0
Storage Lanes	1		1	1		1	0		1	0		0
Taper Length (ft)	40			85			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frnt			0.850			0.850			0.850		0.916	
Flt Protected	0.950			0.950				0.950			0.983	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	0	2006	1583	0	1789	0
Flt Permitted	0.335			0.187				0.728			0.934	
Satd. Flow (perm)	624	1863	1583	348	1863	1583	0	1537	1583	0	1700	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			51			51			51		28	
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		611			533			150			1082	
Travel Time (s)		9.3			8.1			4.1			29.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	24	604	25	33	471	28	11	0	18	16	1	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	604	25	33	471	28	0	11	18	0	45	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.92	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	0	2	1	0	2	
Detector Template							Thru			Thru		
Leading Detector (ft)	6	156	6	6	156	6	50	156	6	50	156	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	6	6	6	6	6	6	0	6	6	0	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		150			150			150			150	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		6			2			4			8	

Scenario 3 - Future 2043 Scenario 3 - Future 2043 3:30 pm 06/23/2021

Synchro 11 Report

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Lanes, Volumes, Timings
22: Acorn Rd. & Pioneer Trail (Co. Rd. 14)

09/03/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	6		6	2		2	4		4	8		
Detector Phase	6	6	6	2	2	2	4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	8.0	8.0	5.0	5.0	
Minimum Split (s)	25.8	25.8	25.8	30.1	30.1	30.1	34.5	34.5	34.5	24.1	24.1	
Total Split (s)	31.6	31.6	31.6	31.6	31.6	31.6	34.5	34.5	34.5	34.4	34.4	
Total Split (%)	47.8%	47.8%	47.8%	47.8%	47.8%	47.8%	52.2%	52.2%	52.2%	52.0%	52.0%	
Maximum Green (s)	25.8	25.8	25.8	25.5	25.5	25.5	29.0	29.0	29.0	28.3	28.3	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.3	1.3	1.3	1.6	1.6	1.6	2.0	2.0	2.0	2.6	2.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Lost Time (s)	5.8	5.8	5.8	6.1	6.1	6.1		5.5	5.5		6.1	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max	
Walk Time (s)				7.0	7.0	7.0	7.0	7.0	7.0			
Flash Dont Walk (s)				17.0	17.0	17.0	22.0	22.0	22.0			
Pedestrian Calls (#/hr)				0	0	0	0	0	0			
Act Effct Green (s)	25.8	25.8	25.8	25.5	25.5	25.5		29.0	29.0		28.4	
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.39	0.39		0.44	0.44		0.43	
v/c Ratio	0.10	0.83	0.04	0.25	0.66	0.04		0.02	0.02		0.06	
Control Delay	14.2	30.6	1.9	19.7	22.0	2.2		10.7	0.7		6.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	14.2	30.6	1.9	19.7	22.0	2.2		10.7	0.7		6.6	
LOS	B	C	A	B	C	A		B	A		A	
Approach Delay		28.9			20.8			4.5			6.6	
Approach LOS		C			C			A			A	
Queue Length 50th (ft)	6	213	0	9	152	0		2	0		4	
Queue Length 95th (ft)	20	#387	6	31	247	8		10	3		20	
Internal Link Dist (ft)		531			453			70			1002	
Turn Bay Length (ft)	180		230	275		275						
Base Capacity (vph)	243	727	648	134	718	642		674	723		746	
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	
Reduced v/c Ratio	0.10	0.83	0.04	0.25	0.66	0.04		0.02	0.02		0.06	
Intersection Summary												
Area Type:	Other											
Cycle Length:	66.1											
Actuated Cycle Length:	66.1											
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green												
Natural Cycle: 65												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.83												
Intersection Signal Delay: 24.1						Intersection LOS: C						
Intersection Capacity Utilization 54.9%						ICU Level of Service A						
Analysis Period (min) 15												

Scenario 3 - Future 2043 Scenario 3 - Future 2043 3:30 pm 06/23/2021

Synchro 11 Report
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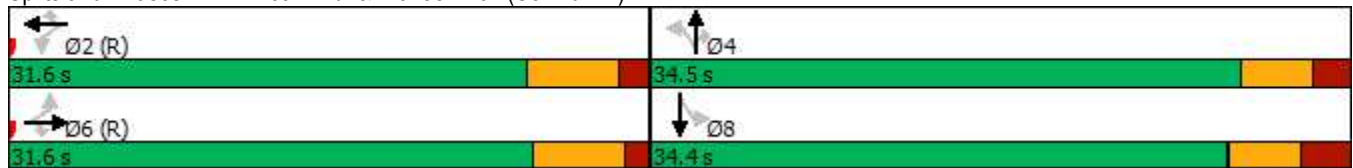
Lanes, Volumes, Timings

22: Acorn Rd. & Pioneer Trail (Co. Rd. 14)

09/03/2021

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

Splits and Phases: 22: Acorn Rd. & Pioneer Trail (Co. Rd. 14)



Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	4	5	479	949	10
Future Vol, veh/h	18	4	5	493	973	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	120	-	-	195
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	14	0	25	2	1	0
Mvmt Flow	19	4	5	530	1046	27
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1586	1046	1073	0	-	0
Stage 1	1046	-	-	-	-	-
Stage 2	540	-	-	-	-	-
Critical Hdwy	6.54	6.2	4.35	-	-	-
Critical Hdwy Stg 1	5.54	-	-	-	-	-
Critical Hdwy Stg 2	5.54	-	-	-	-	-
Follow-up Hdwy	3.626	3.3	2.425	-	-	-
Pot Cap-1 Maneuver	111	280	570	-	-	-
Stage 1	321	-	-	-	-	-
Stage 2	561	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	110	280	570	-	-	-
Mov Cap-2 Maneuver	110	-	-	-	-	-
Stage 1	318	-	-	-	-	-
Stage 2	561	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	39.8	0.1		0		
HCM LOS	E					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	570	-	110	280	-	-
HCM Lane V/C Ratio	0.009	-	0.176	0.015	-	-
HCM Control Delay (s)	11.4	-	44.6	18.1	-	-
HCM Lane LOS	B	-	E	C	-	-
HCM 95th %tile Q(veh)	0	-	0.6	0	-	-

Intersection						
Int Delay, s/veh	2.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	3	17	20	3	23
Future Vol, veh/h	15	3	17	23	3	23
Conflicting Peds, #/hr	6	0	0	6	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	100	20	31	100	36
Mvmt Flow	16	3	18	25	3	25
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	74	37	0	0	49	0
Stage 1	37	-	-	-	-	-
Stage 2	37	-	-	-	-	-
Critical Hdwy	6.4	7.2	-	-	5.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	4.2	-	-	3.1	-
Pot Cap-1 Maneuver	935	813	-	-	1106	-
Stage 1	991	-	-	-	-	-
Stage 2	991	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	919	808	-	-	1099	-
Mov Cap-2 Maneuver	919	-	-	-	-	-
Stage 1	984	-	-	-	-	-
Stage 2	981	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.1	0		1		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	898		1099	-	
HCM Lane V/C Ratio	-	0.022		0.003	-	
HCM Control Delay (s)	-	9.1		8.3	0	
HCM Lane LOS	-	A		A	A	
HCM 95th %tile Q(veh)	-	0.1		0	-	

Intersection												
Int Delay, s/veh	4.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	15	0	0	0	0	9	0	0	0
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	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	16	0	0	0	0	10	0	0	0
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	1	0	0	33	33	1	38	33	0
Stage 1	-	-	-	-	-	-	1	1	-	32	32	-
Stage 2	-	-	-	-	-	-	32	32	-	6	1	-
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	-	-	-	1622	-	-	974	860	1084	967	860	-
Stage 1	-	-	-	-	-	-	1022	895	-	984	868	-
Stage 2	-	-	-	-	-	-	984	868	-	1016	895	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	1622	-	-	-	851	1084	952	851	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	851	-	952	851	-
Stage 1	-	-	-	-	-	-	1022	895	-	984	859	-
Stage 2	-	-	-	-	-	-	974	859	-	1007	895	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			7.2						0		
HCM LOS							-			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	-	-	-	1622	-	-	-				
HCM Lane V/C Ratio	-	-	-	-	0.01	-	-	-				
HCM Control Delay (s)	-	0	-	-	7.2	0	-	0				
HCM Lane LOS	-	A	-	-	A	A	-	A				
HCM 95th %tile Q(veh)	-	-	-	-	0	-	-	-				

Lanes, Volumes, Timings

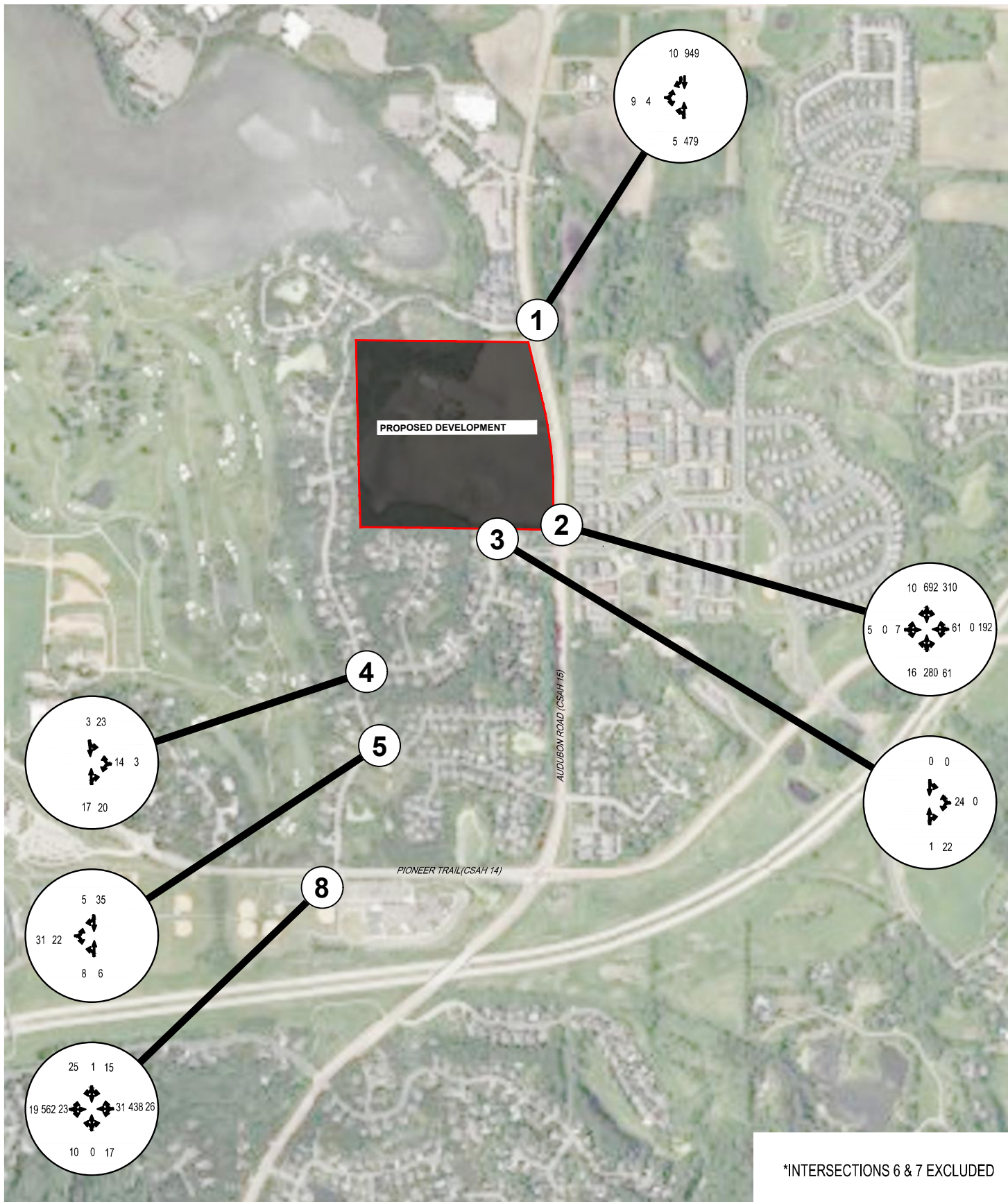
3: Ironwood Blvd. & Butternut Dr.

09/03/2021



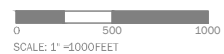
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	24	0	1	22	0	0
Future Volume (vph)	24	42	4	22	25	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	8	14	8	8	14
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.914		0.884			
Flt Protected	0.982					0.954
Satd. Flow (prot)	1749	0	1704	0	0	1933
Flt Permitted	0.982					0.954
Satd. Flow (perm)	1749	0	1704	0	0	1933
Link Speed (mph)	25		25			25
Link Distance (ft)	495		372			154
Travel Time (s)	13.5		10.1			4.2
Confl. Peds. (#/hr)	2			5		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	11%	0%	0%	6%	0%	0%
Adj. Flow (vph)	26	45	4	24	27	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	71	0	28	0	0	28
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	14		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	0.92	1.20	0.92	1.20	1.20	0.92
Turning Speed (mph)	15	9		9	15	
Sign Control	Free		Yield			Yield
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 14.9%			ICU Level of Service A			
Analysis Period (min) 15						

Appendix R: No Build (2043) Volumes



*INTERSECTIONS 6 & 7 EXCLUDED

NO BUILD (2043) VOLUMES



Appendix S: No Build (2043) Synchro Analysis Worksheets

Lanes, Volumes, Timings

2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

06/29/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	5	0	7	61	0	192	16	280	61	310	692	10
Future Volume (vph)	5	0	7	61	0	192	16	280	61	310	692	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	15	8	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	130		130	242		242	230		230
Storage Lanes	0		0	1		1	1		1	1		1
Taper Length (ft)	25			68			90			68		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99				0.98						
Frt		0.925				0.850			0.850			0.850
Flt Protected		0.978		0.950			0.950			0.950		
Satd. Flow (prot)	0	1707	0	1656	1900	1599	1543	1845	1509	1752	1881	1615
Flt Permitted		0.871		0.734			0.173			0.509		
Satd. Flow (perm)	0	1520	0	1279	1900	1565	281	1845	1509	939	1881	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22				279			95			47
Link Speed (mph)		25			25			50			50	
Link Distance (ft)		495			305			1151			1689	
Travel Time (s)		13.5			8.3			15.7			23.0	
Confl. Peds. (#/hr)						1						
Confl. Bikes (#/hr)			2									
Peak Hour Factor	0.31	1.00	0.35	0.76	1.00	0.77	0.50	0.70	0.64	0.79	0.78	0.50
Heavy Vehicles (%)	0%	0%	17%	9%	0%	1%	17%	3%	7%	3%	1%	0%
Adj. Flow (vph)	16	0	20	80	0	249	32	400	95	392	887	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	0	80	0	249	32	400	95	392	887	20
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			20			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		8			8			8			8	
Two way Left Turn Lane												
Headway Factor	1.20	0.88	1.20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left						Left	Thru			Thru	Right
Leading Detector (ft)	20	156		6	156	6	20	100	6	6	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		6	6	6	20	6	6	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		150			150			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	

2043 No Build 2043 No Build 3:30 pm 06/23/2021

Synchro 11 Report
Page 2

Lanes, Volumes, Timings

2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

06/29/2021

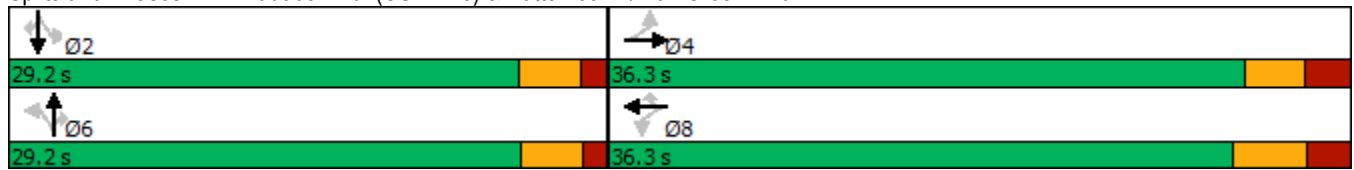
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm		Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			6			2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	6	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	12.0	12.0	12.0	12.0	12.0	12.0
Minimum Split (s)	36.3	36.3		35.8	35.8	35.8	29.2	29.2	29.2	28.3	28.3	28.3
Total Split (s)	36.3	36.3		36.3	36.3	36.3	29.2	29.2	29.2	29.2	29.2	29.2
Total Split (%)	55.4%	55.4%		55.4%	55.4%	55.4%	44.6%	44.6%	44.6%	44.6%	44.6%	44.6%
Yellow Time (s)	3.0	3.0		3.6	3.6	3.6	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.3	2.3		2.2	2.2	2.2	1.2	1.2	1.2	1.3	1.3	1.3
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.3		5.8	5.8	5.8	4.2	4.2	4.2	4.3	4.3	4.3
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)		8.4		7.9		7.9	27.2	27.2	27.2	27.1	27.1	27.1
Actuated g/C Ratio		0.19		0.17		0.17	0.60	0.60	0.60	0.60	0.60	0.60
v/c Ratio		0.12		0.36		0.49	0.19	0.36	0.10	0.70	0.79	0.02
Control Delay		10.1		20.1		5.8	8.1	6.1	1.7	16.9	15.2	0.9
Queue Delay		0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		10.1		20.1		5.8	8.1	6.1	1.7	16.9	15.2	0.9
LOS		B		C		A	A	A	A	B	B	A
Approach Delay		10.1			9.3			5.4			15.5	
Approach LOS		B			A			A			B	
Queue Length 50th (ft)		3		17		0	3	39	0	52	130	0
Queue Length 95th (ft)		19		37		20	7	64	6	#136	226	0
Internal Link Dist (ft)		415			225			1071			1609	
Turn Bay Length (ft)				130		130	242		242	230		230
Base Capacity (vph)		1057		869		1153	169	1110	946	563	1128	987
Starvation Cap Reductn		0		0		0	0	0	0	0	0	0
Spillback Cap Reductn		0		0		0	0	0	0	0	0	0
Storage Cap Reductn		0		0		0	0	0	0	0	0	0
Reduced v/c Ratio		0.03		0.09		0.22	0.19	0.36	0.10	0.70	0.79	0.02
Intersection Summary												
Area Type:	Other											
Cycle Length: 65.5												
Actuated Cycle Length: 45.2												
Natural Cycle: 90												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.79												
Intersection Signal Delay: 12.0				Intersection LOS: B								
Intersection Capacity Utilization 65.9%				ICU Level of Service C								
Analysis Period (min) 15												
# 95th percentile volume exceeds capacity, queue may be longer.												
Queue shown is maximum after two cycles.												

Lanes, Volumes, Timings

2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.

06/29/2021

Splits and Phases: 2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.



Lanes, Volumes, Timings
7: Acorn Rd. & Pioneer Trail (Co. Rd. 14)

06/29/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	562	23	31	438	26	10	0	17	25	1	15
Future Volume (vph)	19	562	23	31	438	26	10	0	17	25	1	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	16	12	12	14	12
Storage Length (ft)	180		230	275		275	0		0	0		0
Storage Lanes	1		1	1		1	0		1	0		0
Taper Length (ft)	40			85			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.951	
Flt Protected	0.950			0.950				0.950			0.970	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	0	2006	1583	0	1833	0
Flt Permitted	0.329			0.180				0.728			0.876	
Satd. Flow (perm)	613	1863	1583	335	1863	1583	0	1537	1583	0	1655	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			51			51			51		16	
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		611			533			150			1082	
Travel Time (s)		9.3			8.1			4.1			29.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	611	25	34	476	28	11	0	18	27	1	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	611	25	34	476	28	0	11	18	0	44	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.92	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	0	2	1	0	1	
Detector Template							Thru			Thru		
Leading Detector (ft)	6	156	6	6	156	6	50	156	6	50	6	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	6	6	6	6	6	6	0	6	6	0	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		150			150			150				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		6			2			4			8	

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Synchro 11 Report
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Lanes, Volumes, Timings
7: Acorn Rd. & Pioneer Trail (Co. Rd. 14)

06/29/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	6		6	2		2	4		4	8		
Detector Phase	6	6	6	2	2	2	4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	8.0	8.0	5.0	5.0	
Minimum Split (s)	25.8	25.8	25.8	30.1	30.1	30.1	34.5	34.5	34.5	24.1	24.1	
Total Split (s)	31.6	31.6	31.6	31.6	31.6	31.6	34.5	34.5	34.5	34.4	34.4	
Total Split (%)	47.8%	47.8%	47.8%	47.8%	47.8%	47.8%	52.2%	52.2%	52.2%	52.0%	52.0%	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.3	1.3	1.3	1.6	1.6	1.6	2.0	2.0	2.0	2.6	2.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Lost Time (s)	5.8	5.8	5.8	6.1	6.1	6.1		5.5	5.5		6.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max	
Act Effct Green (s)	25.8	25.8	25.8	25.5	25.5	25.5		29.0	29.0		28.4	
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.39	0.39		0.44	0.44		0.43	
v/c Ratio	0.09	0.84	0.04	0.26	0.66	0.04		0.02	0.02		0.06	
Control Delay	14.1	31.4	1.9	20.5	22.2	2.2		10.7	0.7		8.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	14.1	31.4	1.9	20.5	22.2	2.2		10.7	0.7		8.4	
LOS	B	C	A	C	C	A		B	A		A	
Approach Delay		29.7			21.1			4.5			8.4	
Approach LOS		C			C			A			A	
Queue Length 50th (ft)	5	217	0	9	154	0		2	0		6	
Queue Length 95th (ft)	19	#394	6	32	250	8		10	3		23	
Internal Link Dist (ft)		531			453			70			1002	
Turn Bay Length (ft)	180		230	275		275						
Base Capacity (vph)	239	727	648	129	718	642		674	723		720	
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	
Reduced v/c Ratio	0.09	0.84	0.04	0.26	0.66	0.04		0.02	0.02		0.06	

Intersection Summary

Area Type: Other

Cycle Length: 66.1

Actuated Cycle Length: 66.1

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 24.7

Intersection LOS: C

Intersection Capacity Utilization 54.9%

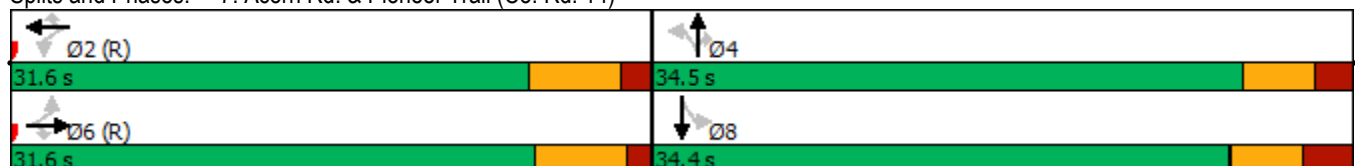
ICU Level of Service A

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 7: Acorn Rd. & Pioneer Trail (Co. Rd. 14)



Lanes, Volumes, Timings
3: Ironwood Blvd. & Butternut Dr.

06/29/2021

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	24	0	1	22	0	0
Future Volume (vph)	24	0	1	22	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	8	14	8	8	14
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.880					
Flt Protected	0.950					
Satd. Flow (prot)	1735	0	1693	0	0	2027
Flt Permitted	0.950					
Satd. Flow (perm)	1735	0	1693	0	0	2027
Link Speed (mph)	25	25		25		
Link Distance (ft)	495	372		154		
Travel Time (s)	13.5	10.1		4.2		
Confl. Peds. (#/hr)	2	5				
Peak Hour Factor	0.75	1.00	0.25	0.69	1.00	1.00
Heavy Vehicles (%)	11%	0%	0%	6%	0%	0%
Adj. Flow (vph)	32	0	4	32	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	32	0	36	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	14	0		0		
Link Offset(ft)	0	0		0		
Crosswalk Width(ft)	16	16		16		
Two way Left Turn Lane						
Headway Factor	0.92	1.20	0.92	1.20	1.20	0.92
Turning Speed (mph)	15	9	9		15	
Sign Control	Free	Yield		Yield		
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 14.9%			ICU Level of Service A			
Analysis Period (min) 15						

Intersection

Int Delay, s/veh 0.9

Movement EBL EBR NBL NBT SBT SBRLane Configurations 

Traffic Vol, veh/h 9 4 5 479 949 10

Future Vol, veh/h 9 4 5 479 949 10

Conflicting Peds, #/hr 0 0 0 0 0 0

Sign Control Stop Stop Free Free Free Free

RT Channelized - None - None - None

Storage Length 0 - - - - 195

Veh in Median Storage, # 0 - - 0 0 -

Grade, % 0 - - 0 0 -

Peak Hour Factor 56 25 42 91 77 63

Heavy Vehicles, % 14 0 25 2 1 0

Mvmt Flow 16 16 12 526 1232 16

Major/Minor Minor2 Major1 Major2

Conflicting Flow All 1782 1232 1248 0 - 0

Stage 1 1232 - - - - -

Stage 2 550 - - - - -

Critical Hdwy 6.54 6.2 4.35 - - -

Critical Hdwy Stg 1 5.54 - - - - -

Critical Hdwy Stg 2 5.54 - - - - -

Follow-up Hdwy 3.626 3.3 2.425 - - -

Pot Cap-1 Maneuver 84 218 486 - - -

Stage 1 260 - - - - -

Stage 2 555 - - - - -

Platoon blocked, % - - -

Mov Cap-1 Maneuver 81 218 486 - - -

Mov Cap-2 Maneuver 81 - - - - -

Stage 1 251 - - - - -

Stage 2 555 - - - - -

Approach EB NB SB

HCM Control Delay, s 46.5 0.3 0

HCM LOS E

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h) 486 - 118 - -

HCM Lane V/C Ratio 0.024 - 0.272 - -

HCM Control Delay (s) 12.6 0 46.5 - -

HCM Lane LOS B A E - -

HCM 95th %tile Q(veh) 0.1 - 1 - -

Intersection

Int Delay, s/veh 2.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	3	17	20	3	23
Future Vol, veh/h	14	3	17	20	3	23
Conflicting Peds, #/hr	6	0	0	6	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	70	75	85	63	75	72
Heavy Vehicles, %	0	100	20	31	100	36
Mvmt Flow	20	4	20	32	4	32

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	88	42	0
Stage 1	42	-	-
Stage 2	46	-	-
Critical Hdwy	6.4	7.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	4.2	-
Pot Cap-1 Maneuver	918	808	-
Stage 1	986	-	-
Stage 2	982	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	901	803	-
Mov Cap-2 Maneuver	901	-	-
Stage 1	979	-	-
Stage 2	971	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.2	0	0.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	883	1090
HCM Lane V/C Ratio	-	-	0.027	0.004
HCM Control Delay (s)	-	-	9.2	8.3
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

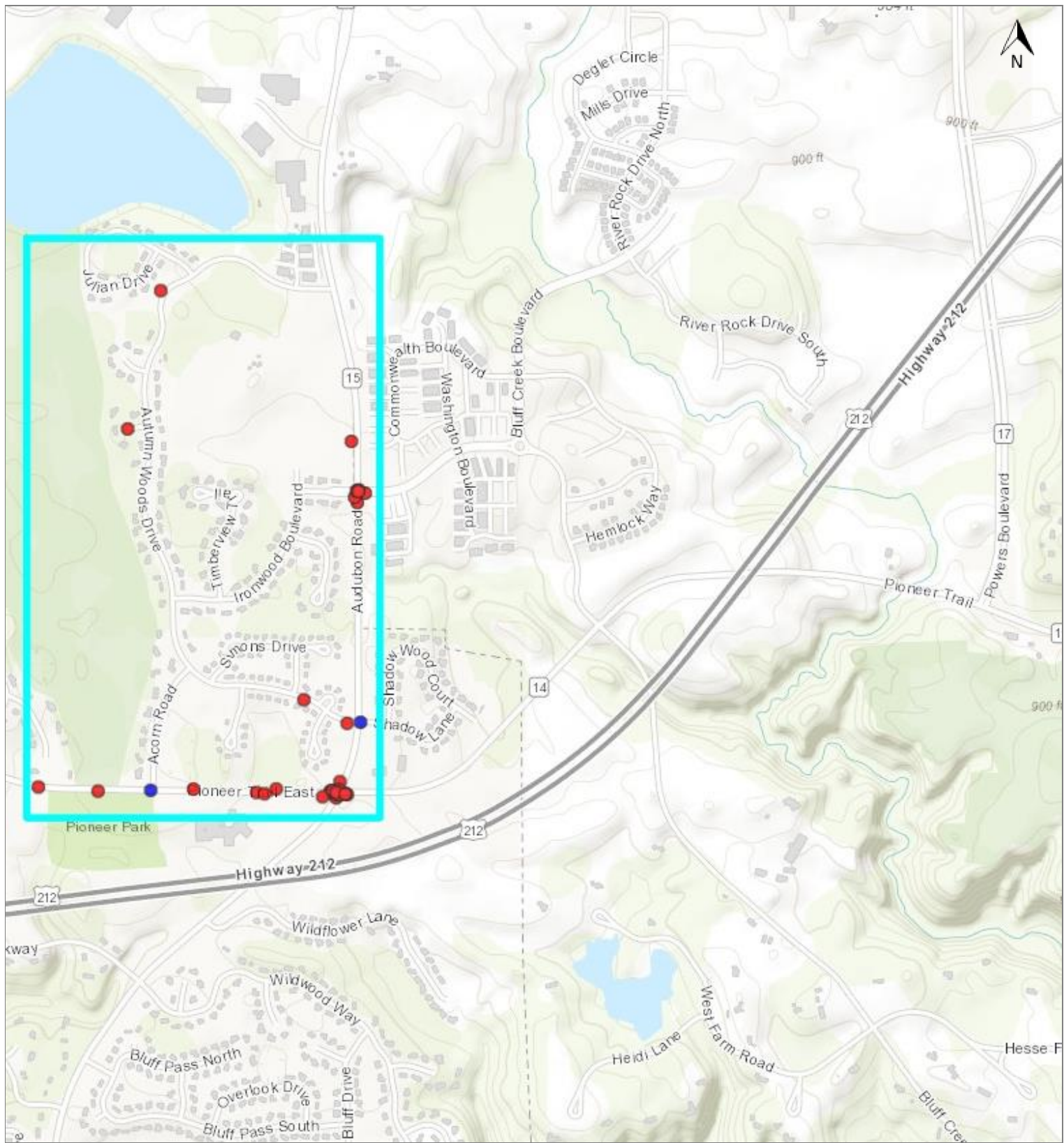
Intersection	
Intersection Delay, s/veh	7
Intersection LOS	A

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	5	35	8	6	31	22
Future Vol, veh/h	5	35	8	6	31	22
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	0	0	0	0	4	6
Mvmt Flow	5	35	8	6	31	22
Number of Lanes	1	0	0	1	1	0

Approach	SE	NW	NE
Opposing Approach	NW	SE	
Opposing Lanes	1	1	0
Conflicting Approach Left		NE	SE
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NE		NW
Conflicting Lanes Right	1	0	1
HCM Control Delay	6.6	7.2	7.2
HCM LOS	A	A	A

Lane	NELn1	NWLn1	SELn1
Vol Left, %	58%	57%	0%
Vol Thru, %	0%	43%	12%
Vol Right, %	42%	0%	88%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	53	14	40
LT Vol	31	8	0
Through Vol	0	6	5
RT Vol	22	0	35
Lane Flow Rate	53	14	40
Geometry Grp	1	1	1
Degree of Util (X)	0.058	0.016	0.039
Departure Headway (Hd)	3.929	4.138	3.477
Convergence, Y/N	Yes	Yes	Yes
Cap	914	865	1028
Service Time	1.943	2.162	1.502
HCM Lane V/C Ratio	0.058	0.016	0.039
HCM Control Delay	7.2	7.2	6.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.2	0	0.1

Appendix T: Crash Map



LENNAR

DISCOVERY SERIES
EK04 A2 - ALEXANDER

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L1	LOWER LEVEL FINISH OPTIONS
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S1	STRUCTURAL DETAILS
S2	STRUCTURAL DETAILS
S3	BRACED WALL DETAILS
S4	BRACED WALL DETAILS

SQUARE FOOTAGES

STOOP:	99 SQ. FT.
GARAGE:	524 SQ. FT.
BASEMENT UNFINISHED:	1040 SQ. FT.
MAIN FLOOR FINISHED:	1040 SQ. FT.
UPPER FLOOR FINISHED:	1402 SQ. FT.
TOTAL FINISHED:	2442 SQ. FT.
BASEMENT FINISH OPTION (SEE SHEET L1):	836 SQ. FT.
OTHER:	N/A

EXTERIOR NOTES

SIDING MATERIALS PER COMMUNITY SPECIFICATIONS.
STYLE PER PLAN.

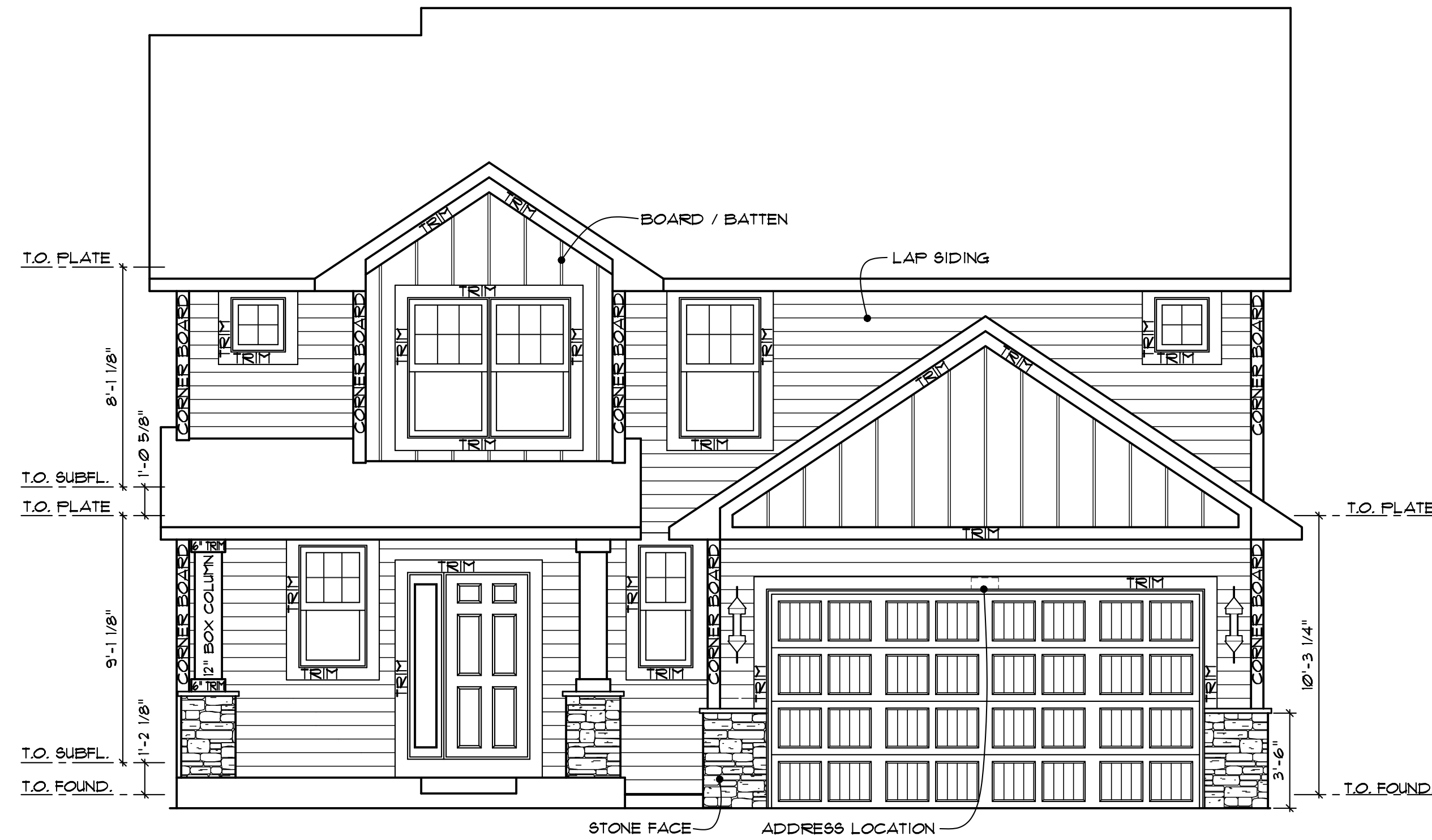
REPLACE 1/2" BUILT-RITE SHEATHING WITH 1/2" O.S.B.
SHEATHING BEHIND ALL VINYL AND LP BOARD & BATTEN
AND / OR SHAKE SIDING.

ALUMINUM FASCIA & SOFFIT ON ALL SIDES OF HOME,
INCLUDES PORCH CEILING

ALL TRIM MATERIALS SHOWN TO BE PER COMMUNITY
SPECIFICATIONS. TRIM SIZED PER PLAN.

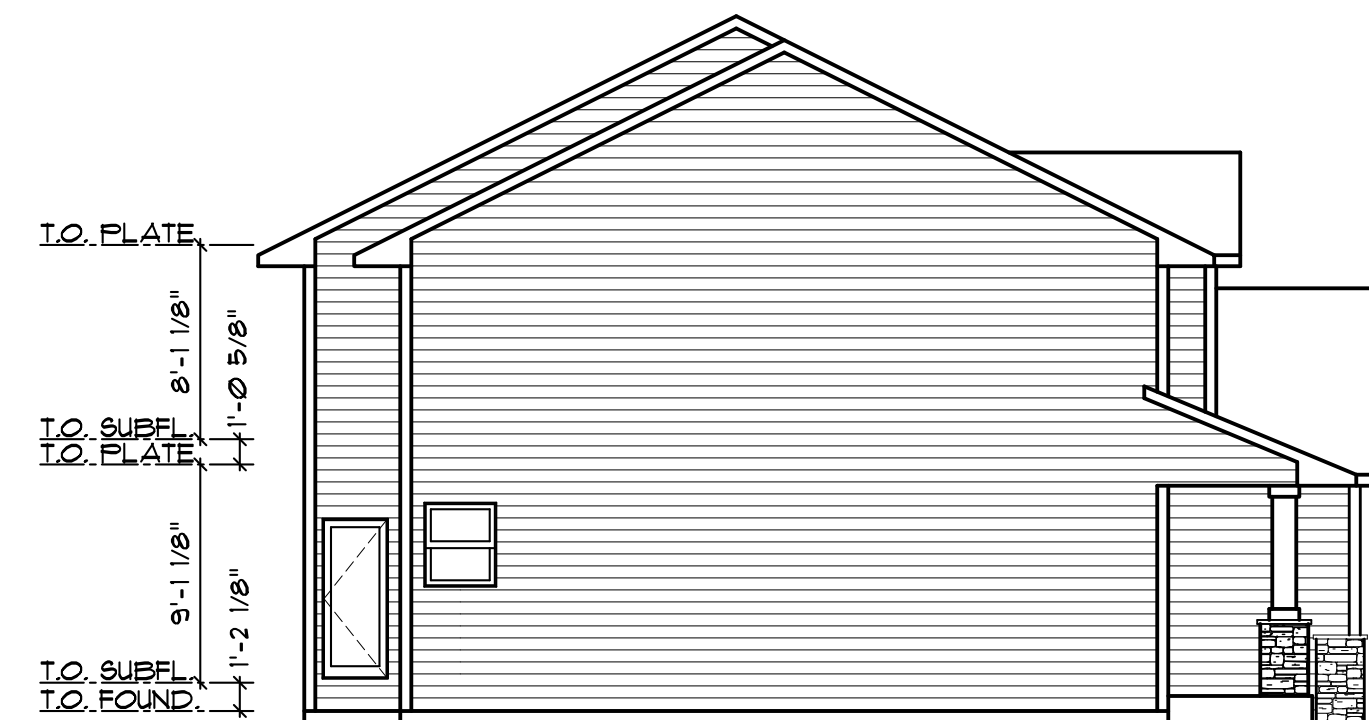
PER PLAN AND COMMUNITY SPECIFICATIONS ONLY:
WRAP ALL WINDOWS AT SIDES & REAR OF HOME W/ TRIM

INSTALL HOUSE WRAP AROUND ENTIRE HOME, SEE DETAIL
ON A4 FOR INSTRUCTIONS ON WRAPPING THE WINDOWS

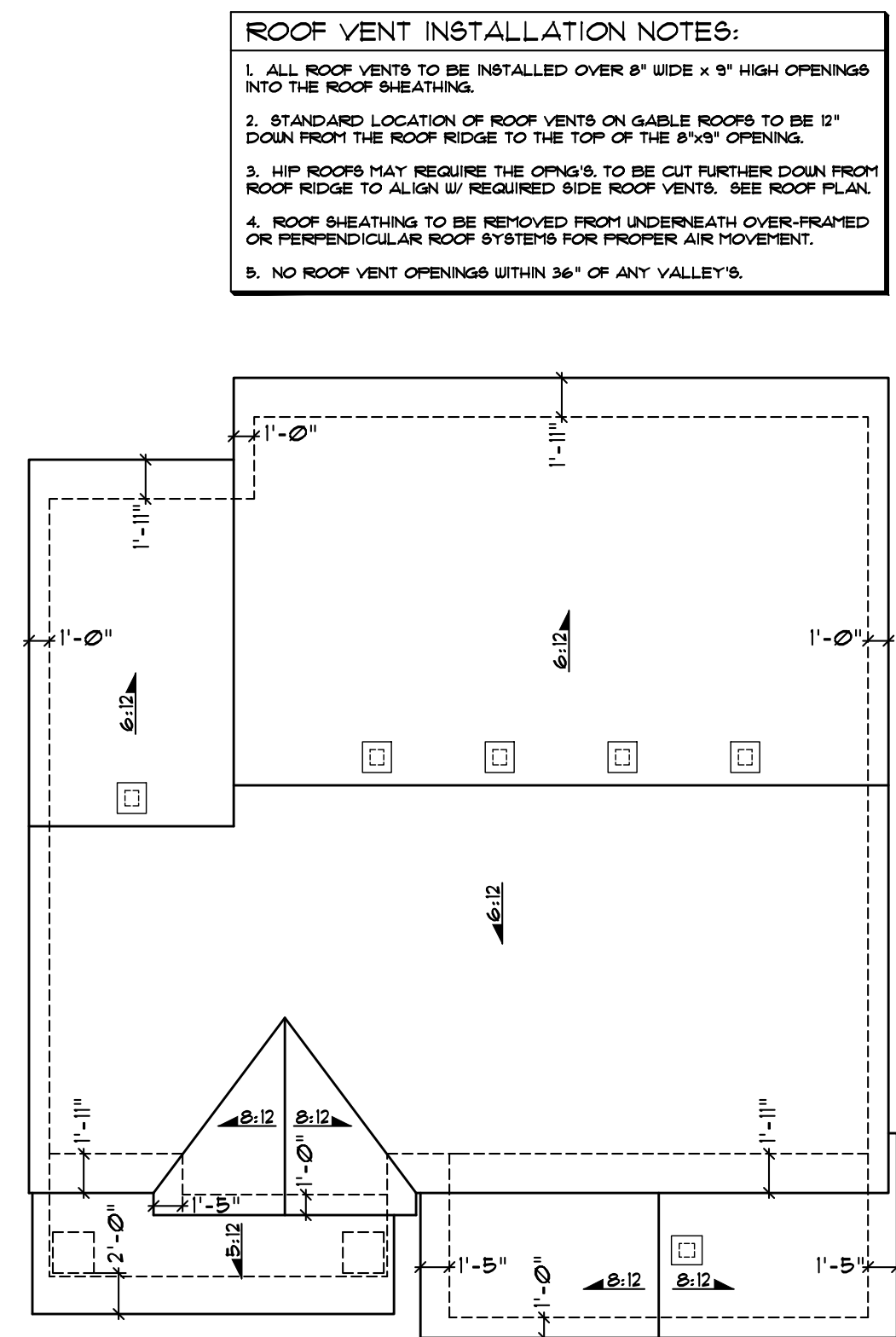


FRONT ELEVATION

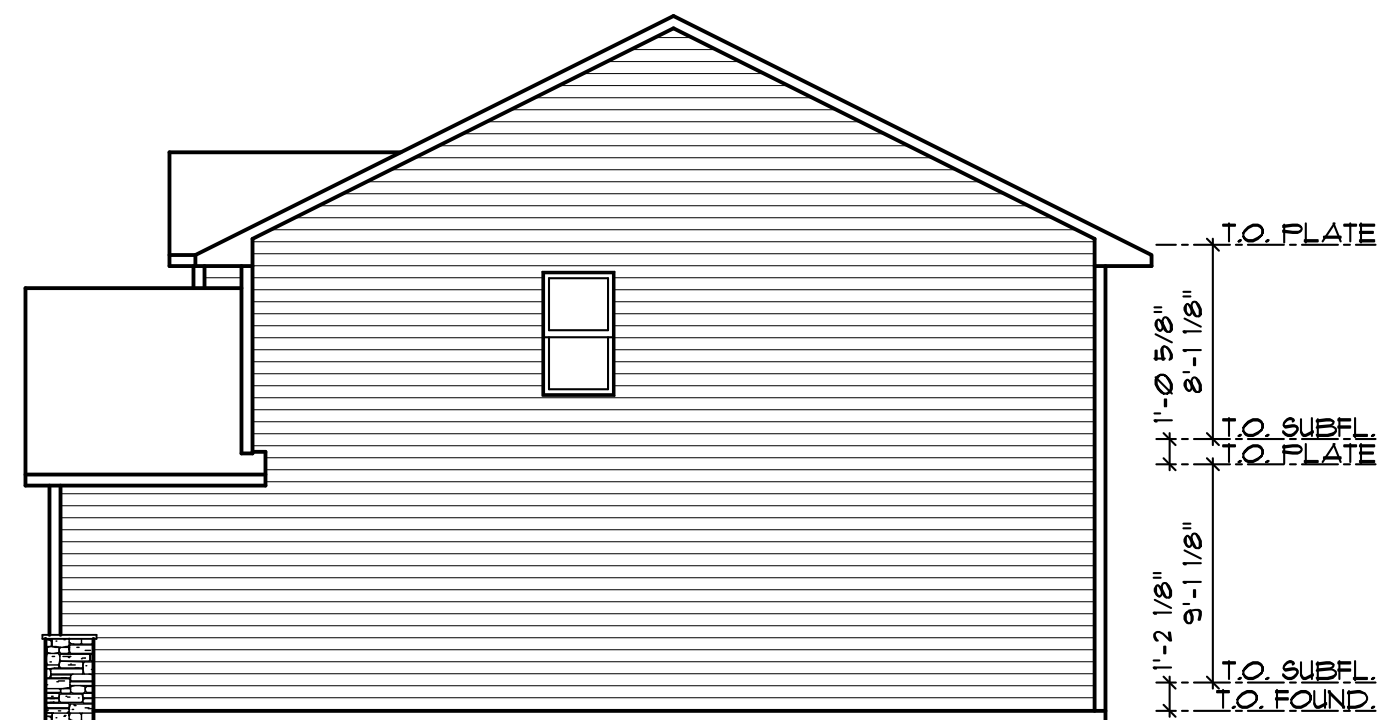
SCALE: 1/4" = 1' - 0"



3 SIDE ELEVATION
A1 SCALE: 1/8" = 1' - 0"



2 ROOF PLAN
A1 SCALE: 1/8" = 1' - 0"



4 SIDE ELEVATION
A1 SCALE: 1/8" = 1' - 0"



5 REAR ELEVATION
AI SCALE: 1/8" = 1' - 0"



5A LOOKOUT ELEVATION
A1 SCALE: 1/8" = 1'-0"



5B WALKOUT ELEVATION
AI SCALE: 1/8" = 1'-0"

ROOF VENT INSTALLATION NOTES:

1. ALL ROOF VENTS TO BE INSTALLED OVER 8" WIDE X 9" HIGH OPENINGS INTO THE ROOF SHEATHING.
2. STANDARD LOCATION OF ROOF VENTS ON GABLE ROOFS TO BE 12" DOWN FROM THE ROOF RIDGE TO THE TOP OF THE 8"x9" OPENING.
3. HIP ROOFS MAY REQUIRE THE OPENING'S TO BE CUT FURTHER DOWN FROM ROOF RIDGE TO ALIGN W/ REQUIRED SIDE ROOF VENTS. SEE ROOF PLAN.
4. ROOF SHEATHING TO BE REMOVED FROM UNDERNEATH OVER-FRAMED OR PERPENDICULAR ROOF SYSTEMS FOR PROPER AIR MOVEMENT.
5. NO ROOF VENT OPENINGS WITHIN 36" OF ANY VALLEY'S.

DATE: MARCH 2019
DRAWN BY:
REVISED: 05-01-2021
REVISED:
REVISED:

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LENNAR®

GARAGE BUMP OPTION

EK04 A2 - ALEXANDER

OWNER: **EK04**

PROJECT ADDRESS:

DEVELOPMENT:

LOT NO.
BLOCK NO.
ADDITION NO.

PN:
TITLE: ELEV
SHEET: A1

LENNAR

DISCOVERY SERIES
EK05 A2 - LEWIS

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F1 FIREPLACE DETAILS
L1 LOWER LEVEL FINISH PLANS

S1 STRUCTURAL DETAILS
S2 STRUCTURAL DETAILS
S3 BRACED WALL DETAILS
S4 BRACED WALL DETAILS

SQUARE FOOTAGES

STOOP:	56 SQ. FT.
GARAGE:	526 SQ. FT.
BASEMENT UNFINISHED:	1226 SQ. FT.
MAIN FLOOR FINISHED:	1226 SQ. FT.
UPPER FLOOR FINISHED:	1,466 SQ. FT.
TOTAL FINISHED:	2,692 SQ. FT.
BASEMENT FINISH OPTION (SEE SHEET L1):	791 SQ. FT.
OTHER:	N/A

EXTERIOR NOTES

SIDING MATERIALS PER COMMUNITY SPECIFICATIONS.
STYLE PER PLAN.

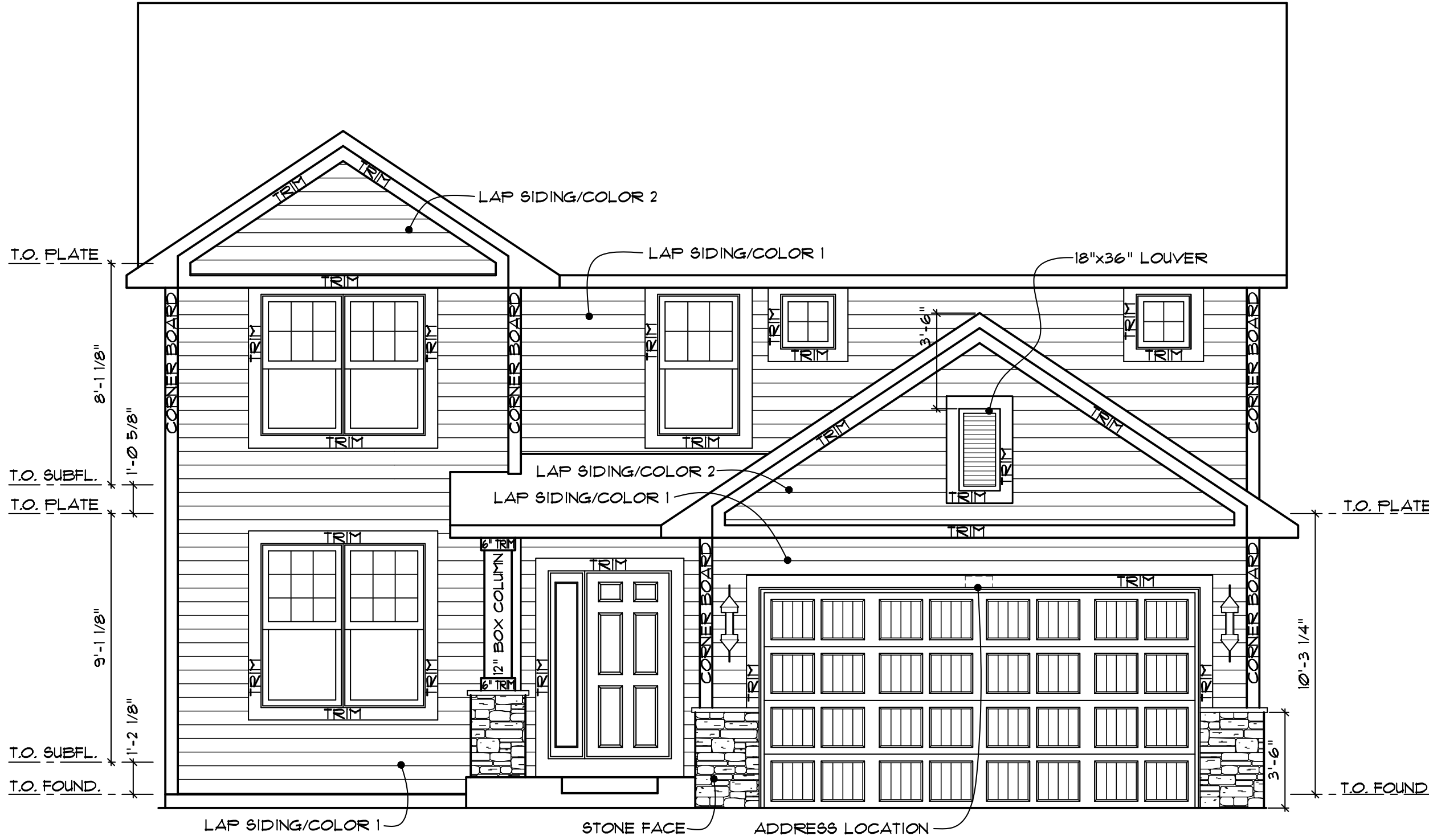
REPLACE 1/2" BUILT-RITE SHEATHING WITH 1/2" O.S.B.
SHEATHING BEHIND ALL VINYL AND LP BOARD & BATTEN
AND / OR SHAKE SIDING.

ALUMINUM FASCIA & SOFFIT ON ALL SIDES OF HOME,
INCLUDES PORCH CEILING

ALL TRIM MATERIALS SHOWN TO BE PER COMMUNITY
SPECIFICATIONS. TRIM SIZED PER PLAN.

PER PLAN AND COMMUNITY SPECIFICATIONS ONLY:
WRAP ALL WINDOWS AT SIDES & REAR OF HOME W/ TRIM

INSTALL HOUSE WRAP AROUND ENTIRE HOME, SEE DETAIL
ON A4 FOR INSTRUCTIONS ON WRAPPING THE WINDOWS



1 FRONT ELEVATION
SCALE: 1/4" = 1'-0"



3 SIDE ELEVATION
SCALE: 1/8" = 1'-0"



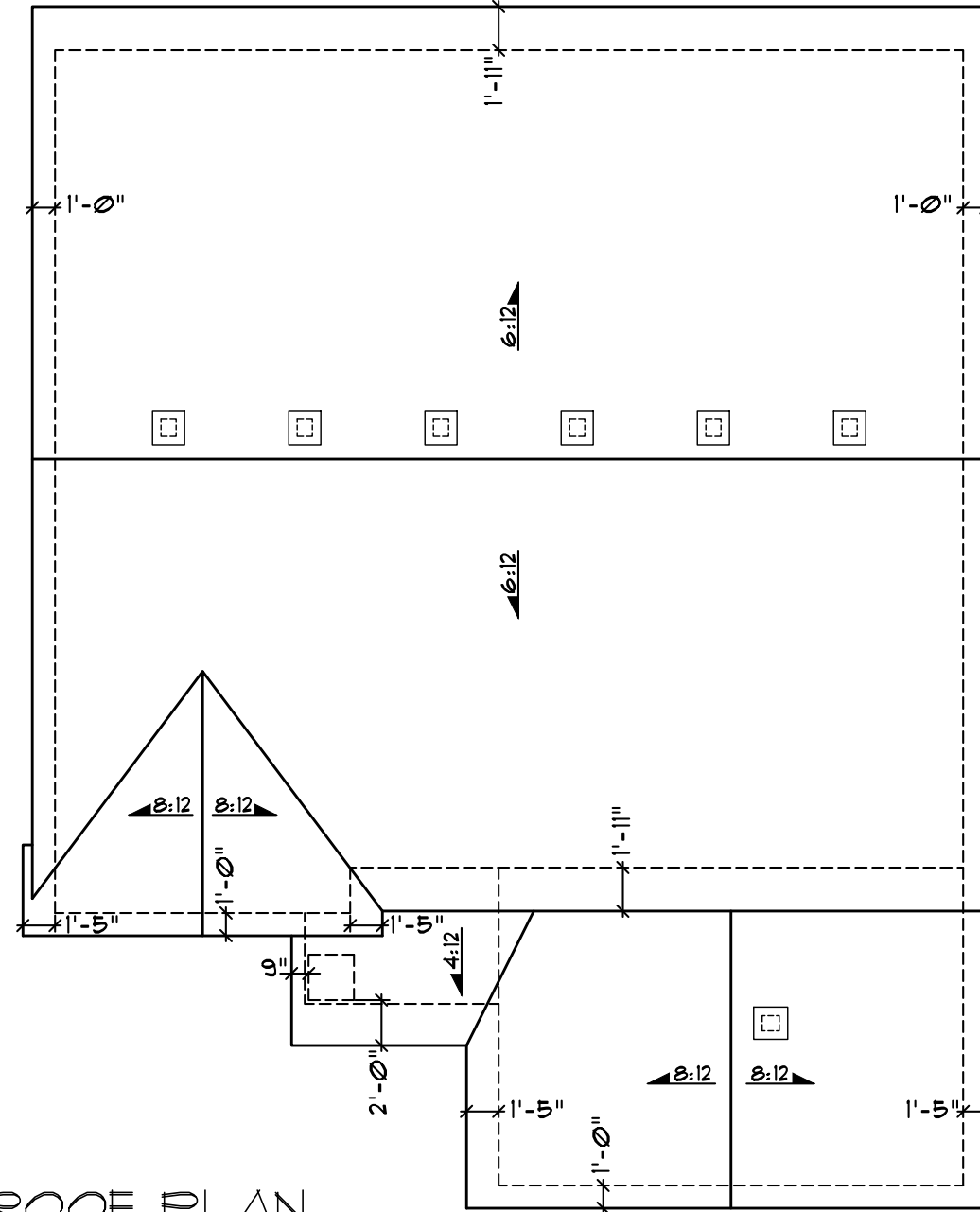
5 REAR ELEVATION
SCALE: 1/8" = 1'-0"



5A LOOKOUT ELEVATION
SCALE: 1/8" = 1'-0"

ROOF VENT INSTALLATION NOTES:

1. ALL ROOF VENTS TO BE INSTALLED OVER 8" WIDE x 9" HIGH OPENINGS INTO THE ROOF SHEATHING.
2. STANDARD LOCATION OF ROOF VENTS ON GABLE ROOFS TO BE 12" DOWN FROM THE ROOF RIDGE TO THE TOP OF THE 8"x8" OPENING.
3. HIP ROOFS MAY REQUIRE THE OPENINGS TO BE CUT FURTHER DOWN FROM ROOF RIDGE TO ALIGN W/ REQUIRED SIDE ROOF VENTS. SEE ROOF PLAN.
4. ROOF SHEATHING TO BE REMOVED FROM UNDERNEATH OVER-FRAMED OR PERPENDICULAR ROOF SYSTEMS FOR PROPER AIR MOVEMENT.
5. NO ROOF VENT OPENINGS WITHIN 36" OF ANY VALLEYS.



2 ROOF PLAN
SCALE: 1/8" = 1'-0"



4 SIDE ELEVATION
SCALE: 1/8" = 1'-0"



5B WALKOUT ELEVATION
SCALE: 1/8" = 1'-0"

DATE: JANUARY 2019

DRAWN BY:

REVISD: 05-01-2021

REVISED:

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LENNAR

GARAGE BUMP OPTION

OWNER: EK05 A2 - LEWIS

PROJECT ADDRESS:

DEVELOPMENT:

LOT NO.
BLOCK NO.

ADDITION NO.

PN:
TITLE: ELEV
SHEET: A1

DISCOVERY SERIES
EK02 B2W-VANDERBILT-2 CAR GARAGE

A1	ELEVATIONS, ROOF PLAN, NOTES
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FI	FIREPLACE DETAILS
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TW1	TALL WALL DETAILS
S1	STRUCTURAL DETAILS
S2	STRUCTURAL DETAILS
S3	BRACED WALL DETAILS
S4	BRACED WALL DETAILS

STOOP:	144 SQ. FT.
GARAGE:	473 SQ. FT.
BASEMENT UNFINISHED:	1,108 SQ. FT.
MAIN FLOOR FINISHED:	1,115 SQ. FT.
UPPER FLOOR FINISHED:	1,156 SQ. FT.
TOTAL FINISHED:	2,271 SQ. FT.
BASEMENT FINISH OPTION (SEE SHEET L1):	855 SQ. FT.
OTHER:	N/A

SIDING MATERIALS PER COMMUNITY SPECIFICATIONS.
STYLE PER PLAN.

REPLACE 1/2" BUILT-RITE SHEATHING WITH 1/2" O.S.B.
SHEATHING BEHIND ALL VINYL AND LP BOARD & BATTEN
AND / OR SHAKE SIDING.

ALUMINUM FASCIA & SOFFIT ON ALL SIDES OF HOME,
INCLUDES PORCH CEILING

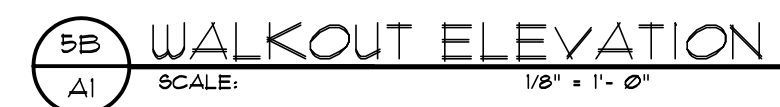
ALL TRIM MATERIALS SHOWN TO BE PER COMMUNITY SPECIFICATIONS. TRIM SIZED PER PLAN.

PER PLAN AND COMMUNITY SPECIFICATIONS ONLY:
WRAP ALL WINDOWS AT SIDES & REAR OF HOME W/ TRIM

INSTALL HOUSE WRAP AROUND ENTIRE HOME, SEE DETAIL
ON A4 FOR INSTRUCTIONS ON WRAPPING THE WINDOWS



1. ALL ROOF VENTS TO BE INSTALLED OVER 8" WIDE X 9" HIGH OPENINGS INTO THE ROOF SHEATHING.
2. STANDARD LOCATION OF ROOF VENTS ON GABLE ROOFS TO BE 12" DOWN FROM THE ROOF RIDGE TO THE TOP OF THE 8"x9" OPENING.
3. HIP ROOFS MAY REQUIRE THE OPENINGS TO BE CUT FURTHER DOWN FROM ROOF RIDGE TO ALIGN W/ REQUIRED SIDE ROOF VENTS. SEE ROOF PLAN.
4. ROOF SHEATHING TO BE REMOVED FROM UNDERNEATH OVER-FRAMED OR PERPENDICULAR ROOF SYSTEMS FOR PROPER AIR MOVEMENT.
5. NO ROOF VENT OPENINGS WITHIN 36" OF ANY VALLEY'S.



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LENNAR.

OWNER: **EK02 B2W - VANDERBILT**

PROJECT ADDRESS:
DEVELOPMENT:

LOT NO. _____
BLOCK NO. _____
ADDITION NO. _____

PN:
TITLE: ELEV
SHEET: A1

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9-Ø	GENERAL NOTES AND DETAILS
9-3	BASEMENT FOUNDATION PLAN
9-4	ROOF FRAMING PLAN
9D-1	BRACED WALL & MISC. DETAILS
9D-2	BRACED WALL DETAILS

SQUARE FOOTAGES

MAIN FLOOR	1,920 SF
FIN. LOWER LEVEL #1 - REC. RM.	1,068 SF
FIN. LOWER LEVEL #2 - FULL FINISH	1,344 SF
GARAGE	693 SF

EXTERIOR NOTES

SIDING MATERIALS PER COMMUNITY SPECIFICATIONS.
STYLE PER PLAN.

REPLACE 1/2" BUILT-RITE SHEATHING WITH 1/2" O.S.B.
SHEATHING BEHIND ALL VINYL AND LP BOARD & BATTEN
AND / OR SHAKE SIDING.

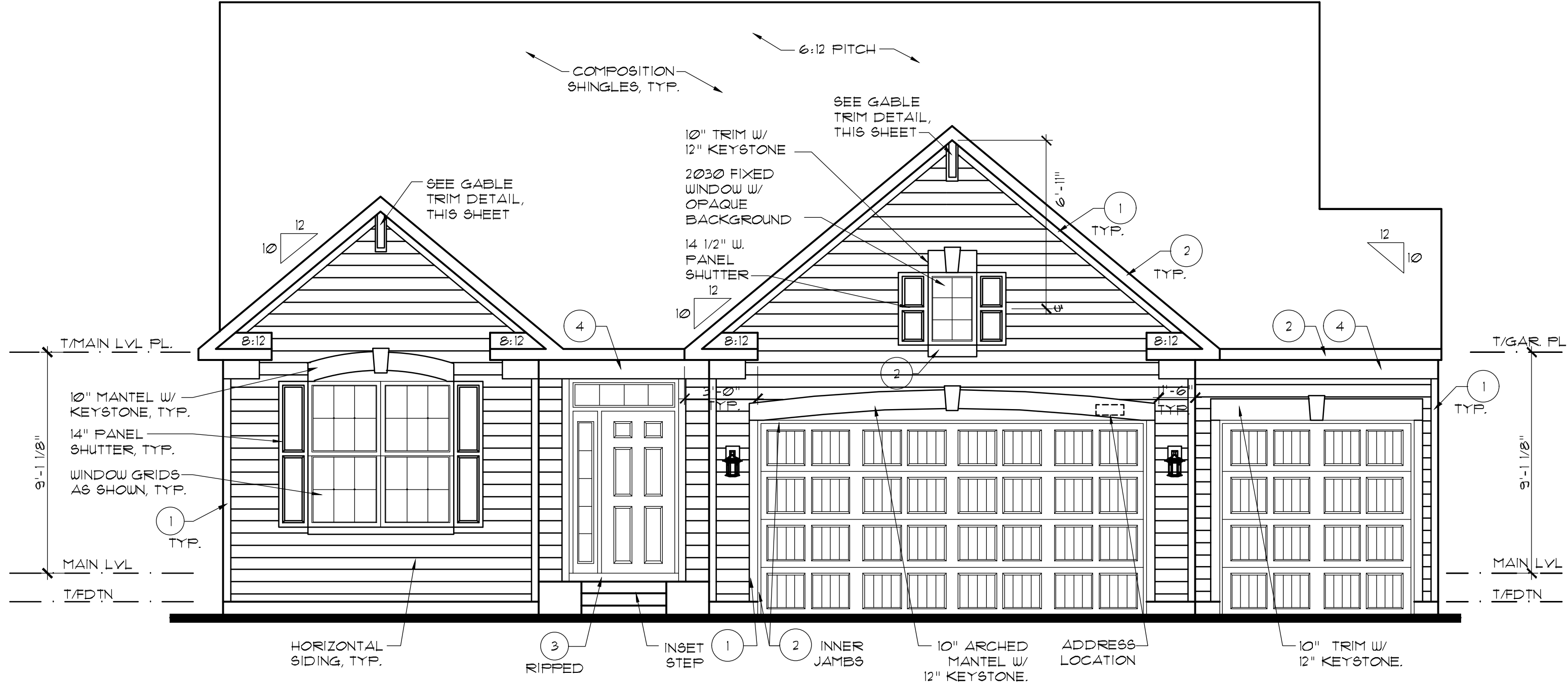
ALUMINUM FASCIA & SOFFIT ON ALL SIDES OF HOME,
INCLUDES PORCH CEILING

ALL TRIM MATERIALS SHOWN TO BE PER COMMUNITY
SPECIFICATIONS. TRIM SIZED PER PLAN.

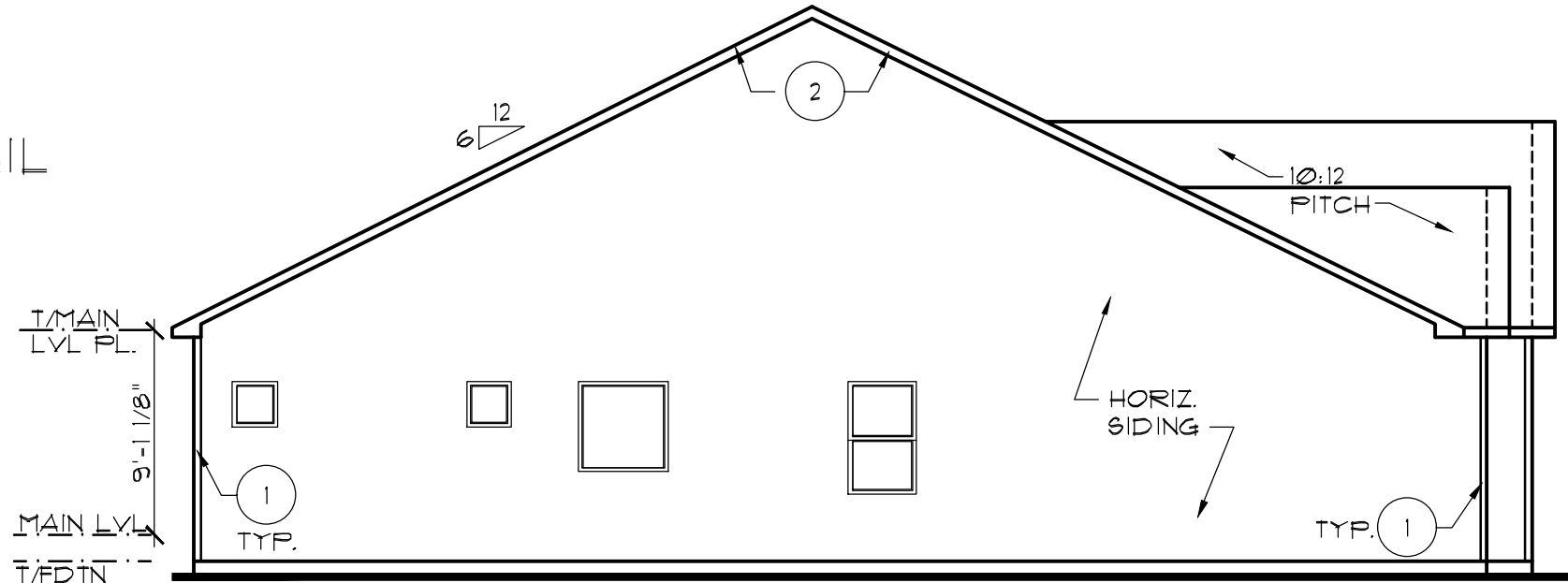
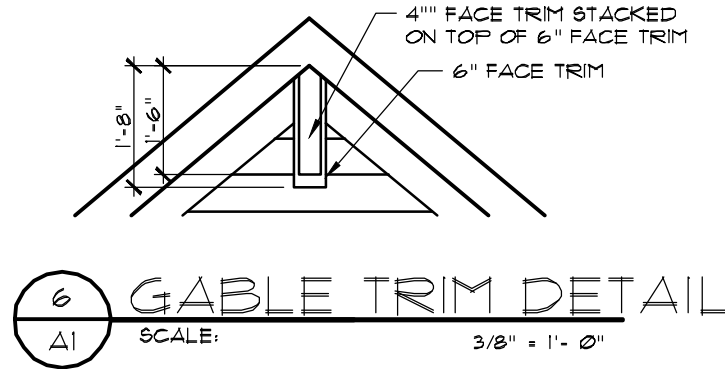
PER PLAN AND COMMUNITY SPECIFICATIONS ONLY:
WRAP ALL WINDOWS AT SIDES & REAR OF HOME W/ TRIM

INSTALL HOUSE WRAP AROUND ENTIRE HOME. SEE DETAIL
ON A4 FOR INSTRUCTIONS ON WRAPPING THE WINDOWS

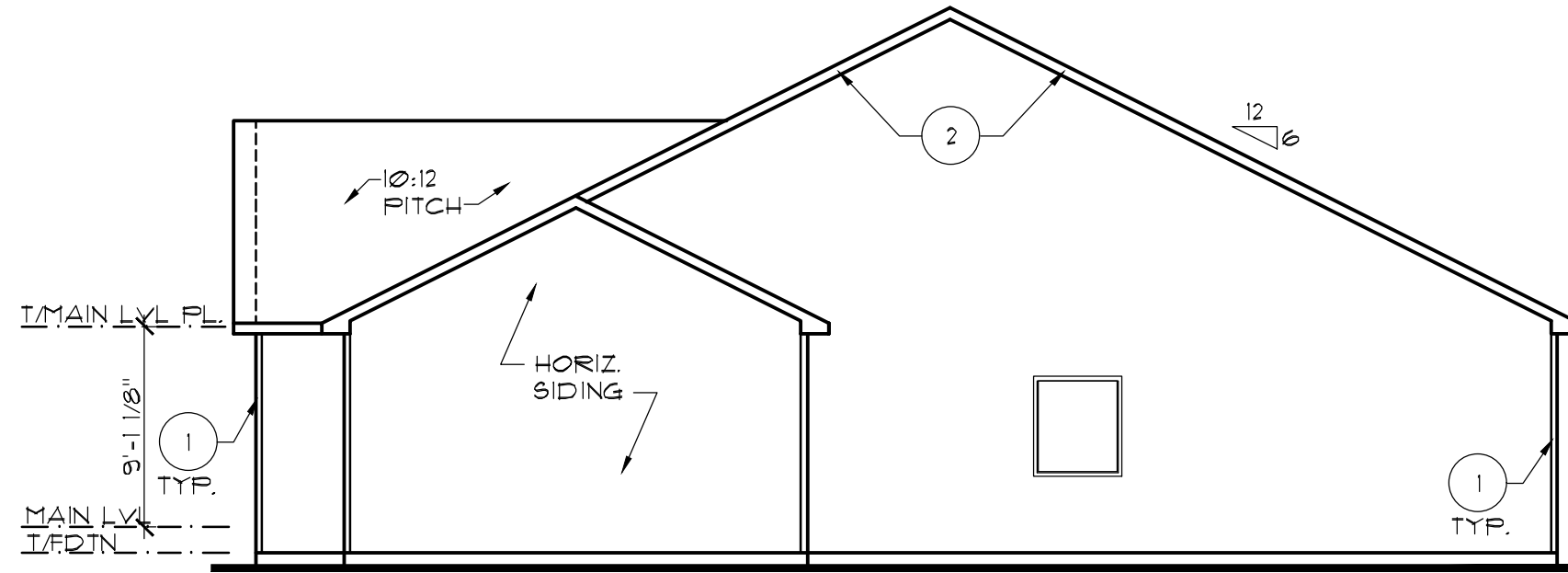
EXTERIOR TRIM KEY	
1	1 x 4 CORNERS, GABLE RAKE, WINDOW APPLICATIONS
2	1 x 6 GARAGE INNER JAMBS, WINDOW SILLS, GABLE RAKE, FASCIA
3	1 x 8 DOOR KICK PLATE
4	1 x 10 FRIEZE RETURNS
KEYNOTE SYMBOL	
MATERIAL ON TRIM KEY	
LOCATION OF MATERIAL	



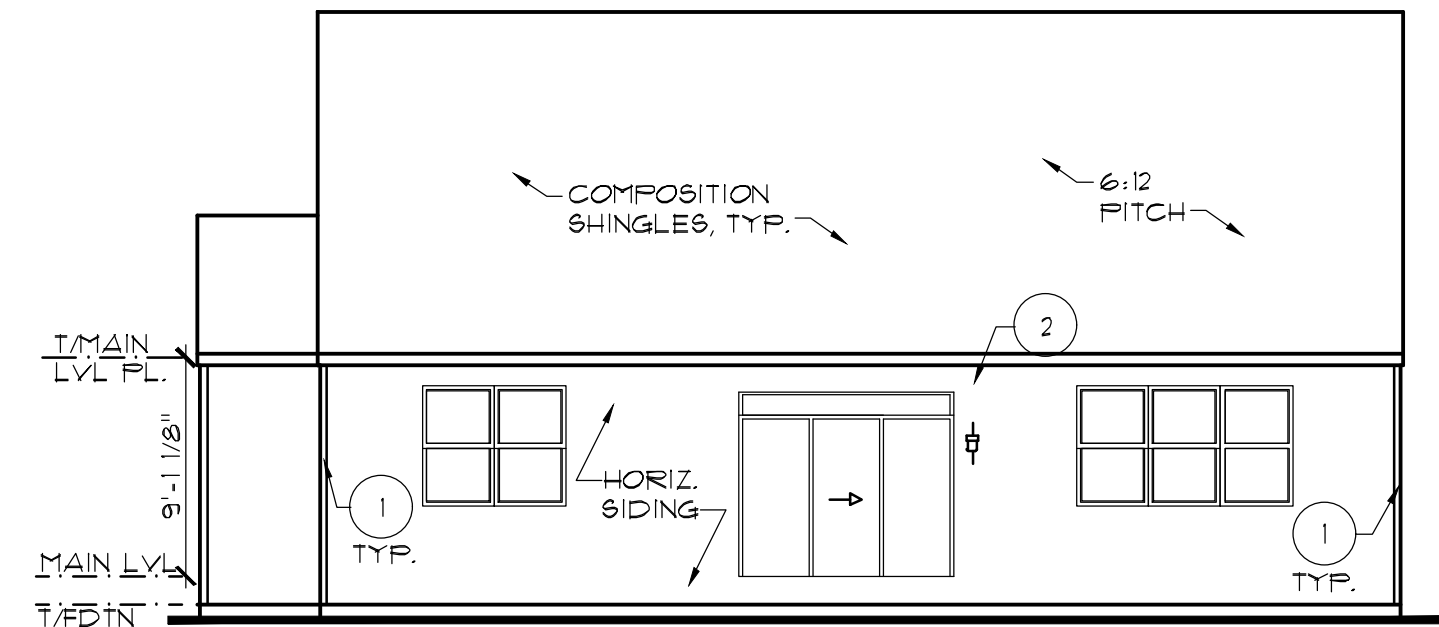
1 FRONT ELEVATION
SCALE: 1/4" = 1'-0"



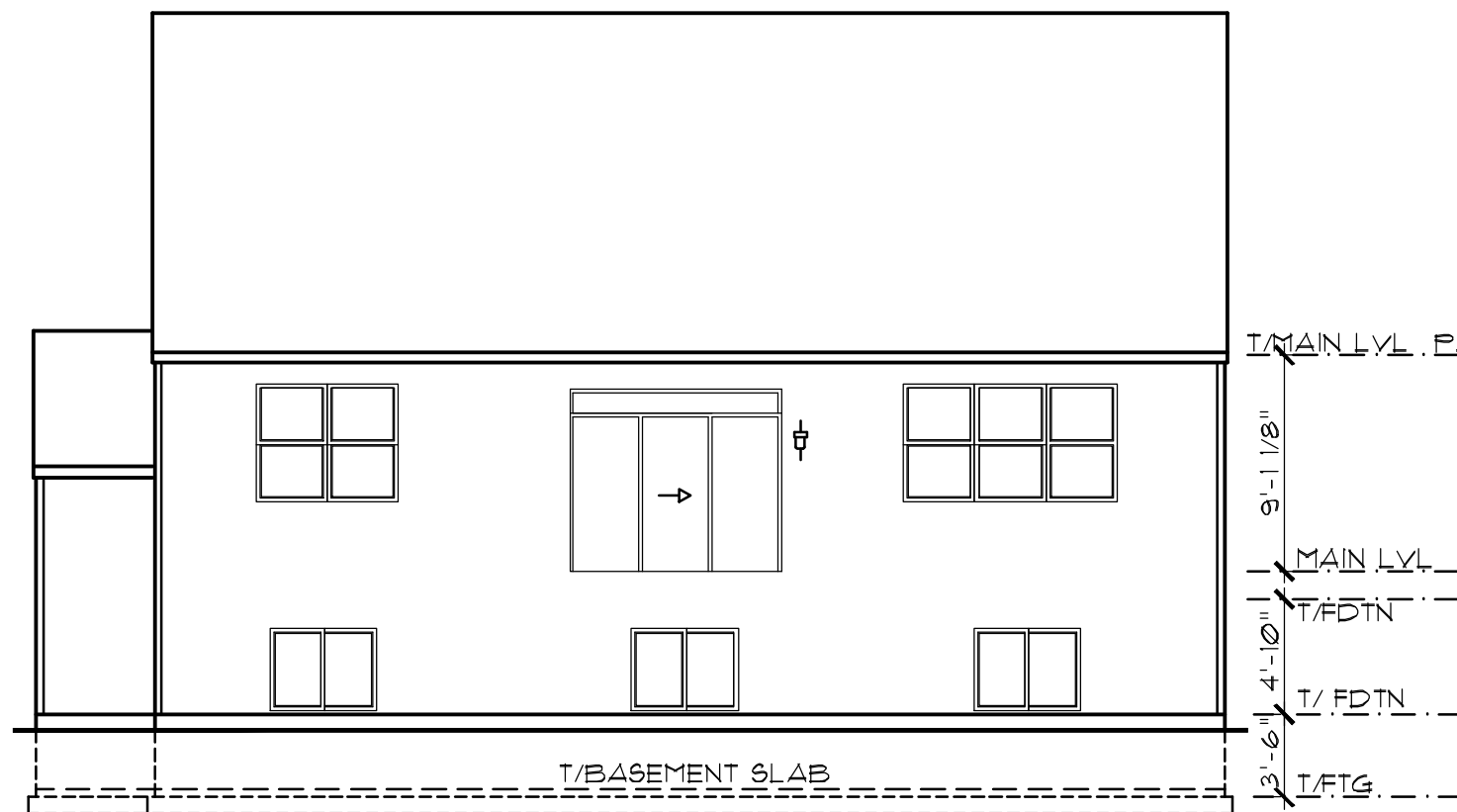
3 SIDE ELEVATION
SCALE: 1/8" = 1'-0"



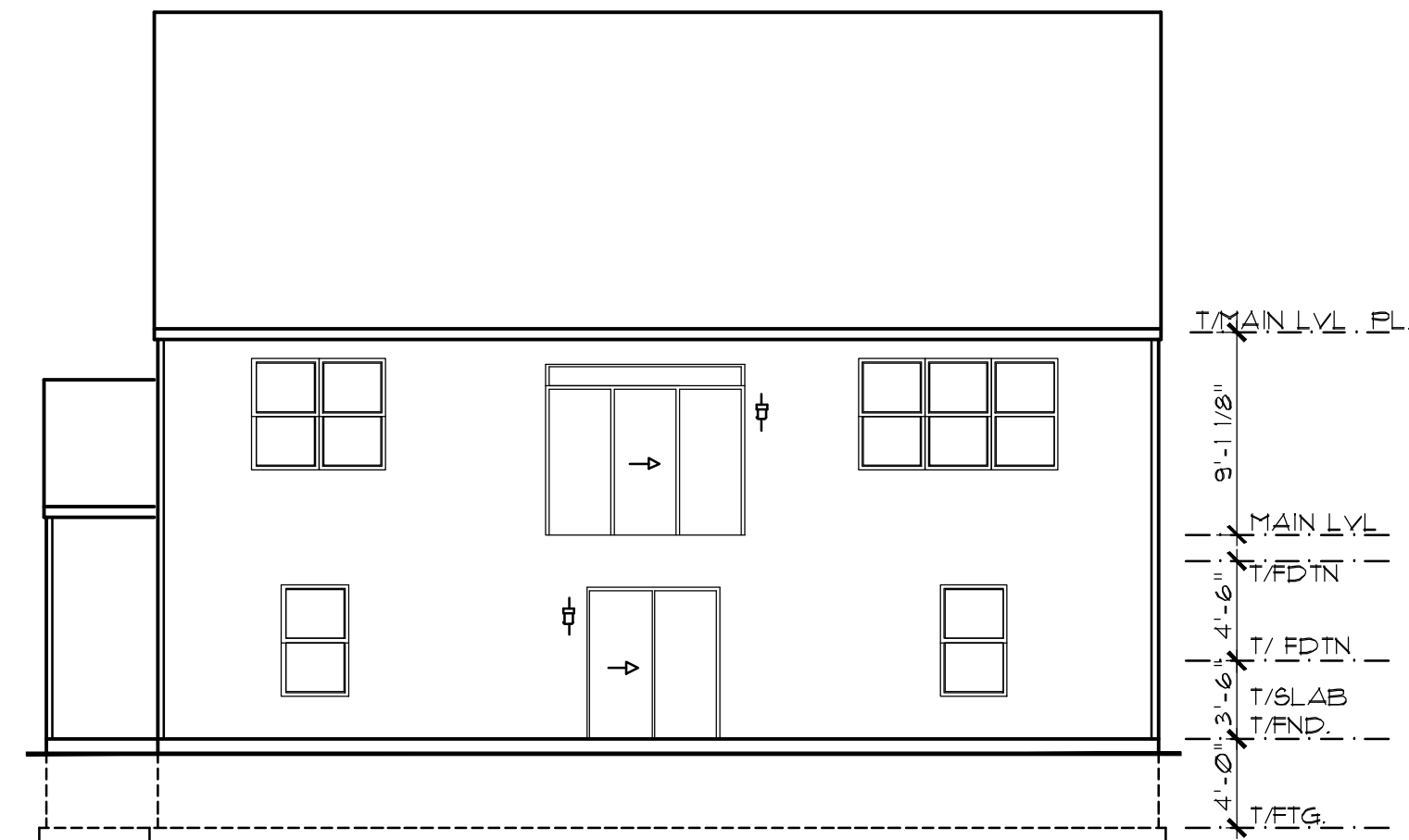
4 SIDE ELEVATION
SCALE: 1/8" = 1'-0"



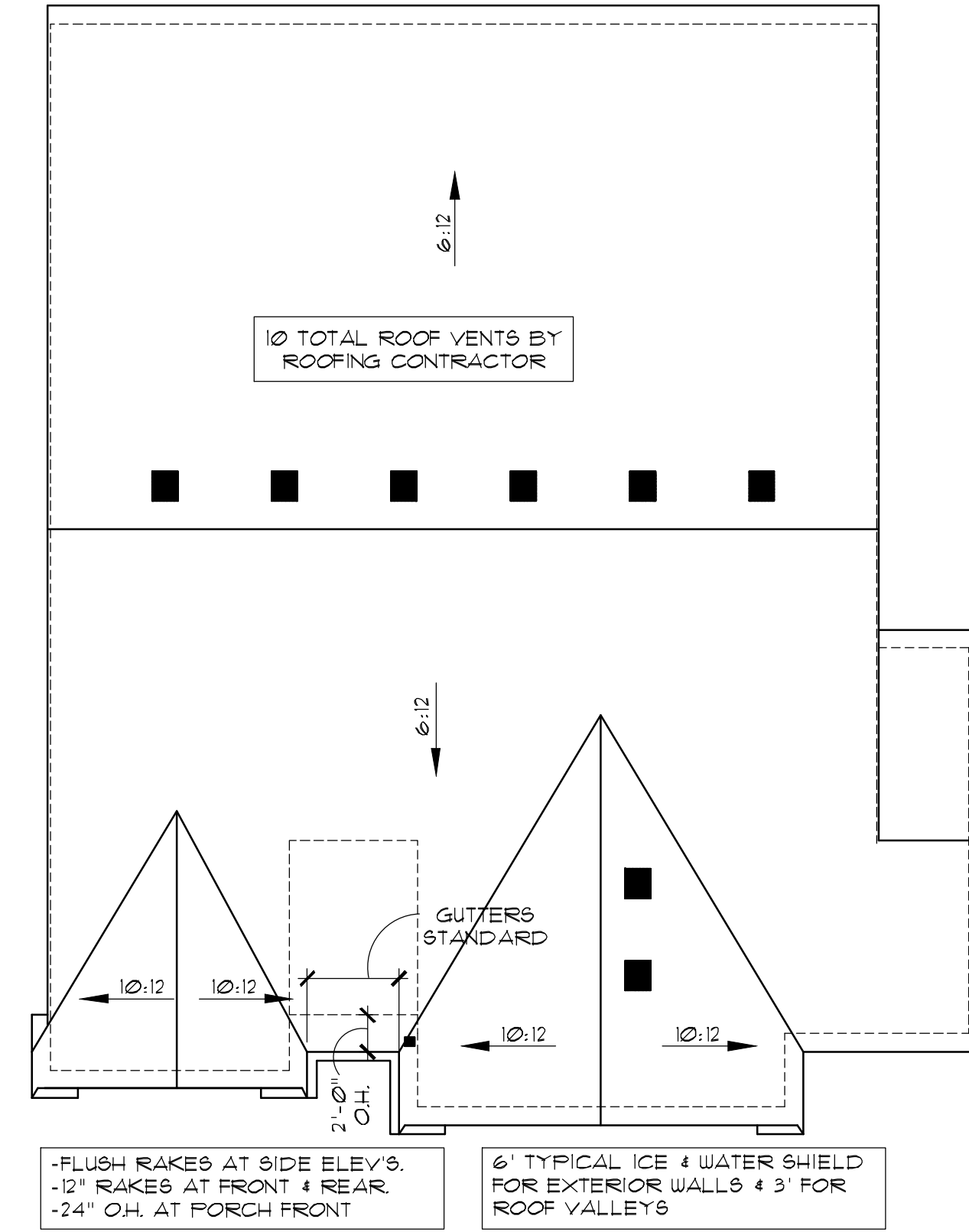
5 REAR ELEVATION
SCALE: 1/8" = 1'-0"



5A LOOKOUT ELEVATION
SCALE: 1/8" = 1'-0"



5B WALKOUT ELEVATION
SCALE: 1/8" = 1'-0"



2 ROOF PLAN
SCALE: 1/8" = 1'-0"

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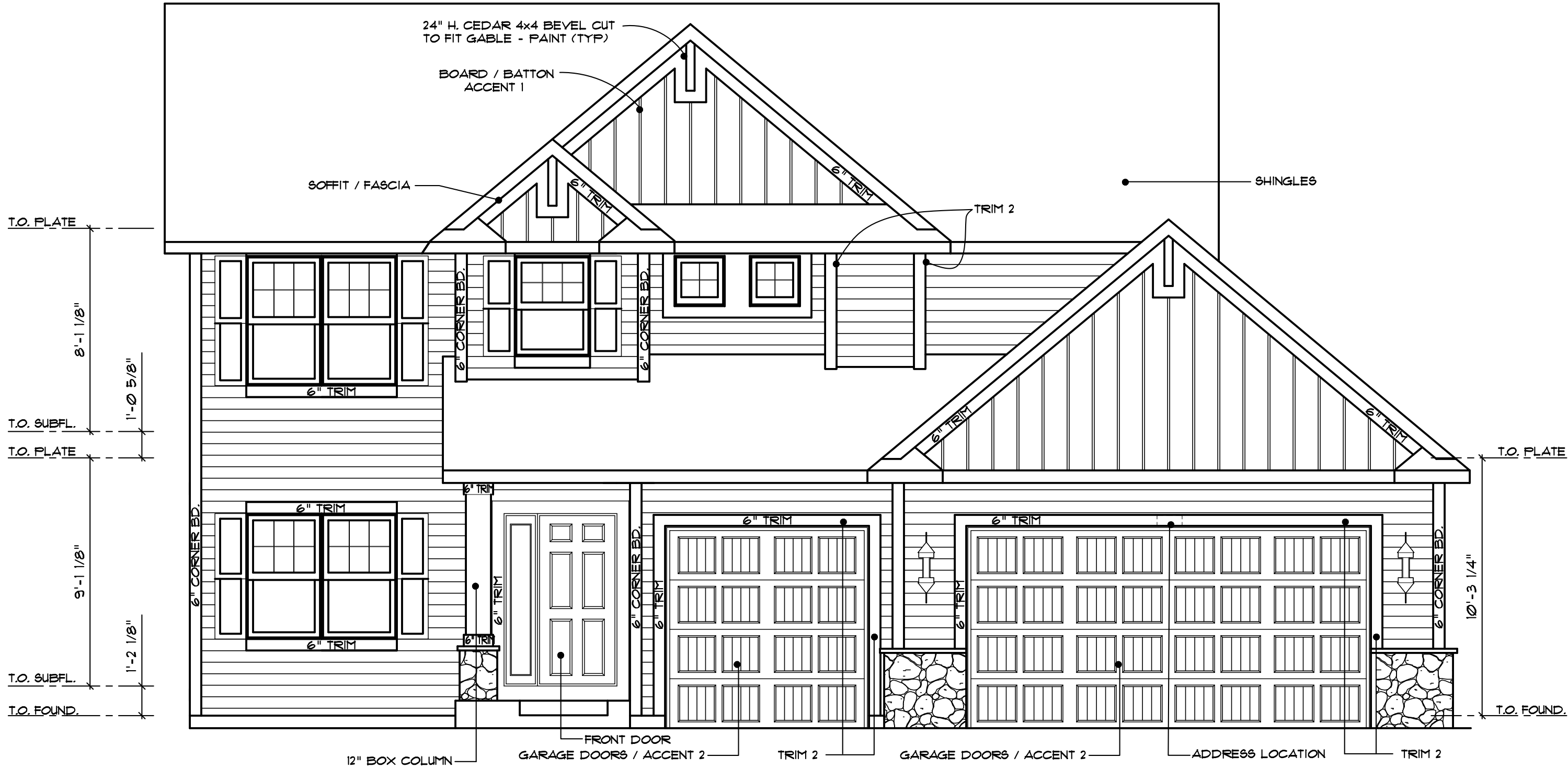
A1	ELEVATIONS, ROOF PLAN, NOTES
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TW1	TALL WALL DETAILS
S1	STRUCTURAL DETAILS
S2	STRUCTURAL DETAILS
S3	BRACED WALL DETAILS
S4	BRACED WALL DETAILS
S5	4-SEASON PORCH OPTION

SQUARE FOOTAGES

STOOP:	56 SQ. FT.
GARAGE:	180 SQ. FT.
BASEMENT UNFINISHED:	1,096 SQ. FT.
MAIN FLOOR FINISHED:	1,096 SQ. FT.
UPPER FLOOR FINISHED:	1,373 SQ. FT.
TOTAL FINISHED:	2,465 SQ. FT.
BASEMENT FINISH OPTION (SEE SHEET L1):	465 / 725 SQ. FT.
4-SEASON PORCH OPTION:	168 SQ. FT.

EXTERIOR NOTES

- SIDING MATERIALS PER COMMUNITY SPECIFICATIONS.
STYLE PER PLAN.
- REPLACE 1/2" BUILT-RITE SHEATHING WITH 1/2" O.S.B.
SHEATHING BEHIND ALL VINYL AND LP BOARD & BATTEN
AND / OR SHAKE SIDING.
- ALUMINUM FASCIA & SOFFIT ON ALL SIDES OF HOME,
INCLUDES PORCH CEILING
- ALL TRIM MATERIALS SHOWN TO BE PER COMMUNITY
SPEC'S. TRIM SIZED PER PLAN.
- PER PLAN AND COMMUNITY SPECIFICATIONS ONLY:
WRAP ALL WINDOWS AT SIDES & REAR OF HOME W/ TRIM
- INSTALL HOUSE WRAP AROUND ENTIRE HOME, SEE DETAIL
6/A5 FOR INSTRUCTIONS ON WRAPPING THE WINDOWS



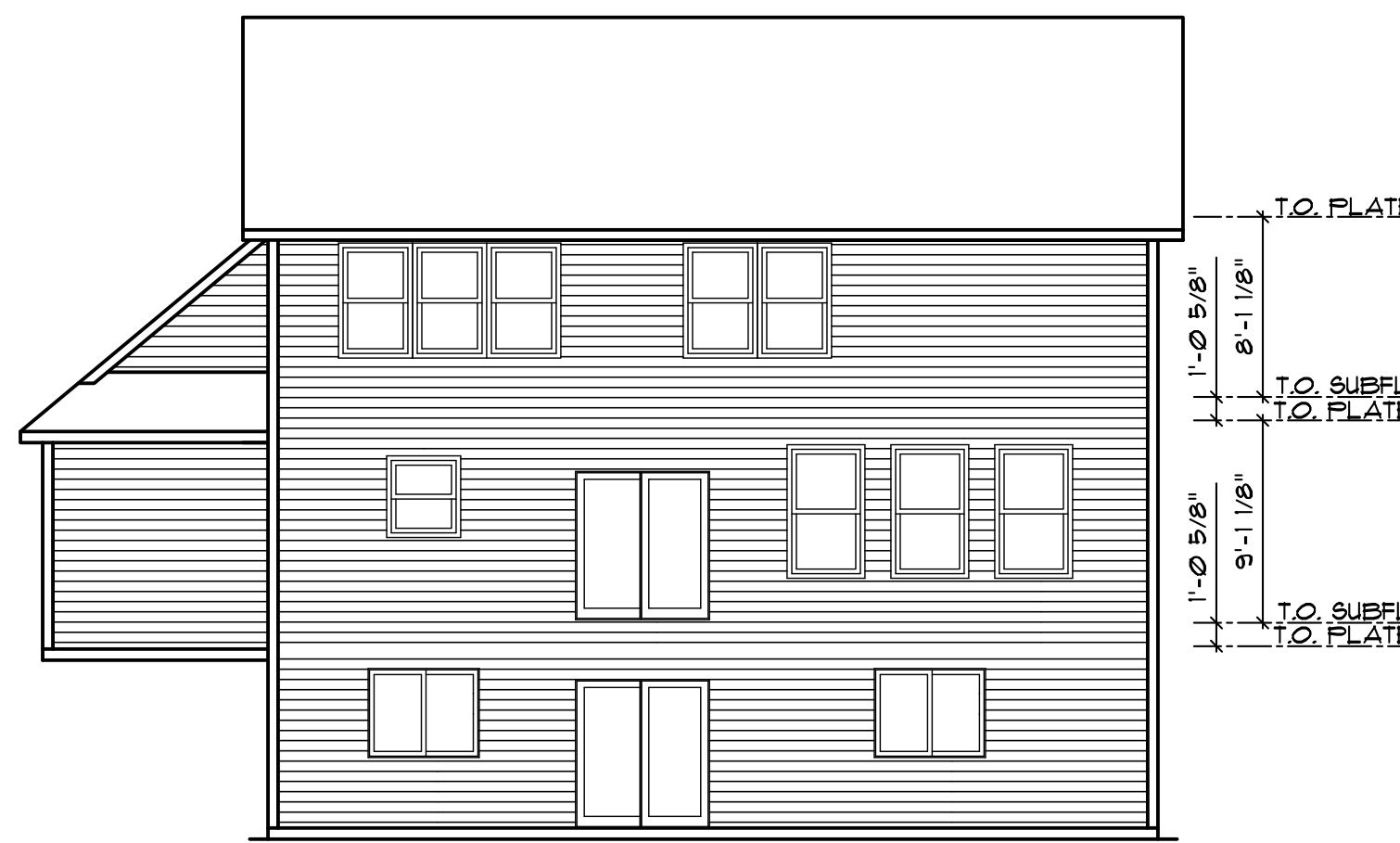
1 FRONT ELEVATION
SCALE: 1/4" = 1'-0"



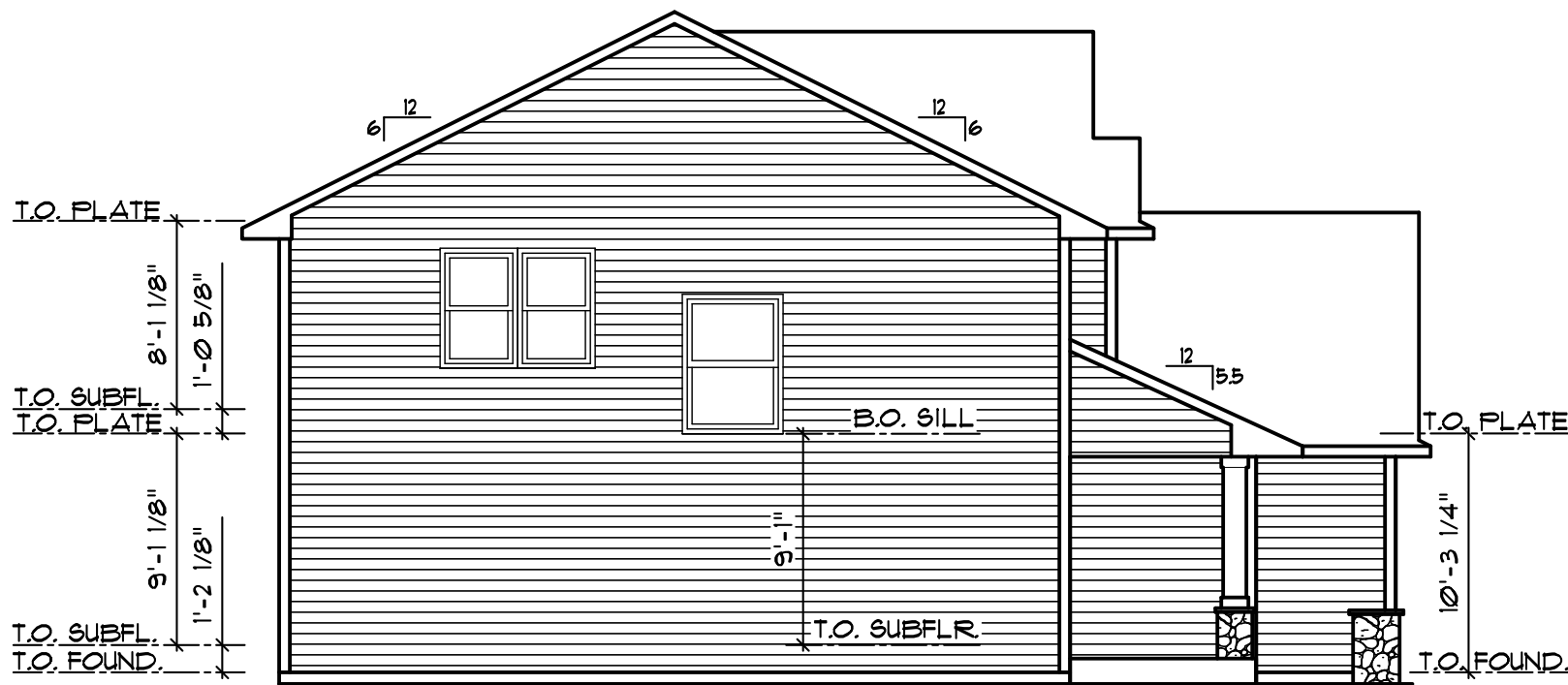
3 REAR ELEVATION
SCALE: 1/8" = 1'-0"



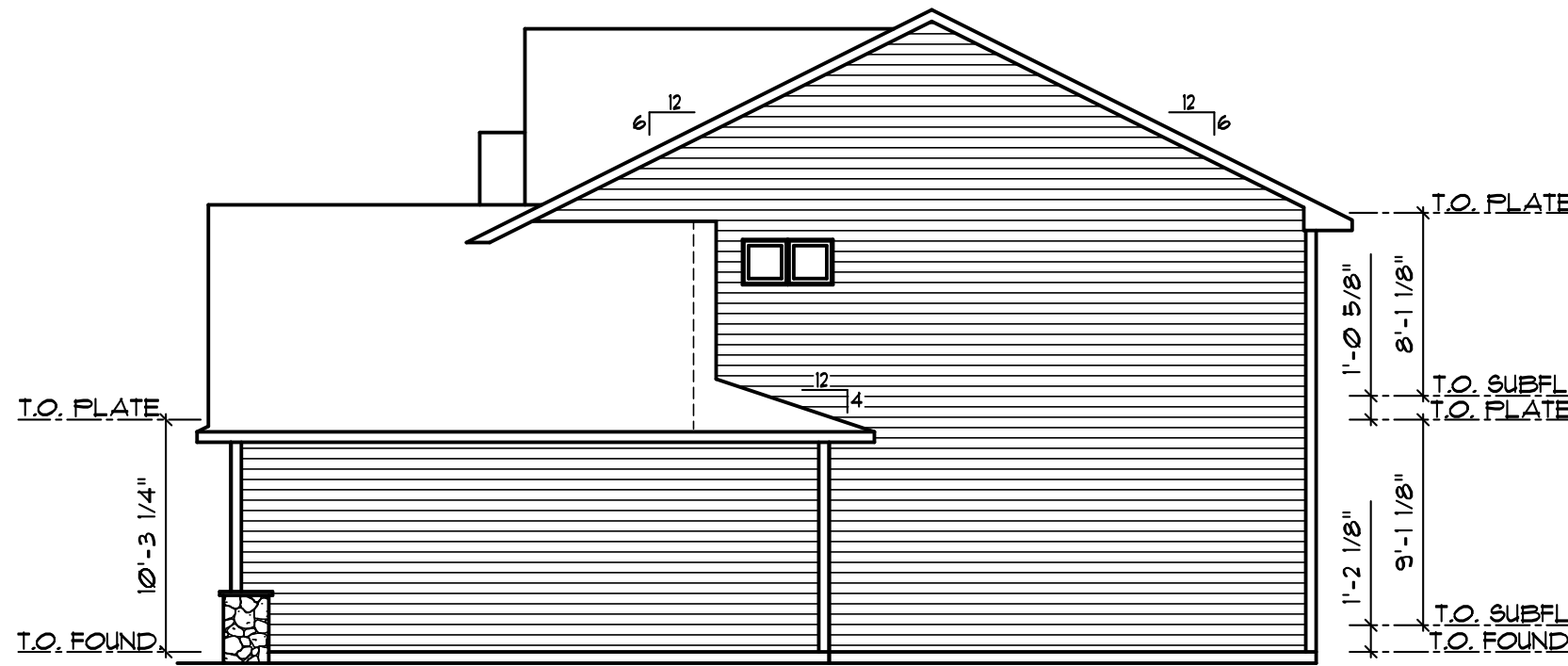
3A LOOKOUT ELEVATION
SCALE: 1/8" = 1'-0"



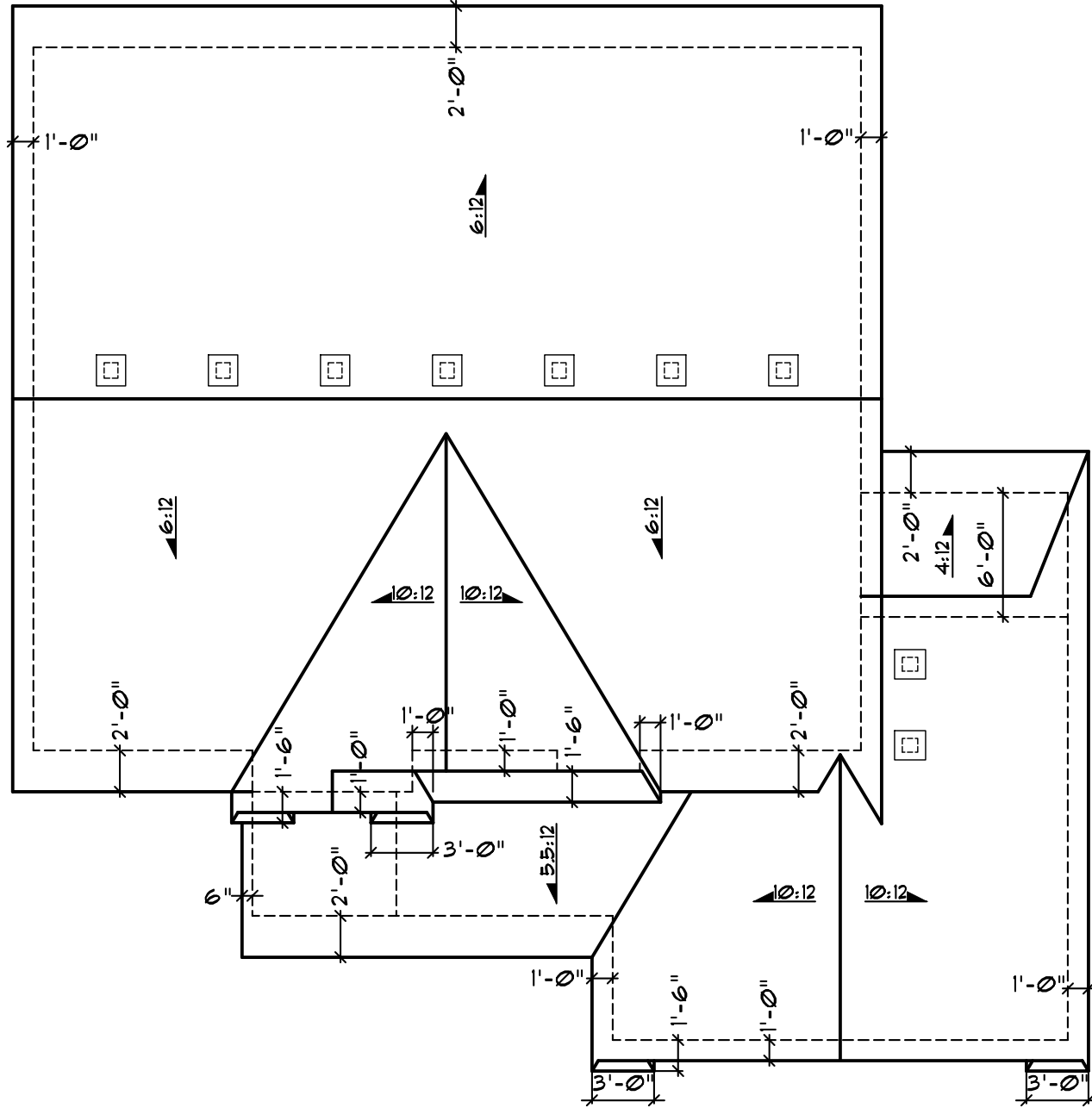
3B WALKOUT ELEVATION
SCALE: 1/8" = 1'-0"



4 SIDE ELEVATION
SCALE: 1/8" = 1'-0"



5 SIDE ELEVATION
SCALE: 1/8" = 1'-0"



2 ROOF PLAN
SCALE: 1/8" = 1'-0"

- ROOF VENT INSTALLATION NOTES:
1. ALL ROOF VENTS TO BE INSTALLED OVER 8" WIDE x 9" HIGH OPENINGS INTO THE ROOF SHEATHING.
 2. STANDARD LOCATION OF ROOF VENTS ON GABLE ROOFS TO BE 12" DOWN FROM THE ROOF RIDGE TO THE TOP OF THE 8"X8" OPENING.
 3. HIP ROOFS MAY REQUIRE THE OPENINGS TO BE CUT FURTHER DOWN FROM ROOF RIDGE TO ALIGN W/ REQUIRED SIDE ROOF VENTS. SEE ROOF PLAN.
 4. ROOF SHEATHING TO BE REMOVED FROM UNDERNEATH OVER-FRAMED OR PERPENDICULAR ROOF SYSTEMS FOR PROPER AIR MOVEMENT.
 5. NO ROOF VENT OPENINGS WITHIN 36" OF ANY VALLEYS.

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A4	UPPER FLOOR PLAN AND OPTIONS
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A6	ELECTRICAL PLANS
A7	DETAILS
A8	4-SEASON PORCH OPTION
F1	FIREPLACE DETAILS
L1	LOWER LEVEL FINISH PLANS
TW1	TALL WALL DETAILS
S1	STRUCTURAL DETAILS
S2	STRUCTURAL DETAILS
S3	BRACED WALL DETAILS
S4	BRACED WALL DETAILS
S5	4-SEASON PORCH OPTION

SQUARE FOOTAGES

STOOP:	41 SQ. FT.
GARAGE:	725 SQ. FT.
BASEMENT UNFINISHED:	1176 SQ. FT.
MAIN FLOOR FINISHED:	1224 SQ. FT.
UPPER FLOOR FINISHED:	1458 SQ. FT.
TOTAL FINISHED:	2682 SQ. FT.
BASEMENT FINISH OPTION (SEE SHEET L1):	526 / 831 SQ. FT.
4-SEASON PORCH OPTION:	161 SQ. FT.

EXTERIOR NOTES

SIDING MATERIALS PER COMMUNITY SPECIFICATIONS.
STYLE PER PLAN.

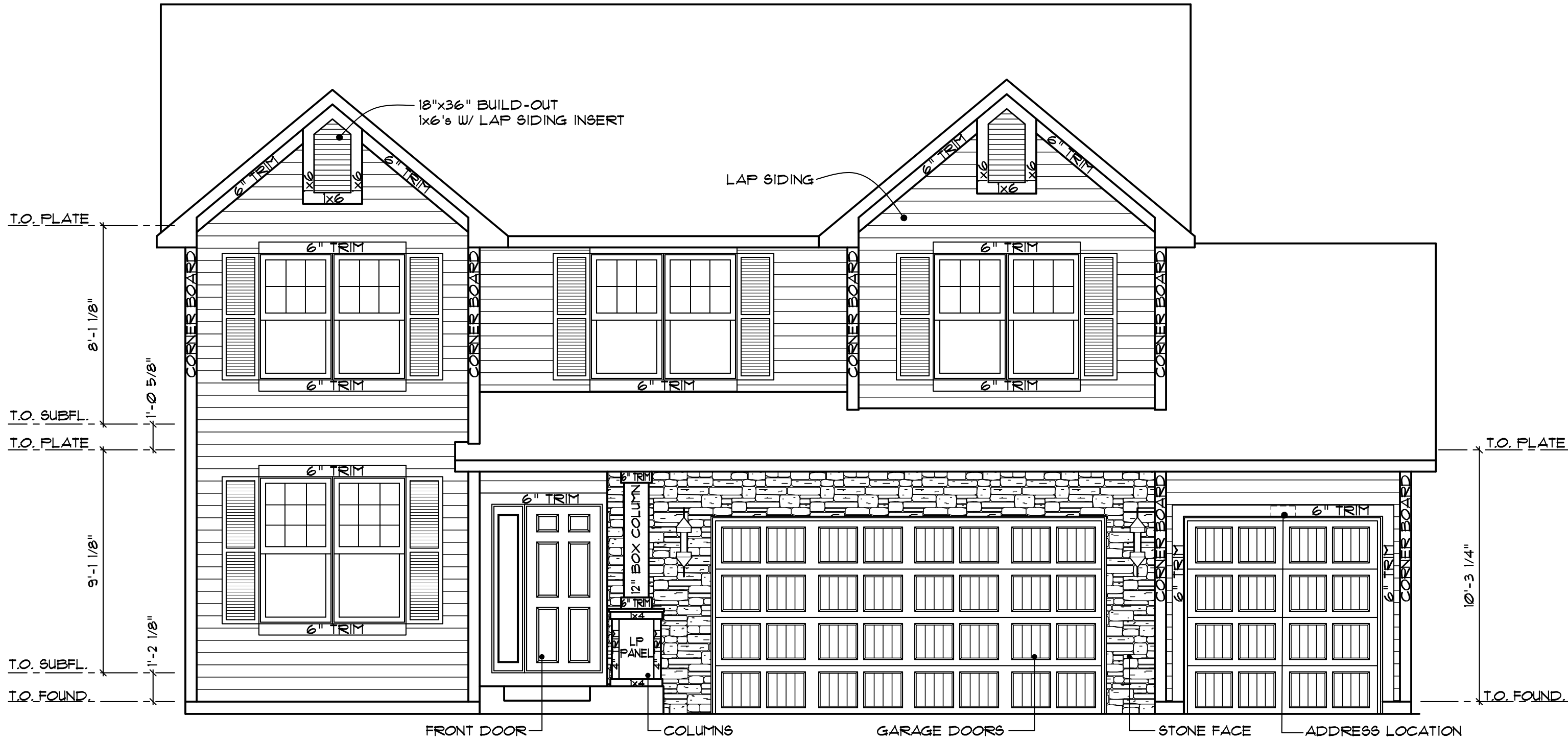
REPLACE 1/2" BUILT-RITE SHEATHING WITH 1/2" O.S.B.
SHEATHING BEHIND ALL VINYL AND LP BOARD 4 BATTEN
AND 7 OR SHAKE SIDING.

ALUMINUM FASCIA 4 SOFFIT ON ALL SIDES OF HOME,
INCLUDES PORCH CEILING

ALL TRIM MATERIALS SHOWN TO BE PER COMMUNITY
SPEC'S. TRIM SIZED PER PLAN.

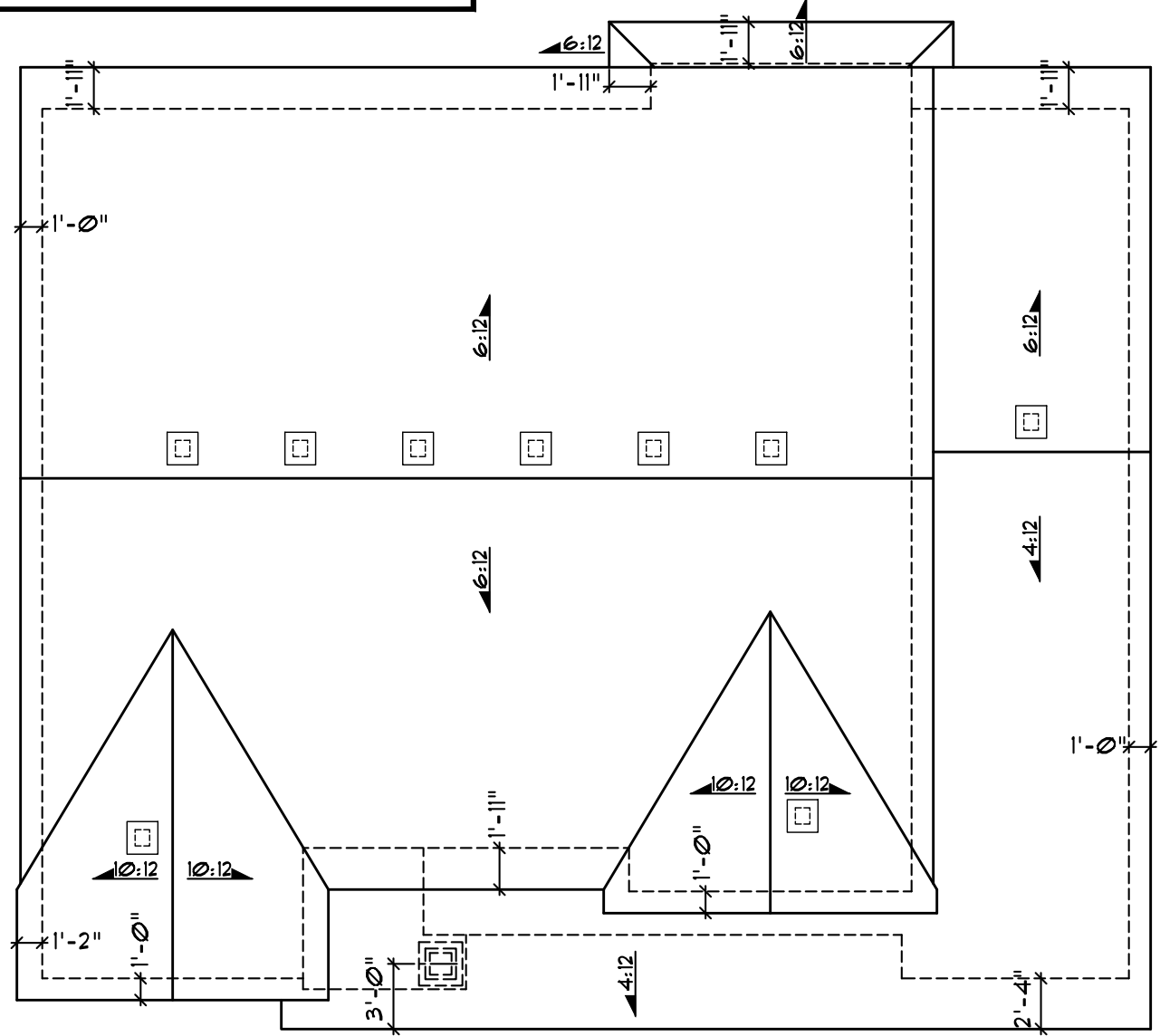
FOR 4 SIDED ARCHITECTURE ONLY: WRAP ALL WINDOWS
AT SIDES 4 REAR OF HOME W/ TRIM, PER PLAN AND
COMMUNITY SPECIFICATIONS.

INSTALL HOUSE WRAP AROUND ENTIRE HOME, SEE DETAIL
5/44 FOR INSTRUCTIONS ON WRAPPING THE WINDOWS



1 FRONT ELEVATION
SCALE: 1/4" = 1'- 0"

- ROOF VENT INSTALLATION NOTES:
1. ALL ROOF VENTS TO BE INSTALLED OVER 8" WIDE X 9" HIGH OPENINGS INTO THE ROOF SHEATHING.
 2. STANDARD LOCATION OF ROOF VENTS ON GABLE ROOFS TO BE 12" DOWN FROM THE ROOF RIDGE TO THE TOP OF THE 8"x8" OPENING.
 3. HIP ROOFS MAY REQUIRE THE OPENINGS TO BE CUT FURTHER DOWN FROM ROOF RIDGE TO ALLOW REQUIRED SIDE ROOF VENTS. SEE ROOF PLAN.
 4. ROOF SHEATHING TO BE REMOVED FROM UNDERNEATH OVER-FRAMED OR PERPENDICULAR ROOF SYSTEMS FOR PROPER AIR MOVEMENT.
 5. NO ROOF VENT OPENINGS WITHIN 36" OF ANY VALLEYS.



2 ROOF PLAN
SCALE: 1/8" = 1'- 0"



3 REAR ELEVATION
SCALE: 1/8" = 1'- 0"



3A LOOKOUT ELEVATION
SCALE: 1/8" = 1'- 0"



3B WALKOUT ELEVATION
SCALE: 1/8" = 1'- 0"



4 SIDE ELEVATION
SCALE: 1/8" = 1'- 0"



5 SIDE ELEVATION
SCALE: 1/8" = 1'- 0"

DATE: MARCH 2019
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REVISED: 02-01-2021
REVISED:

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LENNAR

GARAGE BUMP OPTION

OWNER: EH02 A3 - TAYLOR

PROJECT ADDRESS:
DEVELOPMENT:

LOT NO.
BLOCK NO.
ADDITION NO.

PN:
TITLE: ELEV
SHEET: A1

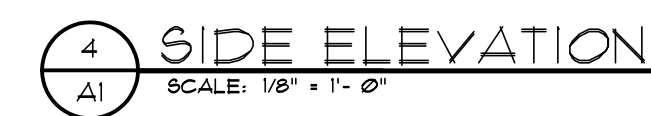
EI DISCOVERY SERIES
EK05 B4 - LEWIS - 4 CAR GARAGE

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A2	FOUNDATION PLAN & DETAILS
A3	MAIN AND UPPER FLOOR PLANS
A4	SECTIONS
A5	ELECTRICAL PLANS
A6	DETAILS
F1	FIREPLACE DETAILS
L1	LOWER LEVEL FINISH PLANS

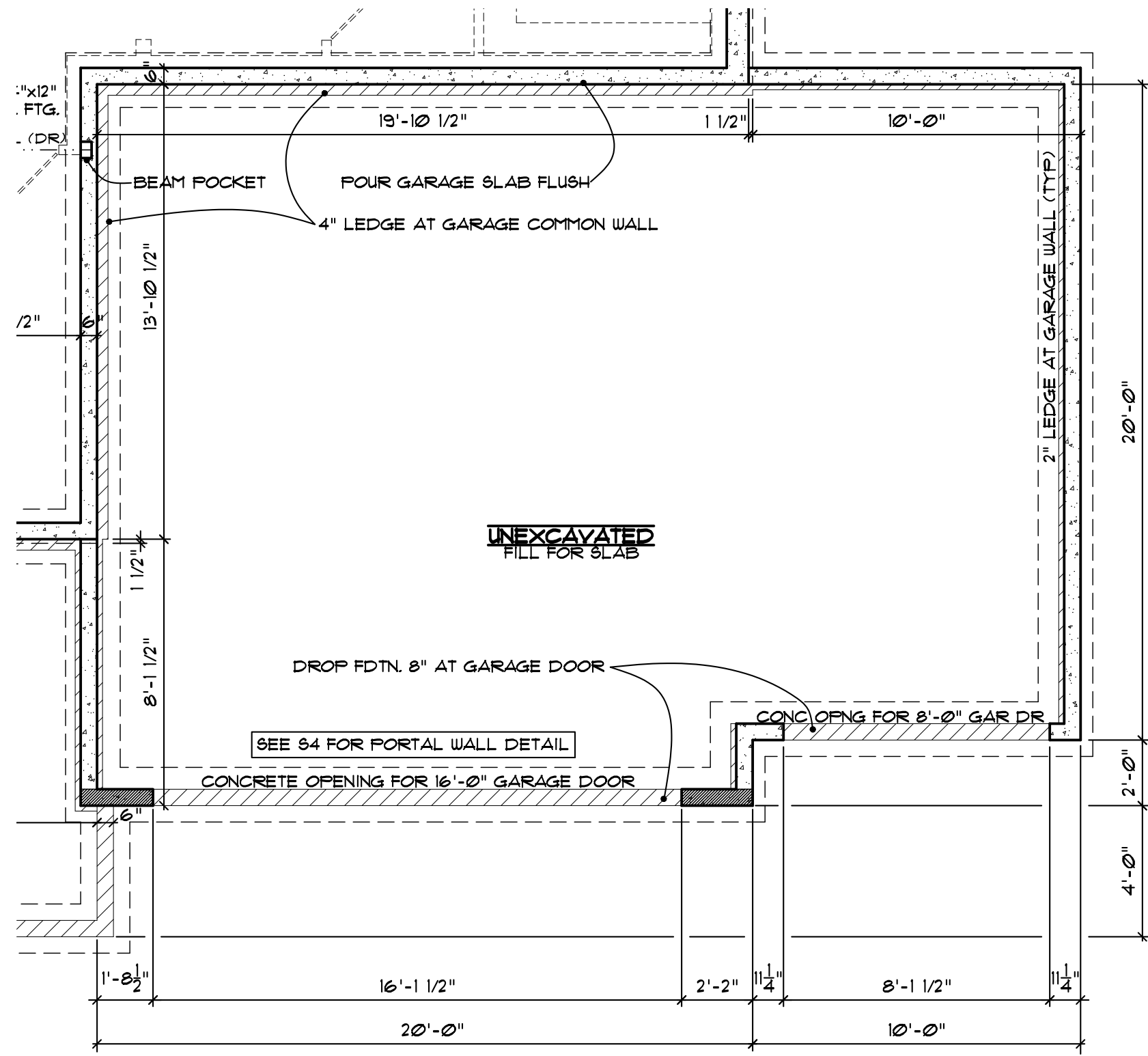
SQUARE FOOTAGES

EXTERIOR NOTES

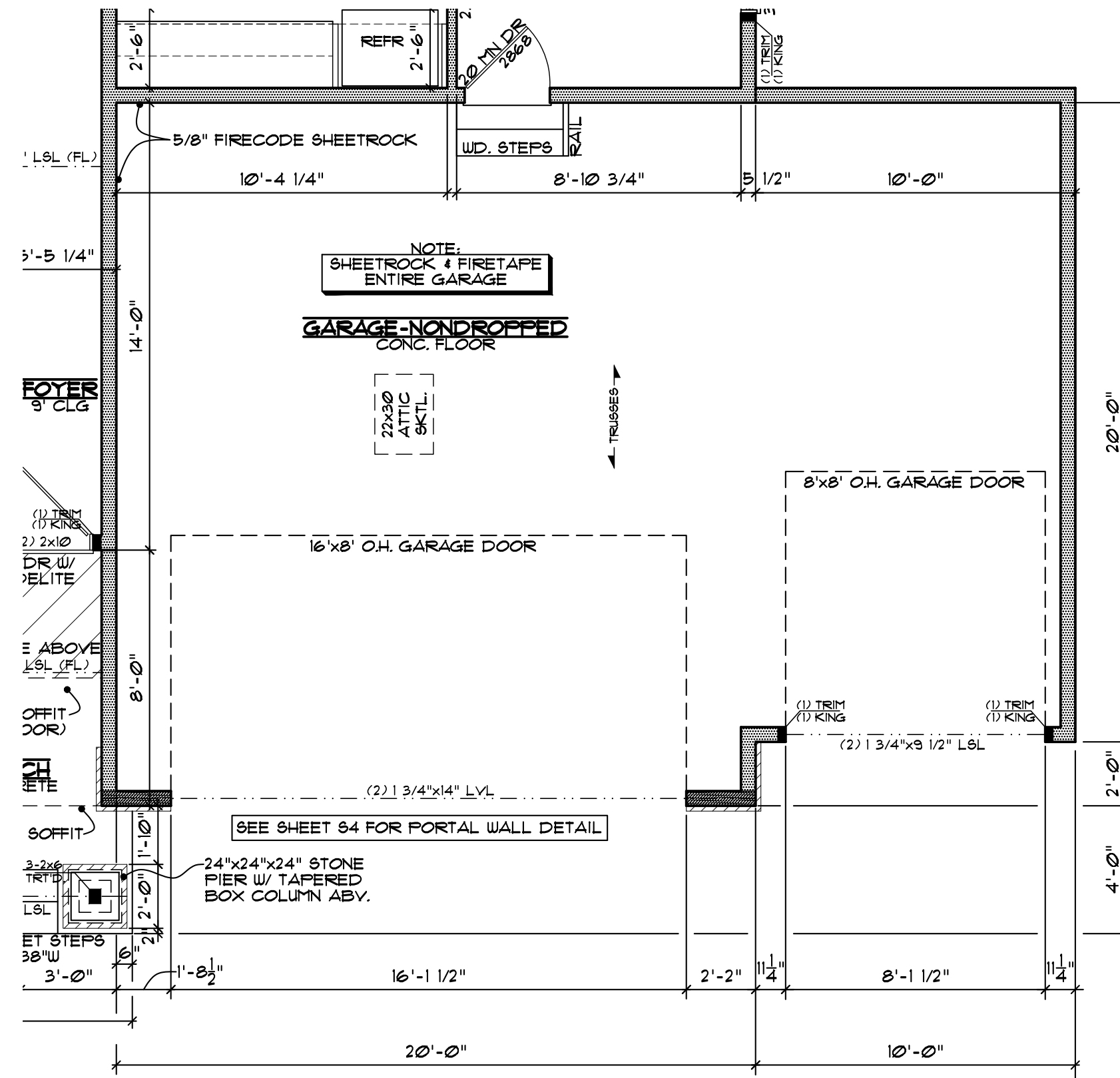
INSTALL HOUSE WRAP AROUND ENTIRE HOME, SEE DETAIL
ON A4 FOR INSTRUCTIONS ON WRAPPING THE WINDOWS



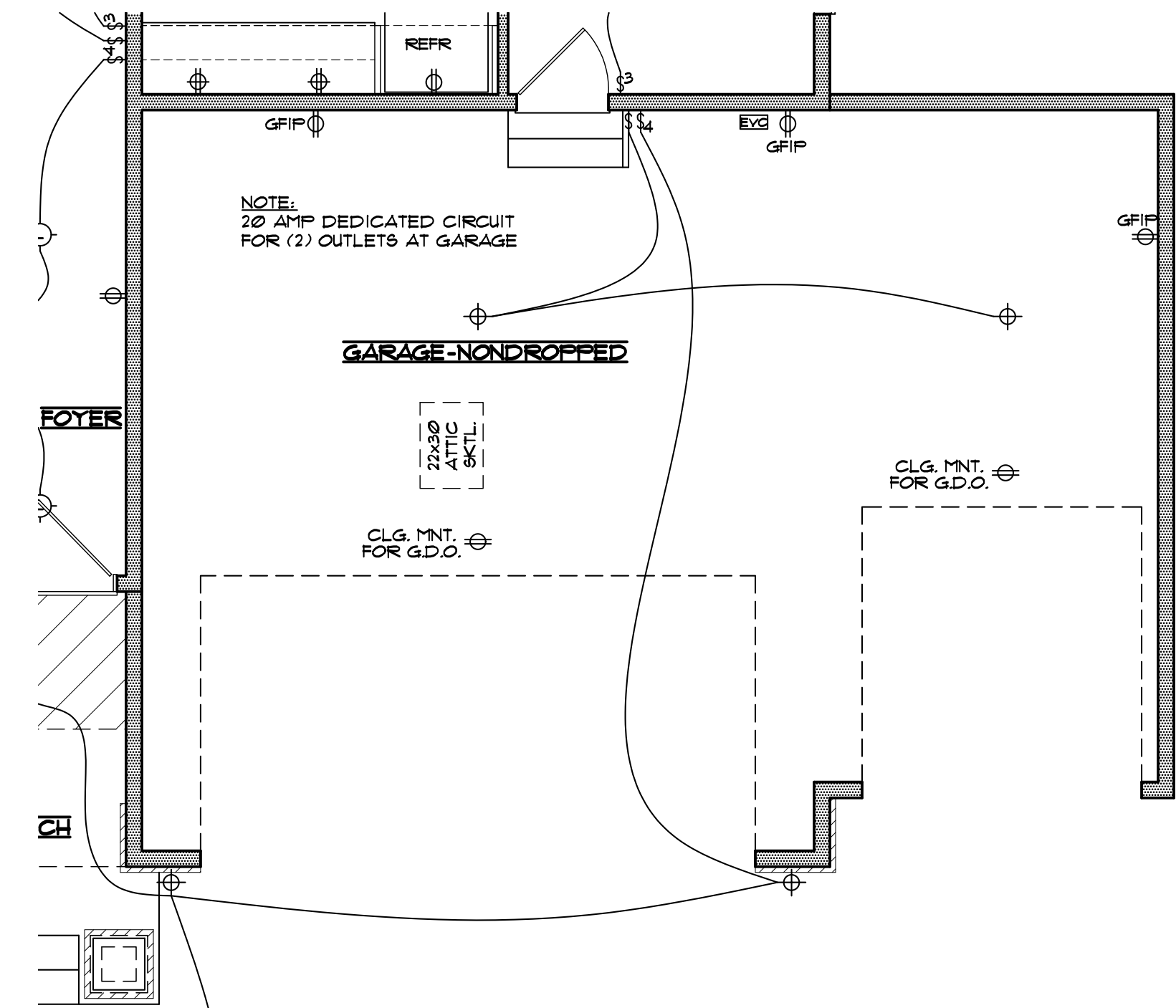
PN:
TITLE: ELEV
SHEET: A1



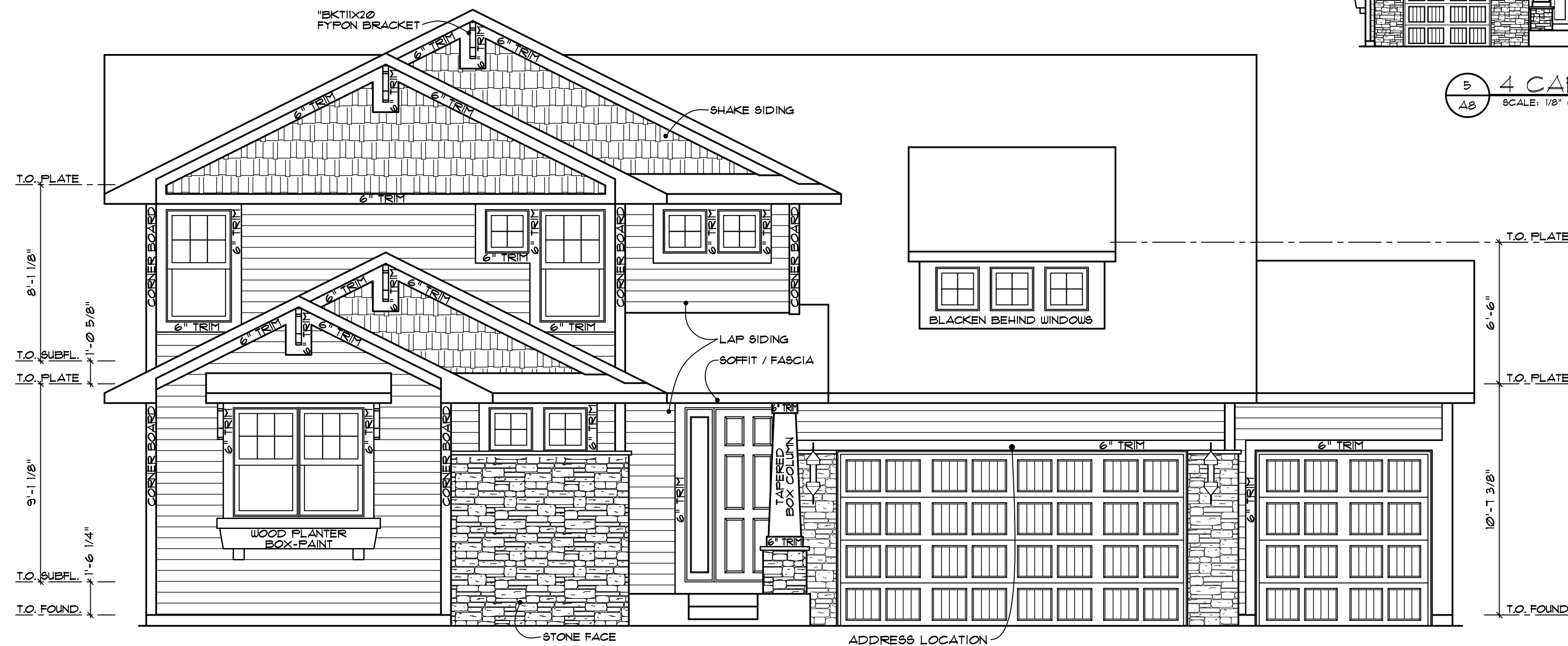
1 4 CAR GARAGE FOUNDATION PLAN
SCALE: 1/4" = 1'-0"



2 4 CAR GARAGE FLOOR PLAN
SCALE: 1/4" = 1'-0"



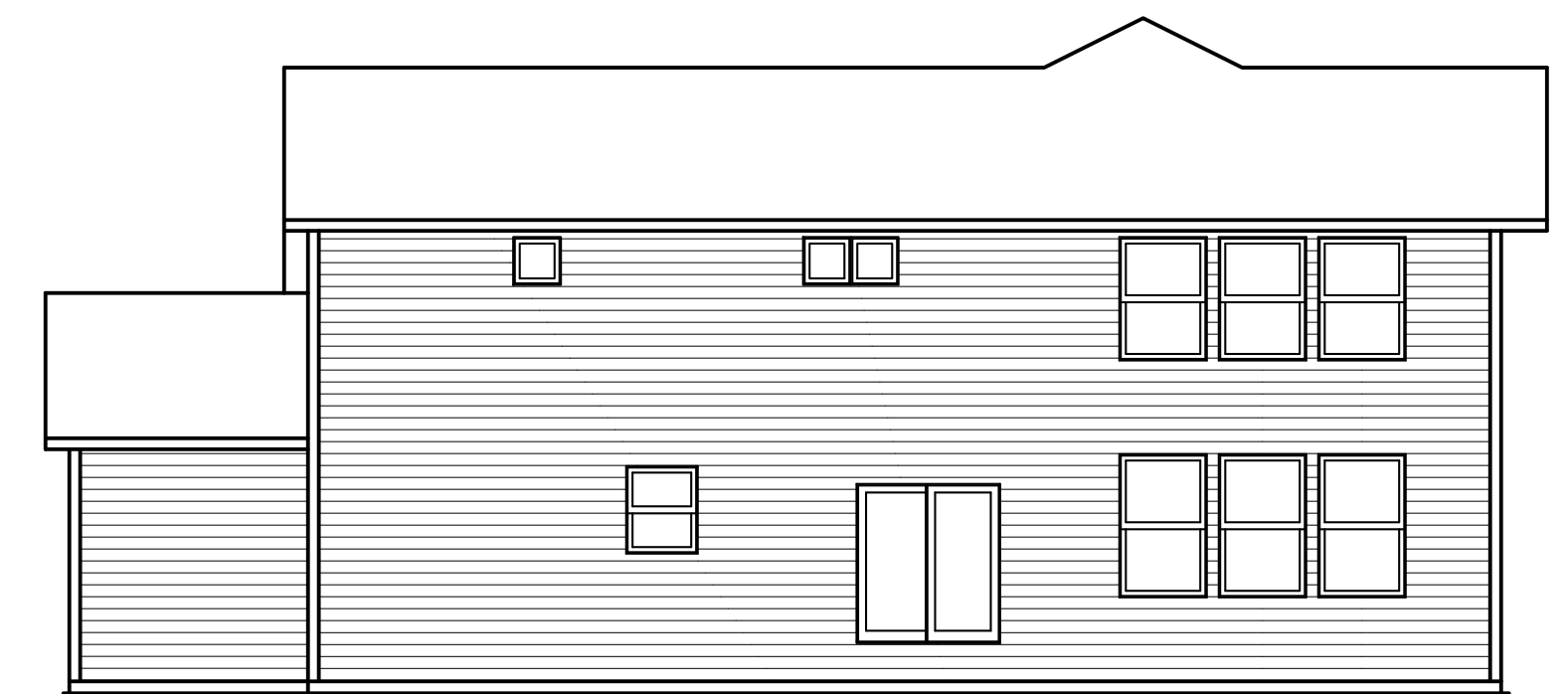
3 4 CAR GARAGE ELECTRICAL PLAN
SCALE: 1/4" = 1'-0"



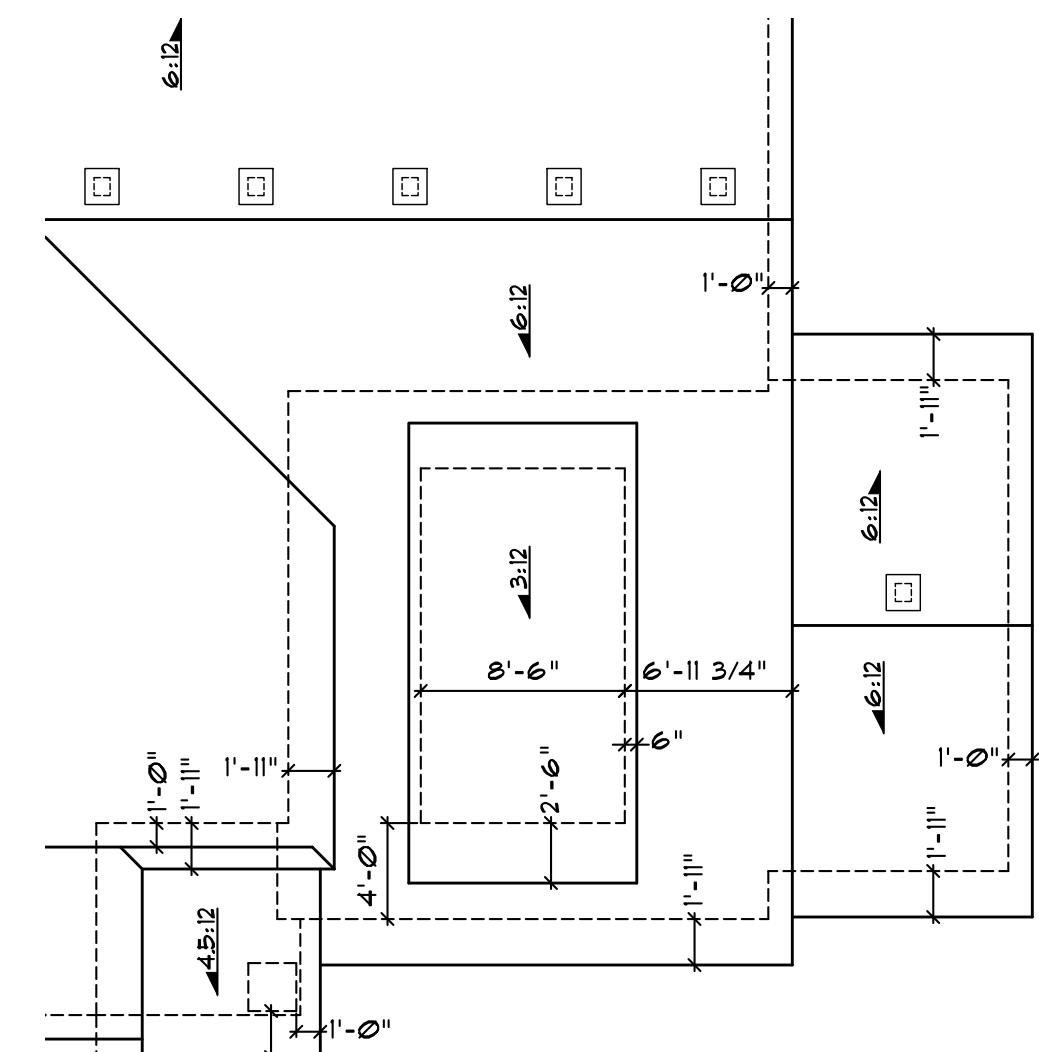
4 4 CAR GARAGE FRONT ELEVATION
SCALE: 1/4" = 1'-0"



5 4 CAR GARAGE SIDE ELEVATION
SCALE: 1/8" = 1'-0"



6 4 CAR GARAGE REAR ELEVATION
SCALE: 1/8" = 1'-0"



7 4 CAR GARAGE ROOF PLAN
SCALE: 1/8" = 1'-0"

DATE: JULY 2019
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REVISED:

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LENNAR

OWNER: EM01 A - INDEPENDENCE
PROJECT ADDRESS:
DEVELOPMENT: STANDARD HOME WITH 4 CAR GARAGE OPTION

LOT NO.
BLOCK NO.
ADDITION NO.

PN:
TITLE: 4 CAR
SHEET: A8

LENNAR

LANDMARK SERIES
EH06 D4 - SNELLING

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S2	STRUCTURAL DETAILS
S41	FOUNDATION FOOTINGS
S3	BRACED WALL DETAILS
S4	BRACED WALL DETAILS
S5	4-SEASON PORCH OPTION

SQUARE FOOTAGES

STOOP:	151 SQ. FT.
GARAGE:	888 SQ. FT.
BASEMENT UNFINISHED:	1,600 SQ. FT.
MAIN FLOOR FINISHED:	1,600 SQ. FT.
UPPER FLOOR FINISHED:	1,836 SQ. FT.
TOTAL FINISHED:	3,436 SQ. FT.
OPTIONAL BASEMENT FINISH: (SEE L1)	1,390 SQ. FT.
4-SEASON PORCH OPTION:	154 SQ. FT.

EXTERIOR NOTES

SIDING MATERIALS PER COMMUNITY SPECIFICATIONS.
STYLE PER PLAN.

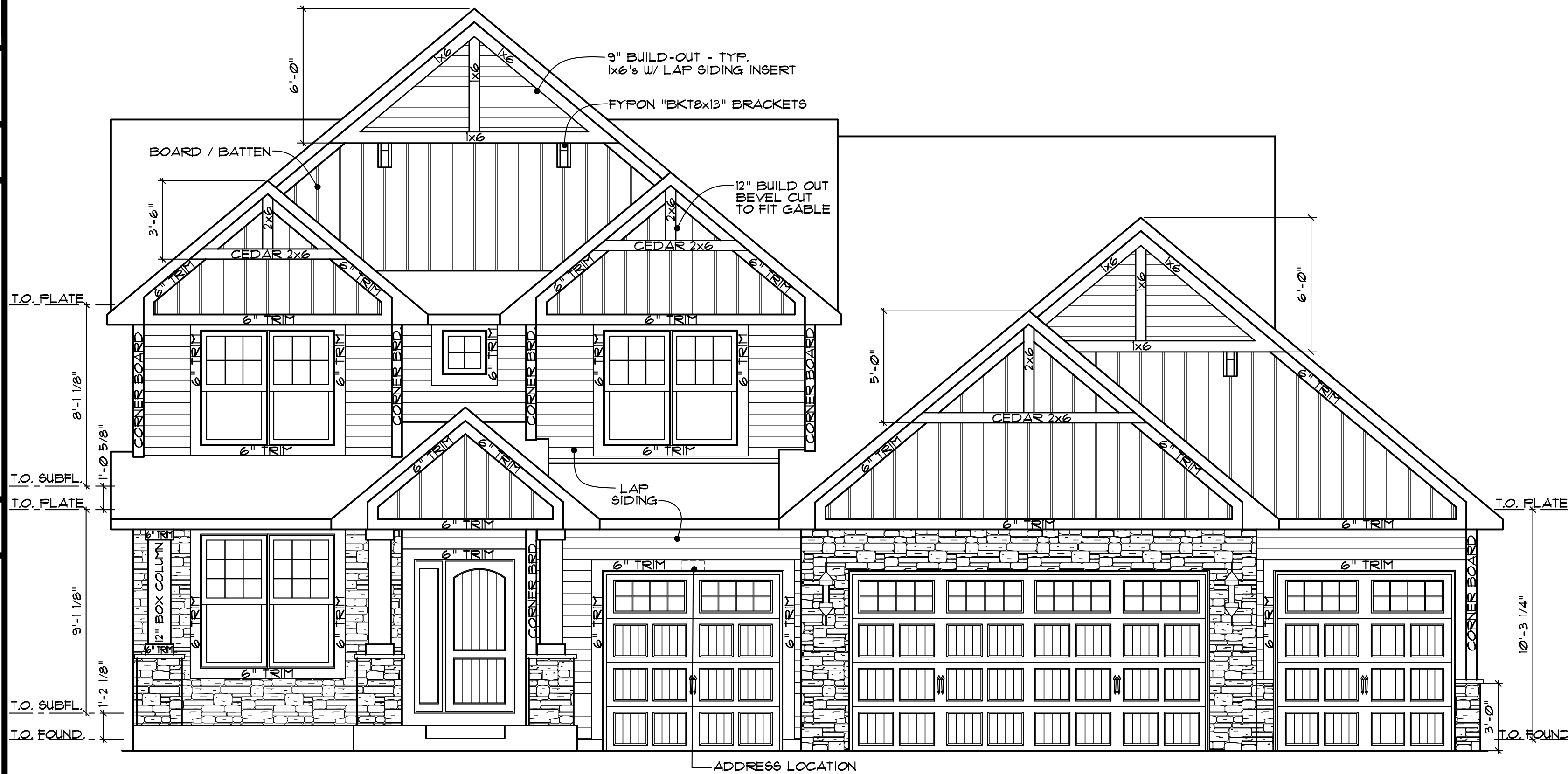
REPLACE 1/2" BUILT-RITE SHEATHING WITH 1/2" O.S.B.
SHEATHING BEHIND ALL VINYL AND LP BOARD & BATTEN
AND / OR SHAKE SIDING.

ALUMINUM FASCIA & SOFFIT ON ALL SIDES OF HOME,
INCLUDES PORCH CEILING

ALL TRIM MATERIALS SHOWN TO BE PER COMMUNITY
SPEC'S. TRIM SIZED PER PLAN.

PER PLAN AND COMMUNITY SPECIFICATIONS ONLY:
WRAP ALL WINDOWS AT SIDES & REAR OF HOME W/ TRIM

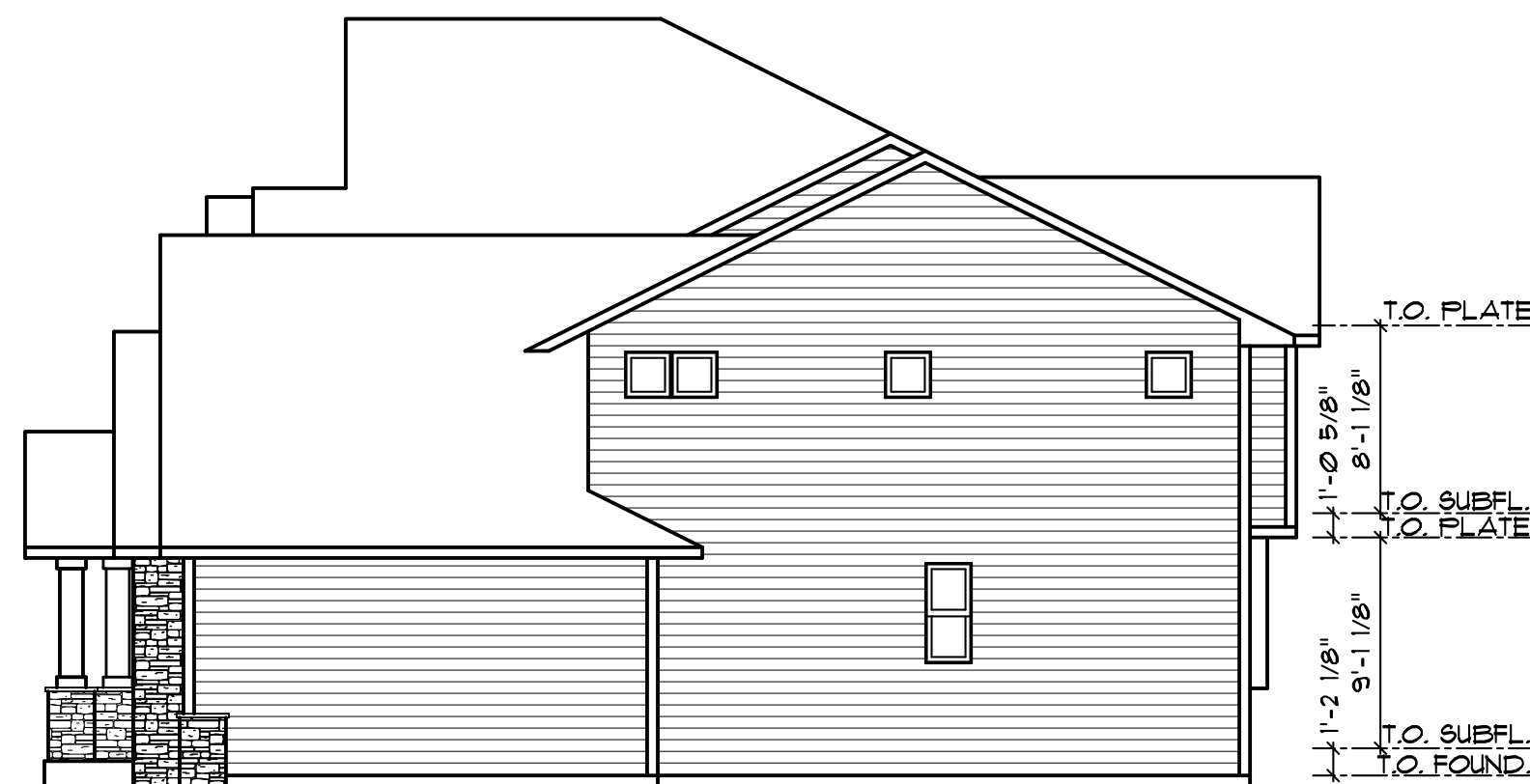
INSTALL HOUSE WRAP AROUND ENTIRE HOME, SEE DETAIL
6/A5 FOR INSTRUCTIONS ON WRAPPING THE WINDOWS



1 FRONT ELEVATION
A1 SCALE: 1/4" = 1'-0"



3 SIDE ELEVATION
A1 SCALE: 1/8" = 1'-0"



4 SIDE ELEVATION
A1 SCALE: 1/8" = 1'-0"



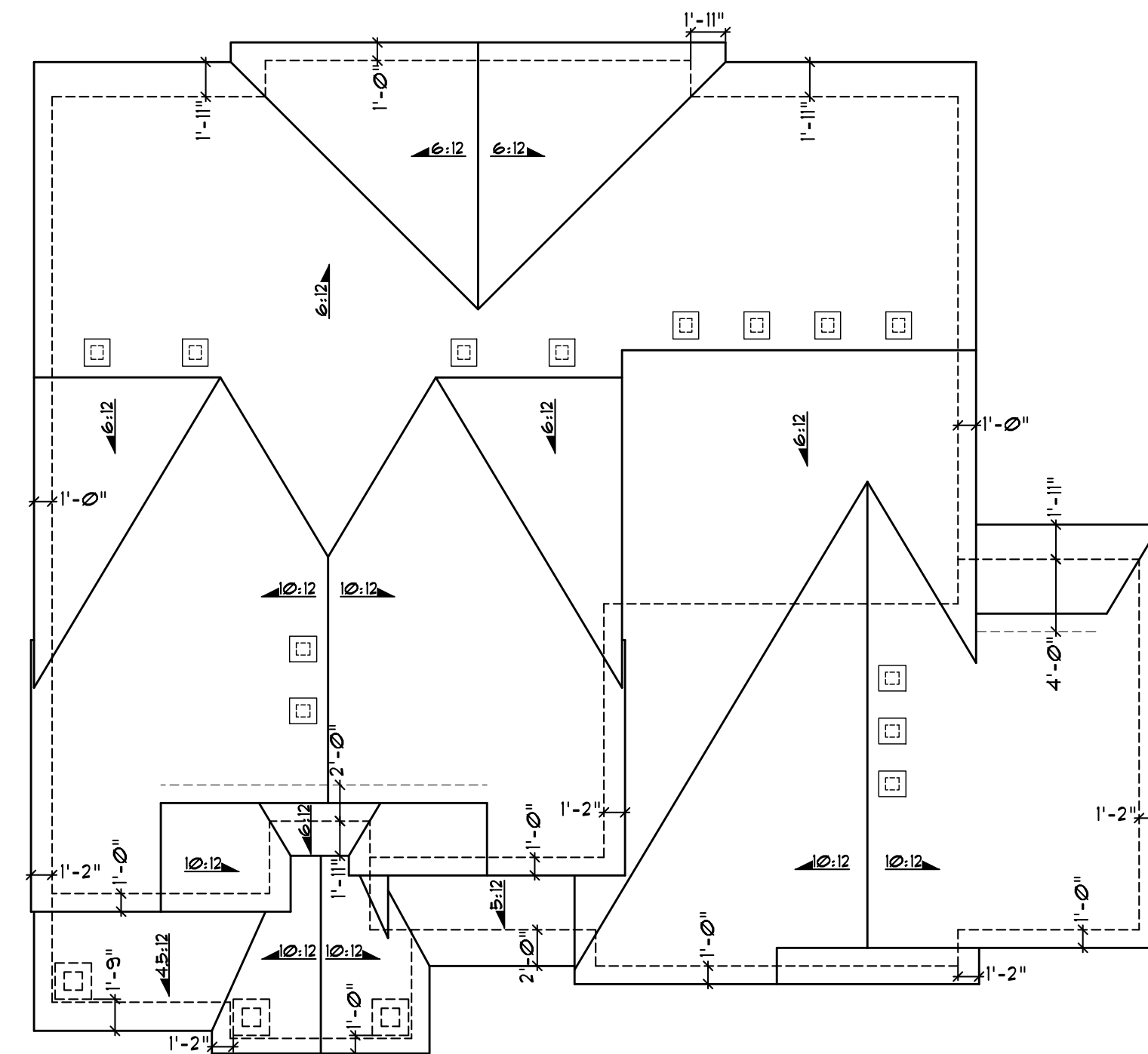
5 REAR ELEVATION
A1 SCALE: 1/8" = 1'-0"



5A LOOKOUT ELEVATION
A1 SCALE: 1/8" = 1'-0"



5B WALKOUT ELEVATION
A1 SCALE: 1/8" = 1'-0"



2 ROOF PLAN
A1 SCALE: 1/8" = 1'-0"

- ROOF VENT INSTALLATION NOTES:
1. ALL ROOF VENTS TO BE INSTALLED OVER 8" WIDE x 9" HIGH OPENINGS INTO THE ROOF SHEATHING.
 2. STANDARD LOCATION OF ROOF VENTS ON GABLE ROOFS TO BE 12" DOWN FROM THE ROOF RIDGE TO THE TOP OF THE 8"x9" OPENING.
 3. HIP ROOFS MAY REQUIRE THE OPENING TO BE CUT FURTHER DOWN FROM ROOF RIDGE TO ALIGN W/ REQUIRED SIDE ROOF VENTS. SEE ROOF PLAN.
 4. ROOF SHEATHING TO BE REMOVED FROM UNDERNEATH OVER-FRAMED OR PERPENDICULAR ROOF SYSTEMS FOR PROPER AIR MOVEMENT.
 5. NO ROOF VENT OPENINGS WITHIN 36" OF ANY VALLEYS.

DATE: JANUARY 2020
DRAWN BY:
REVISD: 05-01-2021
REVISED:

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LENNAR

OWNER: EH06 D4 - SNELLING
PROJECT ADDRESS:
DEVELOPMENT:

LOT NO.
BLOCK NO.
ADDITION NO.

PN:
TITLE: ELEV
SHEET: A1

INDEX

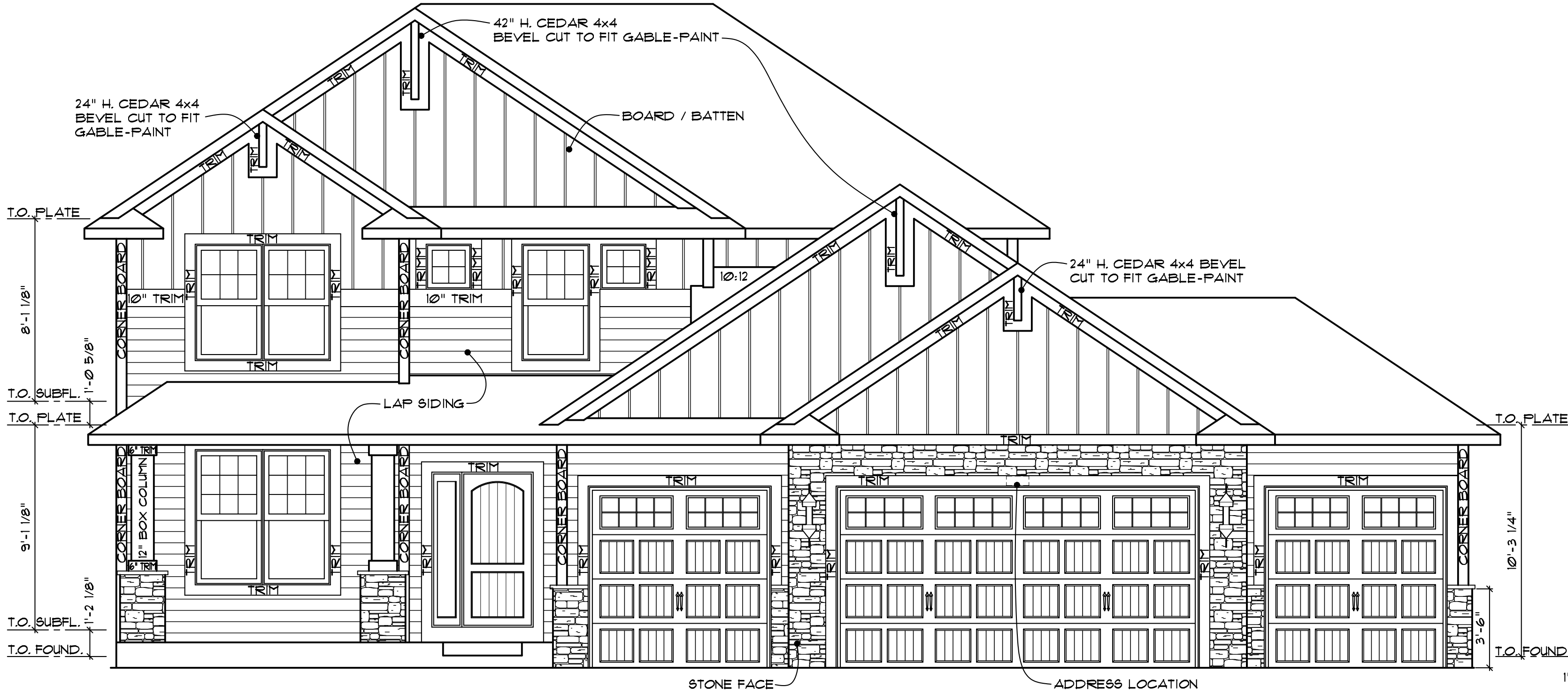
A1	ELEVATIONS, ROOF PLAN, NOTES
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A3	MAIN AND UPPER FLOOR PLANS
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A6	DETAILS
F1	FIREPLACE DETAILS
L1	LOWER LEVEL FINISH PLANS
S1	STRUCTURAL DETAILS
S2	STRUCTURAL DETAILS
S3	BRACED WALL DETAILS
S4	BRACED WALL DETAILS

SQUARE FOOTAGES

STOOP:	130 SQ. FT.
GARAGE:	853 SQ. FT.
BASEMENT UNFINISHED:	1226 SQ. FT.
MAIN FLOOR FINISHED:	1226 SQ. FT.
UPPER FLOOR FINISHED:	1,480 SQ. FT.
TOTAL FINISHED:	2,706 SQ. FT.
BASEMENT FINISH OPTION (SEE SHEET L1):	791 SQ. FT.
OTHER:	N/A

EXTERIOR NOTES

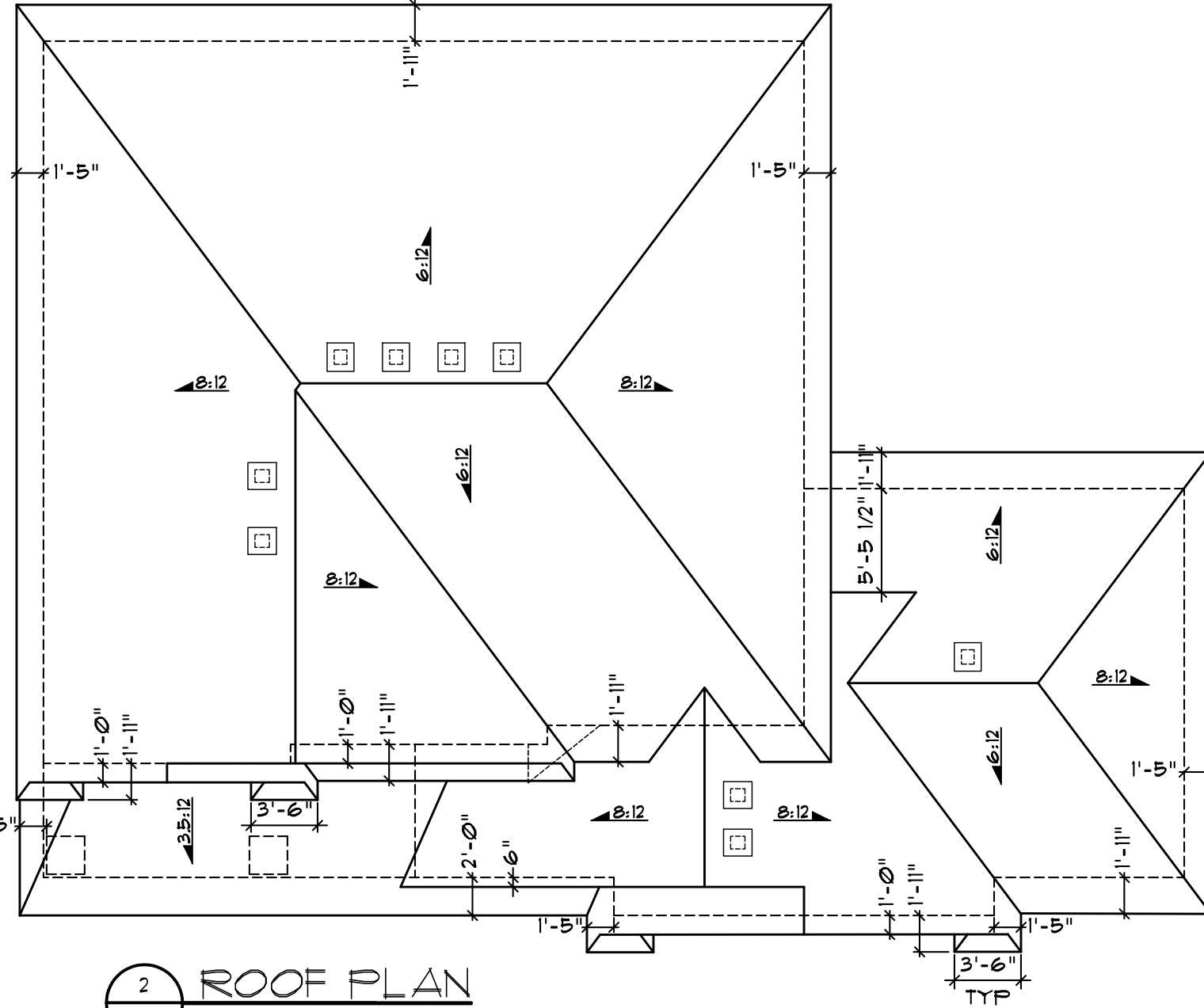
- SIDING MATERIALS PER COMMUNITY SPECIFICATIONS.
STYLE PER PLAN.
- REPLACE 1/2" BUILT-RITE SHEATHING WITH 1/2" O.S.B.
SHEATHING BEHIND ALL VINYL AND LP BOARD & BATTEN
AND / OR SHAKE SIDING.
- ALUMINUM FASCIA & SOFFIT ON ALL SIDES OF HOME,
INCLUDES PORCH CEILING
- ALL TRIM MATERIALS SHOWN TO BE PER COMMUNITY
SPECIFICATIONS. TRIM SIZED PER PLAN.
- PER PLAN AND COMMUNITY SPECIFICATIONS ONLY:
WRAP ALL WINDOWS AT SIDES & REAR OF HOME W/ TRIM
- INSTALL HOUSE WRAP AROUND ENTIRE HOME, SEE DETAIL
ON A4 FOR INSTRUCTIONS ON WRAPPING THE WINDOWS



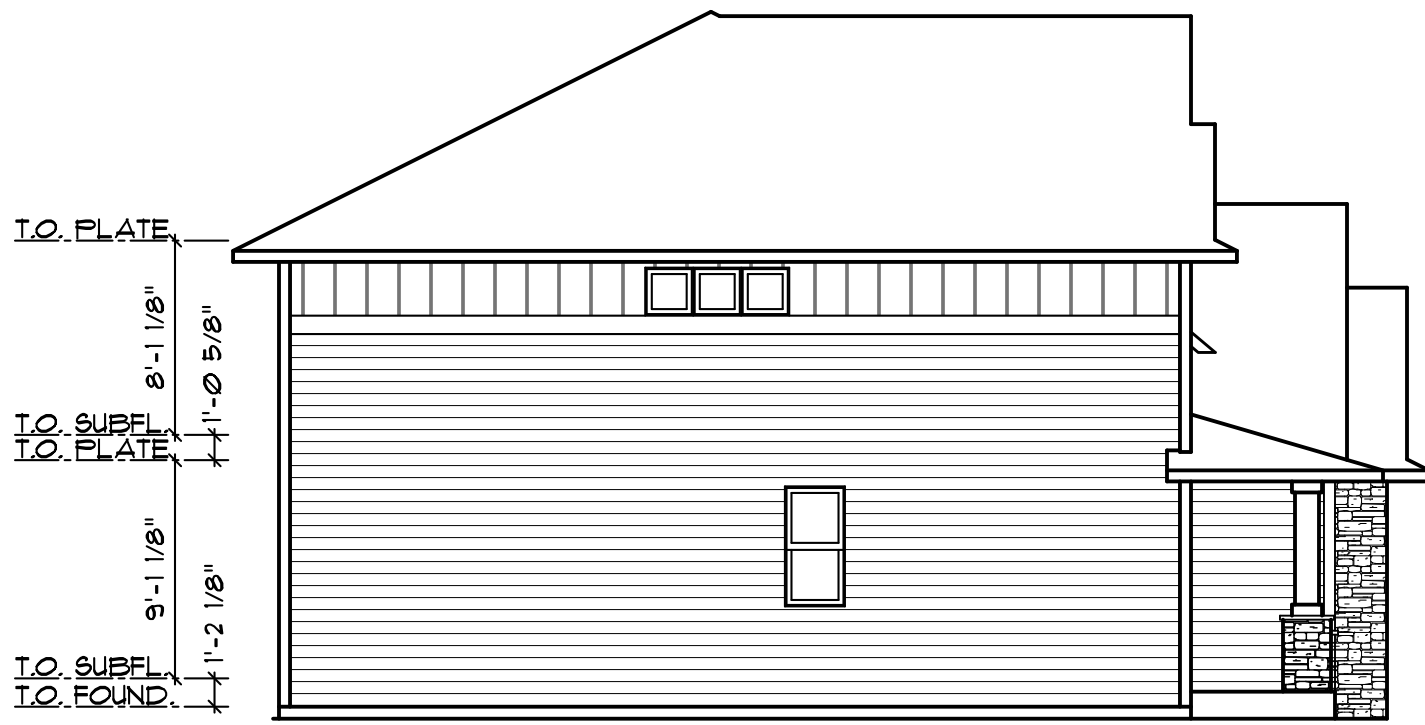
1 FRONT ELEVATION
SCALE: 1/4" = 1'-0"

ROOF VENT INSTALLATION NOTES:

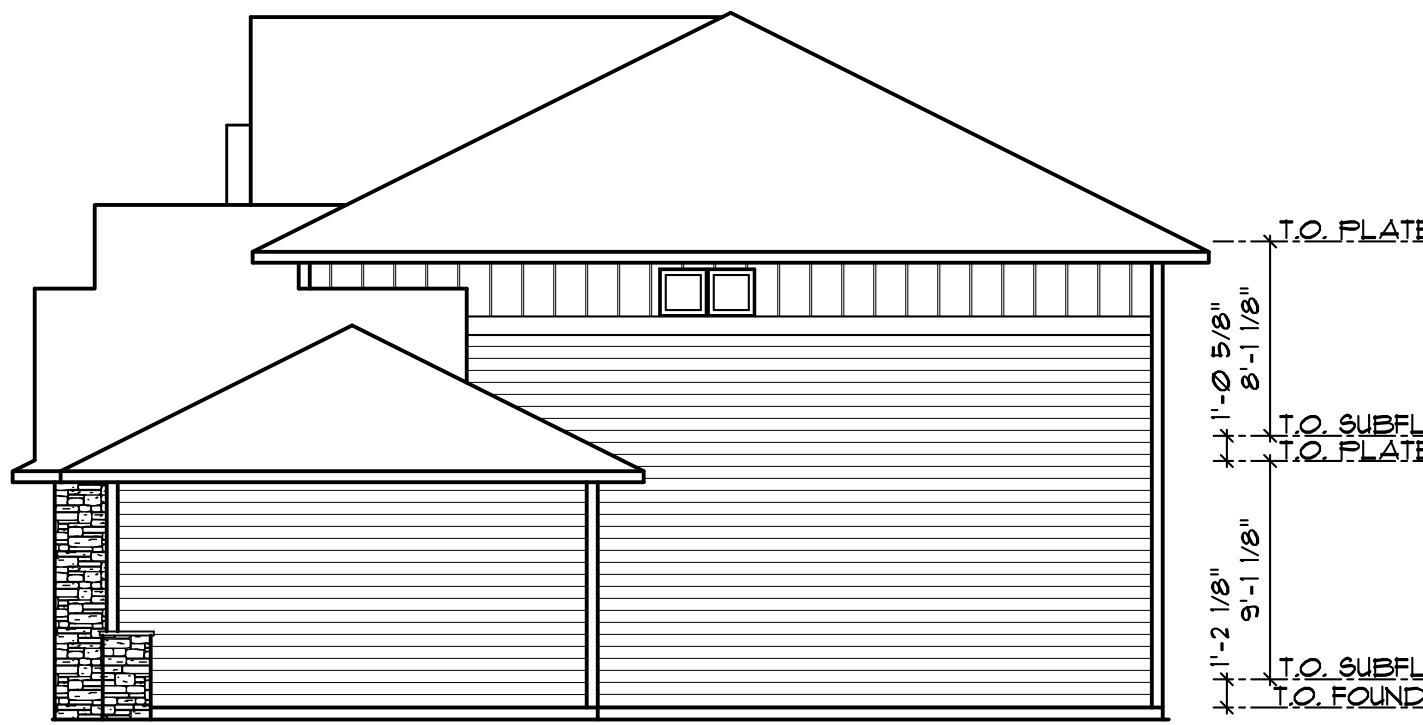
1. ALL ROOF VENTS TO BE INSTALLED OVER 8" WIDE X 9" HIGH OPENINGS INTO THE ROOF SHEATHING.
2. STANDARD LOCATION OF ROOF VENTS ON GABLE ROOFS TO BE 12" DOWN FROM THE ROOF RIDGE TO THE TOP OF THE 8"x9" OPENING.
3. HIP ROOFS MAY REQUIRE THE OPNG'S. TO BE CUT FURTHER DOWN FROM ROOF RIDGE TO ALIGN W/ REQUIRED SIDE ROOF VENTS. SEE ROOF PLAN.
4. ROOF SHEATHING TO BE REMOVED FROM UNDERNEATH OVER-FRAMED OR PERPENDICULAR ROOF SYSTEMS FOR PROPER AIR MOVEMENT.
5. NO ROOF VENT OPENINGS WITHIN 36" OF ANY VALLEYS.



2 ROOF PLAN
SCALE: 1/8" = 1'-0"



3 SIDE ELEVATION
SCALE: 1/8" = 1'-0"



4 SIDE ELEVATION
SCALE: 1/8" = 1'-0"



5 REAR ELEVATION
SCALE: 1/8" = 1'-0"



5A LOOKOUT ELEVATION
SCALE: 1/8" = 1'-0"



5B WALKOUT ELEVATION
SCALE: 1/8" = 1'-0"

DATE: JANUARY 2019
DRAWN BY:
REVISED: 05-01-2021
REVISED:

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LENNAR

OWNER: EK05 D4 - LEWIS
PROJECT ADDRESS:
DEVELOPMENT:

LOT NO.
BLOCK NO.
ADDITION NO.

PN:
TITLE: ELEV
SHEET: A1

LENNAR

LANDMARK SERIES
EH07 A4 - SUMMIT

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L1	LOWER LEVEL FINISH PLANS
S1	STRUCTURAL DETAILS
S2	STRUCTURAL DETAILS
S3	BRACED WALL DETAILS
S4	BRACED WALL DETAILS
S5	4-SEASON PORCH OPTION

SQUARE FOOTAGES

STOOP:	156 SQ. FT.
GARAGE:	878 SQ. FT.
BASEMENT UNFINISHED:	1,462 SQ. FT.
MAIN FLOOR FINISHED:	1,462 SQ. FT.
UPPER FLOOR FINISHED:	1,564 SQ. FT.
TOTAL FINISHED:	3,026 SQ. FT.
OPTIONAL BASEMENT FINISH:	1,223 SQ. FT.
4-SEASON PORCH:	168 SQ. FT.

EXTERIOR NOTES

SIDING MATERIALS PER COMMUNITY SPECIFICATIONS.
STYLE PER PLAN.

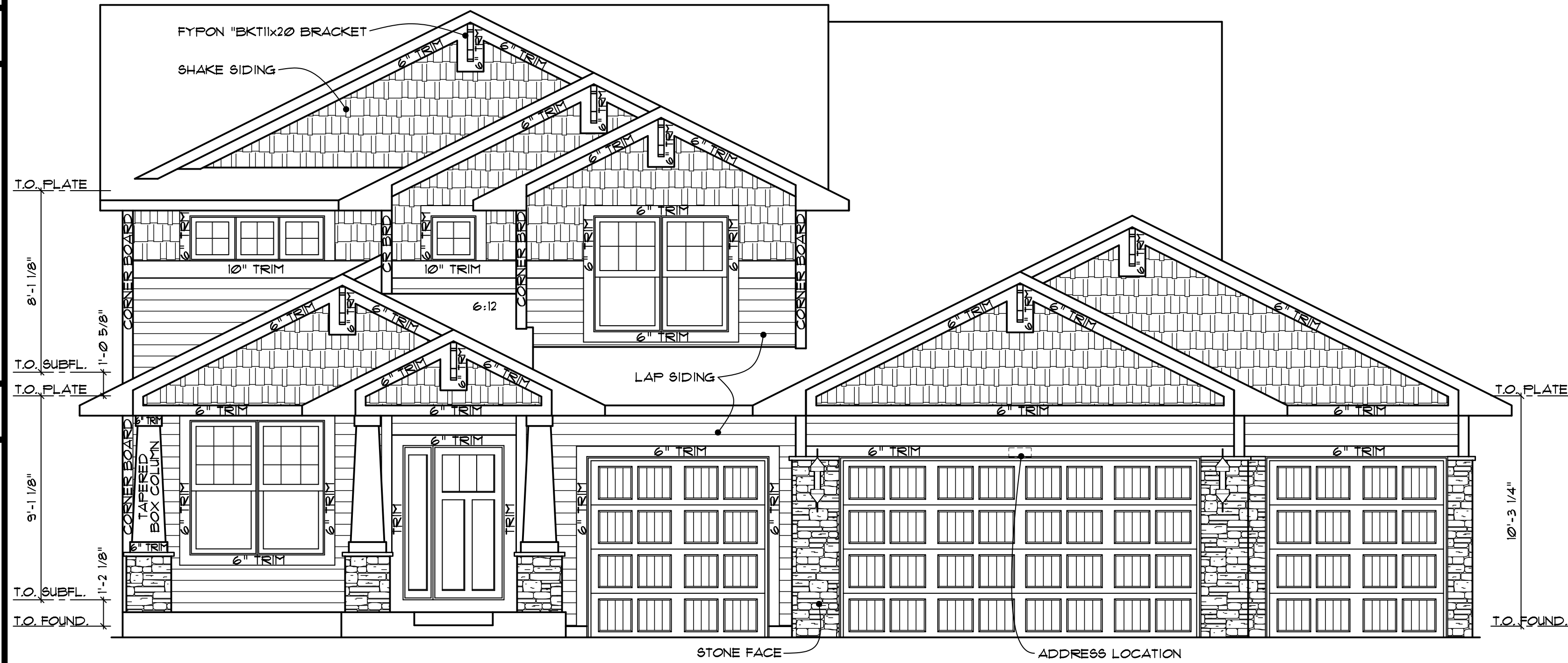
REPLACE 1/2" BUILT-RITE SHEATHING WITH 1/2" O.S.B.
SHEATHING BEHIND ALL VINYL AND LP BOARD & BATTEN
AND / OR SHAKE SIDING.

ALUMINUM FASCIA & SOFFIT ON ALL SIDES OF HOME,
INCLUDES PORCH CEILING

ALL TRIM MATERIALS SHOWN TO BE PER COMMUNITY
SPEC'S. TRIM SIZED PER PLAN.

PER PLAN AND COMMUNITY SPECIFICATIONS ONLY:
WRAP ALL WINDOWS AT SIDES & REAR OF HOME W/ TRIM

INSTALL HOUSE WRAP AROUND ENTIRE HOME, SEE DETAIL
6/A5 FOR INSTRUCTIONS ON WRAPPING THE WINDOWS



1 FRONT ELEVATION
SCALE: 1/4" = 1'-0"



3 SIDE ELEVATION
SCALE: 1/8" = 1'-0"



4 SIDE ELEVATION
SCALE: 1/8" = 1'-0"



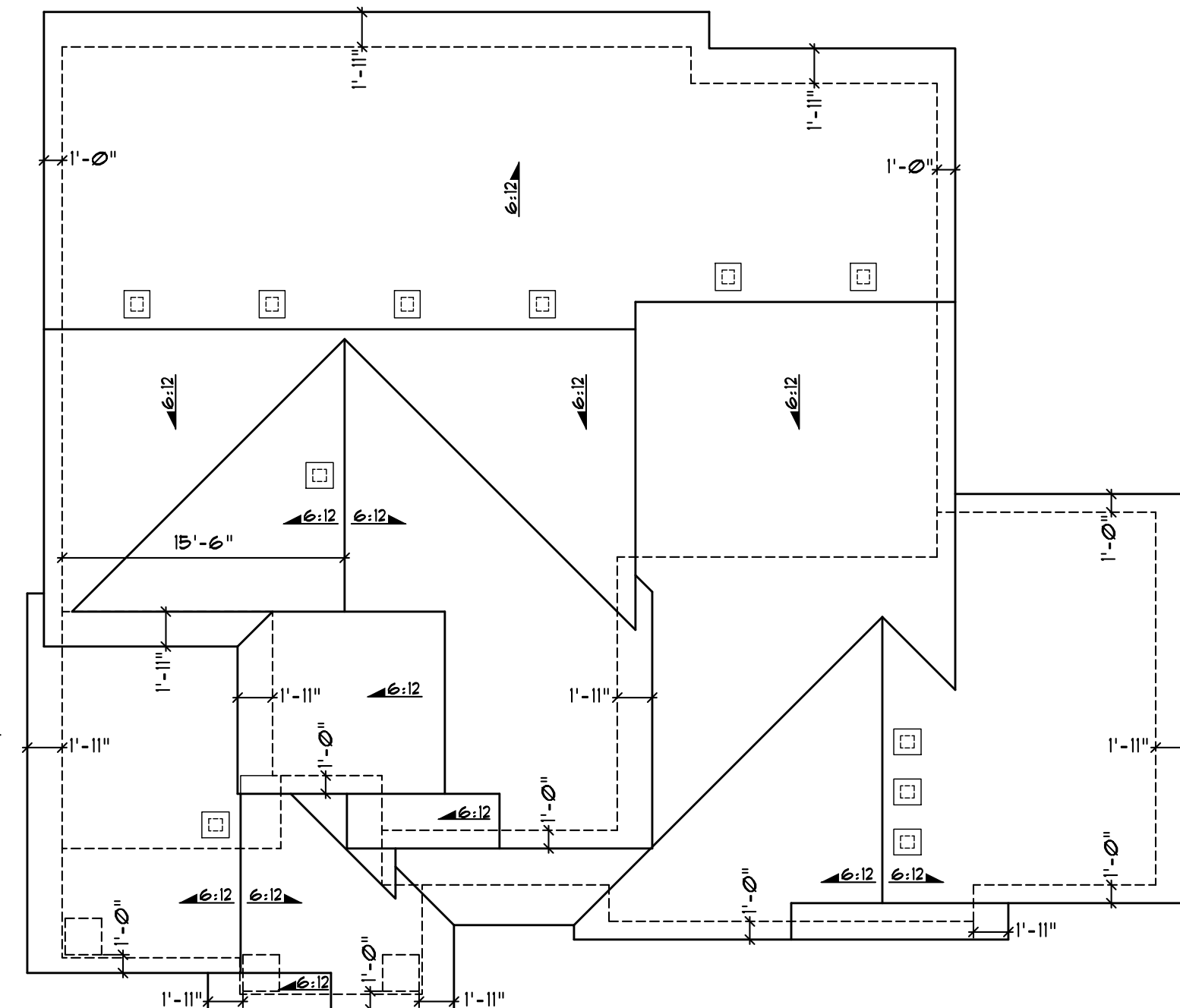
5 REAR ELEVATION
SCALE: 1/8" = 1'-0"



5A LOOKOUT ELEVATION
SCALE: 1/8" = 1'-0"



5B WALKOUT ELEVATION
SCALE: 1/8" = 1'-0"



2 ROOF PLAN
SCALE: 1/8" = 1'-0"

- ROOF VENT INSTALLATION NOTES:
1. ALL ROOF VENTS TO BE INSTALLED OVER 8" WIDE X 9" HIGH OPENINGS INTO THE ROOF SHEATHING.
 2. STANDARD LOCATION OF ROOF VENTS ON GABLE ROOFS TO BE 12" DOWN FROM THE ROOF RIDGE TO THE TOP OF THE 8"x9" OPENING.
 3. HIP ROOFS MAY REQUIRE THE OPENINGS TO BE CUT FURTHER DOWN FROM ROOF RIDGE TO ALIGN W/ REQUIRED SIDE ROOF VENTS. SEE ROOF PLAN.
 4. ROOF SHEATHING TO BE REMOVED FROM UNDERNEATH OVER-FRAMED OR PERPENDICULAR ROOF SYSTEMS FOR PROPER AIR MOVEMENT.
 5. NO ROOF VENT OPENINGS WITHIN 36" OF ANY VALLEYS.

DATE: FEBRUARY 2020
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REVISD: 05-01-2021
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LENNAR

OWNER: EH07 A4 - SUMMIT
PROJECT ADDRESS:
DEVELOPMENT:

LOT NO.
BLOCK NO.
ADDITION NO.

PN:
TITLE: ELEV
SHEET: A1

LENNAR

LANDMARK SERIES
EH05 C4 - WASHBURN

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L1	LOWER LEVEL FINISH PLANS
S1	STRUCTURAL DETAILS
S2	STRUCTURAL DETAILS
S3	BRACED WALL DETAILS
S4	BRACED WALL DETAILS
S5	4-SEASON PORCH OPTION

SQUARE FOOTAGES

STOOP:	158 SQ. FT.
GARAGE:	951 SQ. FT.
BASEMENT UNFINISHED:	1494 SQ. FT.
MAIN FLOOR FINISHED:	1494 SQ. FT.
UPPER FLOOR FINISHED:	1834 SQ. FT.
TOTAL FINISHED:	3328 SQ. FT.
BASEMENT FINISH OPTION (SEE SHEET L1):	1076 SQ. FT.
4-SEASON PORCH OPTION:	168 SQ. FT.

EXTERIOR NOTES

SIDING MATERIALS PER COMMUNITY SPECIFICATIONS.
STYLE PER PLAN.

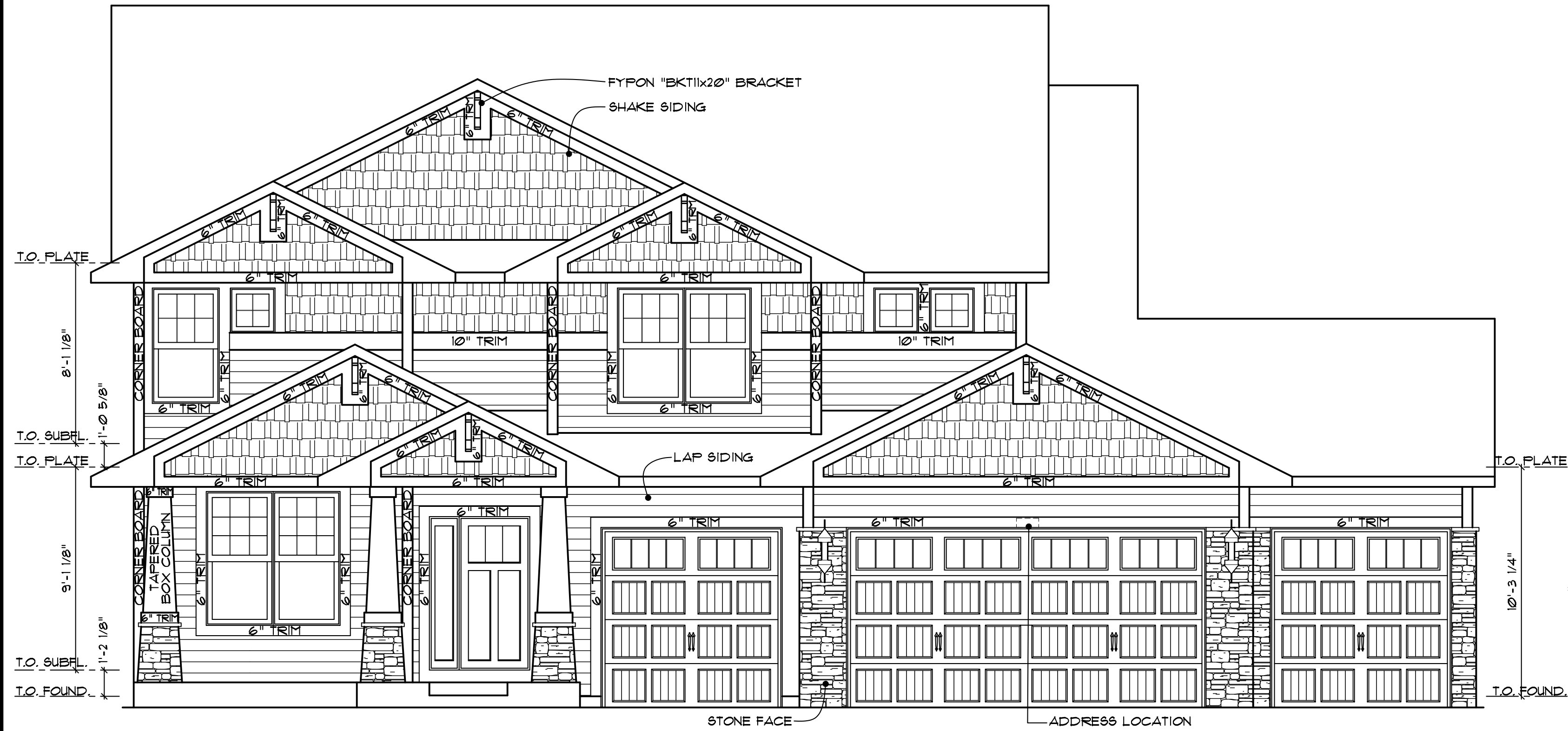
REPLACE 1/2" BUILT-RITE SHEATHING WITH 1/2" O.S.B.
SHEATHING BEHIND ALL VINYL AND LP BOARD & BATTEN
AND / OR SHAKE SIDING.

ALUMINUM FASCIA & SOFFIT ON ALL SIDES OF HOME,
INCLUDES PORCH CEILING

ALL TRIM MATERIALS SHOWN TO BE PER COMMUNITY
SPEC'S. TRIM SIZED PER PLAN.

PER PLAN AND COMMUNITY SPECIFICATIONS ONLY:
WRAP ALL WINDOWS AT SIDES & REAR OF HOME W/ TRIM

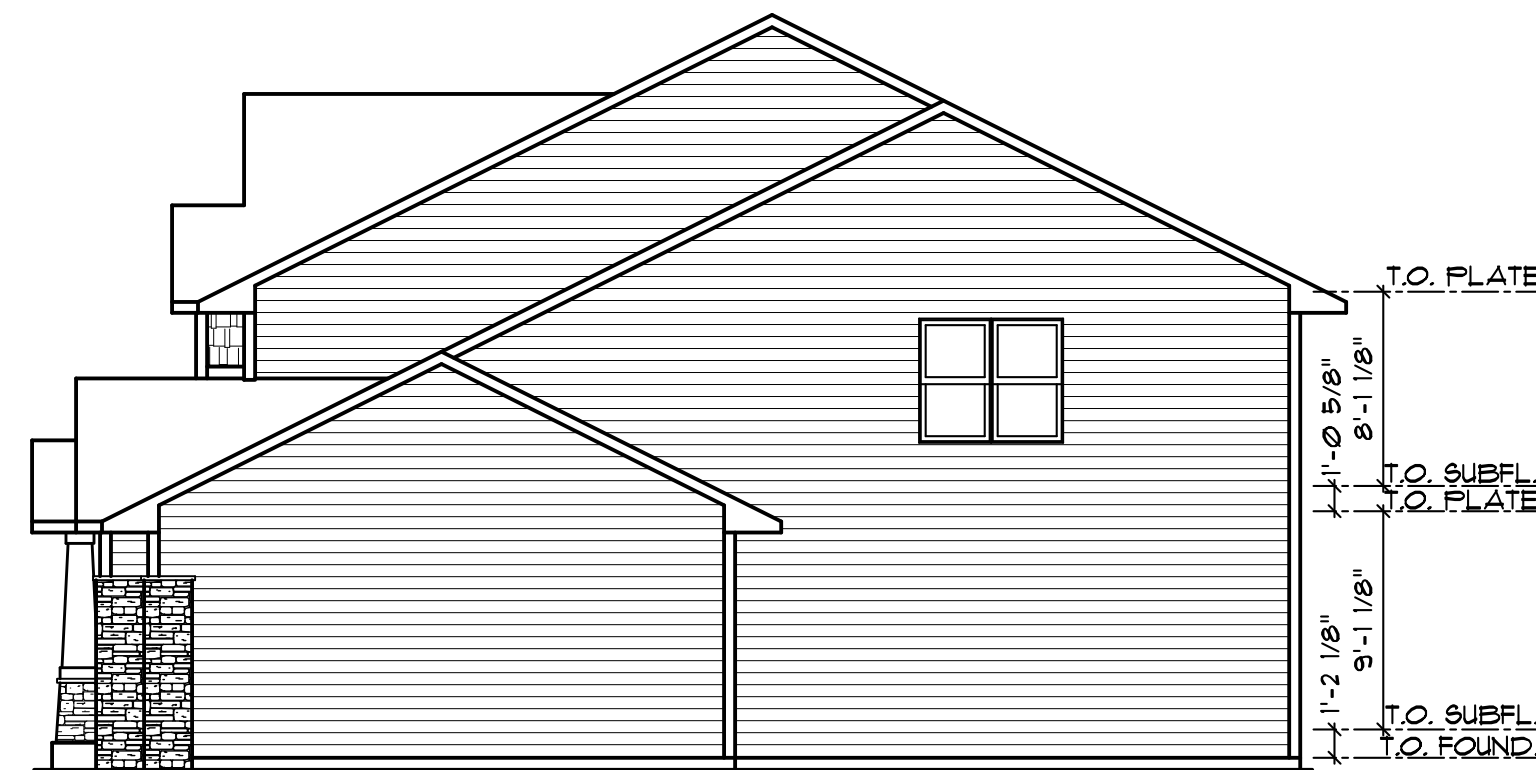
INSTALL HOUSE WRAP AROUND ENTIRE HOME, SEE DETAIL
6/A5 FOR INSTRUCTIONS ON WRAPPING THE WINDOWS



1 FRONT ELEVATION
SCALE: 1/4" = 1'-0"



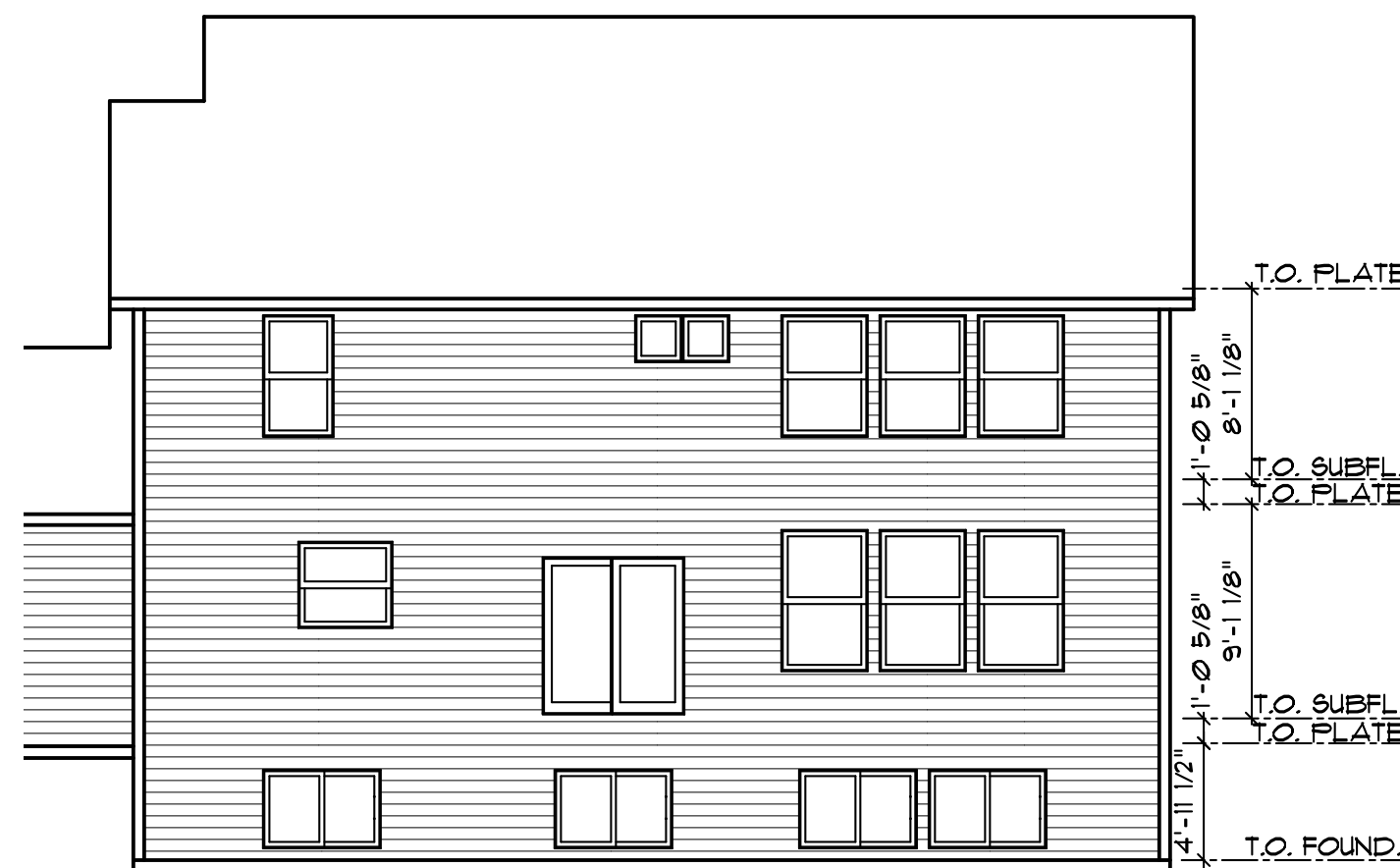
3 SIDE ELEVATION
SCALE: 1/8" = 1'-0"



4 SIDE ELEVATION
SCALE: 1/8" = 1'-0"



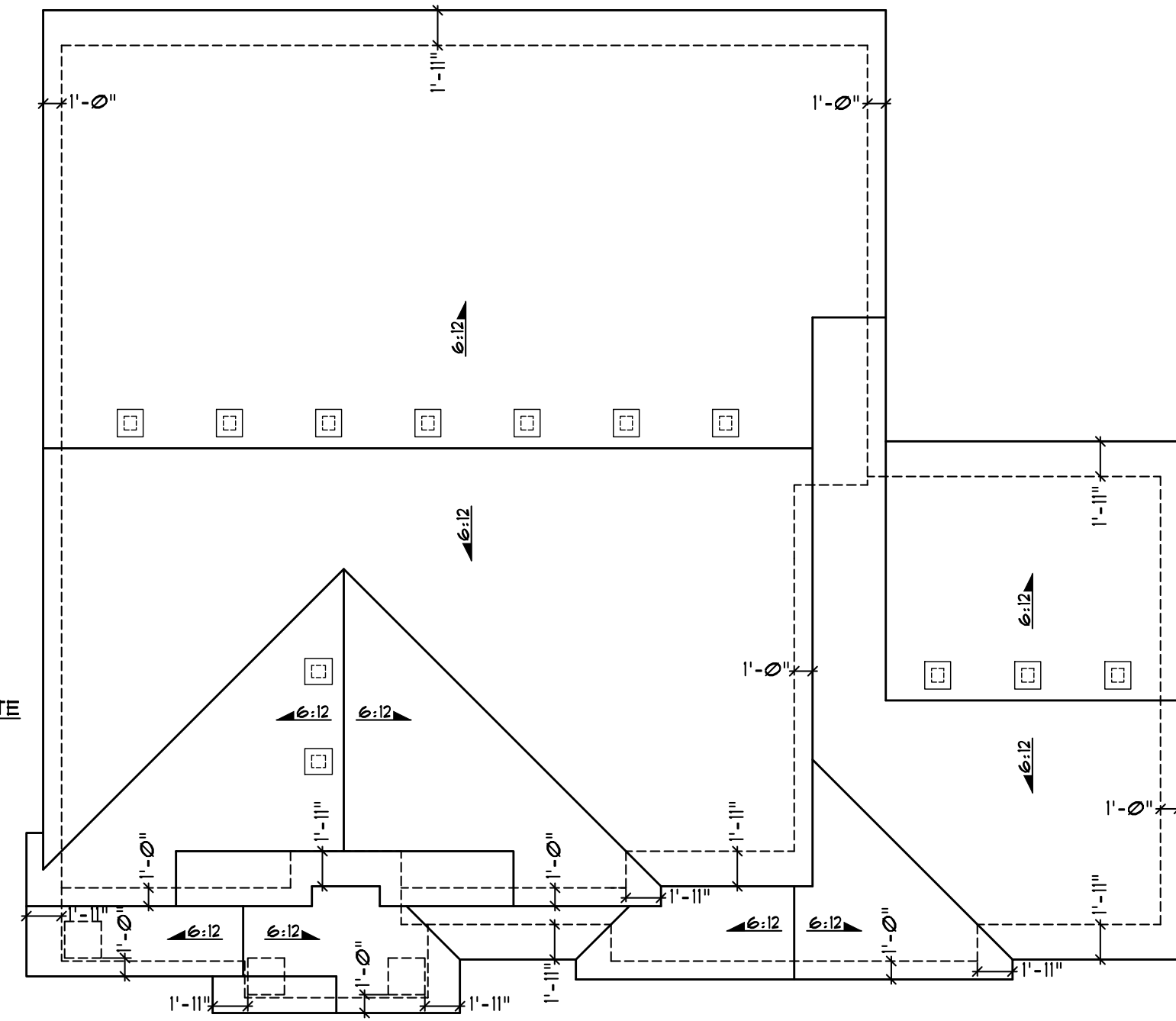
5 REAR ELEVATION
SCALE: 1/8" = 1'-0"



5A LOOKOUT ELEVATION
SCALE: 1/8" = 1'-0"



5B WALKOUT ELEVATION
SCALE: 1/8" = 1'-0"



2 ROOF PLAN
SCALE: 1/8" = 1'-0"

- ROOF VENT INSTALLATION NOTES:
1. ALL ROOF VENTS TO BE INSTALLED OVER 8" WIDE x 9" HIGH OPENINGS INTO THE ROOF SHEATHING.
 2. STANDARD LOCATION OF ROOF VENTS ON GABLE ROOFS TO BE 12" DOWN FROM THE ROOF RIDGE TO THE TOP OF THE 8"x9" OPENING.
 3. HIP ROOFS MAY REQUIRE THE OPENINGS TO BE CUT FURTHER DOWN FROM ROOF RIDGE TO ALIGN W/ REQUIRED SIDE ROOF VENTS. SEE ROOF PLAN.
 4. ROOF SHEATHING TO BE REMOVED FROM UNDERNEATH OVERFRAMED OR PERPENDICULAR ROOF SYSTEMS FOR PROPER AIR MOVEMENT.
 5. NO ROOF VENT OPENINGS WITHIN 36" OF ANY VALLEYS.

DATE: SEPTEMBER 2019
DRAWN BY:
REVISD: 05-01-2021
REVISD:

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LENNAR

OWNER: EH05 C4 - WASHBURN

PROJECT ADDRESS:
DEVELOPMENT:

LOT NO.
BLOCK NO.
ADDITION NO.

PN:
TITLE: ELEV
SHEET: A1

CLAIMS ROSTER REPORT

FOR COUNCIL MEETING:

October 18, 2021

Paid and Unpaid Invoices:

Check #'s 339803-339991

\$2,668,979.54

Paid Electronic Invoices:

Wire #'s 2954-2963

\$490,918.04

Amount for Approval-Council Meeting:

October 18, 2021

\$3,159,897.58

Checks

10/14/2021 13:27 8482mrob		City of Chaska VENDOR INVOICE LIST		P apinvlst		1		munis a tyler erp solution	
INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
110147 30 30 CONCRETE INC									
107122 CHECK DATE: 10/19/2021		10/01/2021	101921	339831	2,800.00	11/01/2021	INV	PD	CURB REPLACEMENT ON RIDGE
100006 SCOTT A HUTNICK									
93964 CHECK DATE: 10/05/2021		09/30/2021	100521-2	339803	450.00	10/15/2021	INV	PD	Animal Control-Sep
109705 AHMED MOHAMED ABSHIR									
94218 CHECK DATE: 10/19/2021		10/11/2021	101921	339832	174.50	11/11/2021	INV	PD	TRANSLATE & INTERPRET ENG
103825 ACUSHNET COMPANY									
911893374 CHECK DATE: 10/19/2021		09/27/2021	101921	339833	646.80	10/27/2021	INV	PD	RESALE
911939103 CHECK DATE: 10/19/2021		10/04/2021	101921	339833	97.92	11/03/2021	INV	PD	RESALE
					744.72				
100073 AMARIL UNIFORM CO									
IV218563 CHECK DATE: 10/19/2021		10/05/2021	101921	339834	1,039.51	11/05/2021	INV	PD	M. ENGELEN RAIN SUIT - CI
110018 ANDERSON ORD LLC									
2646 CHECK DATE: 10/19/2021		10/06/2021	101921	339835	32.00	11/06/2021	INV	PD	RESALE EMBROIDERY
100119 SHAKOPEE VALLEY FORD									
305323FOW CHECK DATE: 10/19/2021		09/27/2021	101921	339836	45.84	10/27/2021	INV	PD	Squad 1191 Parts
305328FOW CHECK DATE: 10/19/2021		09/27/2021	101921	339836	18.55	10/27/2021	INV	PD	Squad 1191 Spark Plugs
					64.39				
100146 ASPEN MILLS INC									
281272 CHECK DATE: 10/19/2021		09/29/2021	101921	339837	69.40	10/29/2021	INV	PD	DUTY PANTS-ROSENOW



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
104425 BAKKELUND TREE AND LANDSCAPE SERVICE LLC									
3376		09/27/2021	101921	339838	3,850.00	10/27/2021	INV	PD	REMOVAL OF A HAZARD TREE-
CHECK DATE:	10/19/2021								
3388		10/05/2021	101921	339838	5,450.00	11/04/2021	INV	PD	HAZARD TREE REMOVAL EAST
CHECK DATE:	10/19/2021								
					9,300.00				
100174 BAUER BUILT TIRE AND BATTERY									
180274556		09/24/2021	101921	339839	367.80	10/24/2021	INV	PD	PARK MOWER TIRES
CHECK DATE:	10/19/2021								
100201 BCBSM INC									
211001155717		10/01/2021	101421	339819	170,992.15	10/20/2021	INV	PD	NOV EMP INS PREM-MEDICAL
CHECK DATE:	10/14/2021								
110112 BOENICK, DAVID									
10004835		09/29/2021	101921	339840	88.13	10/29/2021	INV	PD	CREDIT BALANCE REFUND-173
CHECK DATE:	10/19/2021								
102279 BOLTON & MENK INC									
0275767		09/17/2021	101921	339841	8,918.50	10/21/2021	INV	PD	CULTURAL RESOURCES MONITO
CHECK DATE:	10/19/2021								
0275768		09/17/2021	101921	339841	3,501.00	10/21/2021	INV	PD	SEWER EXT FUNDING SUPPORT
CHECK DATE:	10/19/2021								
0276015		09/17/2021	101921	339841	400,820.31	10/21/2021	INV	PD	TH 41 & CSAH 61 IMPROVEME
CHECK DATE:	10/19/2021								
					413,239.81				
100214 BORDER STATES INDUSTRIES INC									
922891273	210131	09/24/2021	101921	339842	662.50	10/25/2021	INV	PD	CONNECT TRANS 4 COV'D, SP
CHECK DATE:	10/19/2021								
922902030	210131	09/27/2021	101921	339842	342.28	10/25/2021	INV	PD	CONNECT TRANS 4 COV'D, SP
CHECK DATE:	10/19/2021								
922968624	210136	10/06/2021	101921	339842	614.18	11/25/2021	INV	PD	100 = PHOTO EYE 1000W 105
CHECK DATE:	10/19/2021								



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
100225 BRADY, EMERSON					1,618.96				
94199 CHECK DATE: 10/19/2021		09/17/2021	101921	339843	140.73	11/11/2021	INV	PD	MILEAGE-MMUA OVERHEAD SCH
100226 BRAUN INTERTEC CORPORATION									
B269273 CHECK DATE: 10/19/2021		10/06/2021	101921	339844	100.50	11/06/2021	INV	PD	LAKE GRACE TRAIL BRIDGE
100256 BUILDING MATERIAL SUPPLY INC									
54925 CHECK DATE: 10/19/2021		09/22/2021	101921	339845	1,897.00	10/22/2021	INV	PD	Privacy Shower Screens (Me
102474 STATE OF MINNESOTA; DEPARTMENT OF PUBLIC SAFETY									
00000673917 CHECK DATE: 10/19/2021		09/30/2021	101921	339846	270.00	10/30/2021	INV	PD	Data processing
100299 CARVER COUNTY PARKS & RECREATION									
203312 CHECK DATE: 10/19/2021		09/24/2021	101921	339847	2,238.75	10/24/2021	INV	PD	Carver County Parks progr
107854 CASTLE, ANDREW									
94072 CHECK DATE: 10/19/2021		09/20/2021	101921	339848	241.92	11/05/2021	INV	PD	MILEAGE 4/29-9/20
100323 CDW GOVERNMENT INC									
L019350 CHECK DATE: 10/19/2021		09/21/2021	101921	339849	3,221.00	10/21/2021	INV	PD	PRTG SERVICE RENEWAL
L031093 CHECK DATE: 10/19/2021		09/21/2021	101921	339849	69.17	10/21/2021	INV	PD	IT CISCO WALL MOUNT PHONE
100337 QWEST CORPORATION					3,290.17				
313692512/OCT21 CHECK DATE: 10/14/2021		10/01/2021	101421	339820	258.35	10/29/2021	INV	PD	OCT TC CLUBHS LOC PHN SVC
313773369/OCT21 CHECK DATE: 10/14/2021		10/01/2021	101421	339820	99.11	10/29/2021	INV	PD	OCT CCC BURGLAR ALARM



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
					357.46				
100338 QWEST CORPORATION									
202001327/SEP21 CHECK DATE: 10/05/2021		09/21/2021	100521-2	339804	40.95	10/18/2021	INV	PD	SEP T1 FOR PHONE SYSTEM
100379 CITY OF CHANHASSEN									
94187 CHECK DATE: 10/19/2021		09/24/2021	101921	339850	1,384.00	11/04/2021	INV	PD	Hudson River Cruise Expen
107927 CHASKA AREA COMPETITIVE JR CURLING CLUB									
10132021 CHECK DATE: 10/19/2021		10/13/2021	101921	339851	330.00	11/13/2021	INV	PD	Remit mbr donations-SubZe
110117 CHASKA GRAND SLAM CLUB									
2004165.002 CHECK DATE: 10/14/2021		05/30/2018	101421	339821	350.00	11/04/2021	INV	PD	REFUND DEPOSIT PAID BY CO
100368 CHASKA LAUNDRY CENTER									
2212 CHECK DATE: 10/14/2021		09/30/2021	101421	339822	163.25	10/20/2021	INV	PD	SEP TOWELS-TC
100377 CHASKA ROTARY CLUB									
5530 CHECK DATE: 10/19/2021		10/01/2021	101921	339852	300.00	10/31/2021	INV	PD	4TH QTR DUES, MEALS-PODHR
100350 CHASKA, CITY OF									
F&I 2021 BEAN BAG CHECK DATE: 10/14/2021		10/07/2021	101421	339823	300.00	10/14/2021	INV	PD	FIRE & ICE BEAN BAG TOURN
109942 MANSFIELD TOP SERVICES INC									
32009004362 CHECK DATE: 10/19/2021		10/01/2021	101921	339853	2,160.00	10/31/2021	INV	PD	Oct Curl/Event Cleaning
42009001685 CHECK DATE: 10/19/2021		09/27/2021	101921	339853	790.64	10/27/2021	INV	PD	Sep Event Ctr extra clean



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
102038 ULTIMATE SAFETY CONCEPTS INC					2,950.64				
196443		10/01/2021	101921	339854	740.00	11/01/2021	INV	PD	GEAR, NECK STRAPS FOR SCB
CHECK DATE: 10/19/2021									
100418 CLEARSOFT INC									
144-319		10/01/2021	101921	339855	75.00	10/27/2021	INV	PD	OCT FD WATER SOFTENER REN
CHECK DATE: 10/19/2021									
100419 CLOVER CONDOMINIUM ASSOCIATION									
00498838-6	210064	10/14/2021	101421	339824	365.17	11/01/2021	INV	PD	NOV COMMUNITY ROOM DUES
CHECK DATE: 10/14/2021									
109691 PRO-SHOPKEEPER COMPUTER SOFTWARE COMPANY									
346425		10/05/2021	101921	339856	625.00	11/05/2021	INV	PD	OCT TC SOFTWARE
CHECK DATE: 10/19/2021									
100428 COBRA GOLF INC									
G2690626		10/01/2021	101921	339857	87.72	11/30/2021	INV	PD	RESALE
CHECK DATE: 10/19/2021									
G2691416		10/02/2021	101921	339857	87.72	12/01/2021	INV	PD	RESALE
CHECK DATE: 10/19/2021									
					175.44				
102867 TILLER CORPORATION									
210930		09/30/2021	101921	339858	43,935.89	10/13/2021	INV	PD	COMMUNITY PARK TRAIL OVER
CHECK DATE: 10/19/2021									
109773 COMMUNITY DESIGN GROUP INC									
FJ-007		10/08/2021	101921	339859	1,738.80	11/08/2021	INV	PD	Ped/Bike Plan-Sep
CHECK DATE: 10/19/2021									
107686 CONCENTRA HEALTH SERVICES INC									
15144339		09/21/2021	101921	339860	184.00	10/21/2021	INV	PD	DOT ANNUAL QUERIES
CHECK DATE: 10/19/2021									
100450 COOL AIR MECHANICAL									



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
22675 CHECK DATE: 10/19/2021		09/24/2021	101921	339861	1,341.79	10/24/2021	INV	PD	Svc Dehumidification Unit
109687 DEANS PROFESSIONAL									
P21-311 CHECK DATE: 10/19/2021		09/30/2021	101921	339862	60.00	10/30/2021	INV	PD	RFD PLUMBING PERMIT-CANCE PAYEE: DEANS HOME SERVICES
110110 DELGADO, STEPHANIE									
10003104 CHECK DATE: 10/19/2021		09/29/2021	101921	339863	3.55	10/29/2021	INV	PD	CREDIT BALANCE REFUND-316
100541 DLT SOLUTIONS LLC									
SI538460 CHECK DATE: 10/19/2021	210130	10/07/2021	101921	339864	678.15	10/20/2021	INV	PD	AUTOCAD SUBSCRIPTION RENE
110109 DODOO, SAMUEL NII									
32451 CHECK DATE: 10/19/2021		09/29/2021	101921	339865	533.44	10/29/2021	INV	PD	CREDIT BALANCE REFUND-253
107079 DONS SOD SERVICE LLC									
93969 CHECK DATE: 10/19/2021		09/18/2021	101921	339866	900.00	10/18/2021	INV	PD	SOD FOR BASEBALL TOURNAME
105629 DICKS SANITATION SERVICE INC									
DT0004120473 CHECK DATE: 10/19/2021		07/31/2021	101921	339867	1,846.18	10/12/2021	INV	PD	RIVER CITY DAYS
DT0004225809 CHECK DATE: 10/19/2021		09/30/2021	101921	339867	805.70	10/30/2021	INV	PD	MSB
DT0004225810 CHECK DATE: 10/19/2021		09/30/2021	101921	339867	178.32	10/30/2021	INV	PD	FIRE STATION
DT0004225812 CHECK DATE: 10/19/2021		09/30/2021	101921	339867	213.42	10/30/2021	INV	PD	ATHLETIC PARK
DT0004225813 CHECK DATE: 10/19/2021		09/30/2021	101921	339867	147.42	10/30/2021	INV	PD	LION'S PARK
DT0004225814 CHECK DATE: 10/19/2021		09/30/2021	101921	339867	210.46	10/30/2021	INV	PD	VETERAN'S PARK



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
DT0004225815 CHECK DATE: 10/19/2021		09/30/2021	101921	339867	147.42	10/30/2021	INV	PD	COMMUNITY PARK
DT0004225816 CHECK DATE: 10/19/2021		09/30/2021	101921	339867	133.38	10/30/2021	INV	PD	MCKNIGHT PARK
DT0004225817 CHECK DATE: 10/19/2021		09/30/2021	101921	339867	133.38	10/30/2021	INV	PD	SUNSET PARK
					3,815.68				
100570 DYNAMIC BRANDS LLC									
INV1489432 CHECK DATE: 10/19/2021		09/24/2021	101921	339868	216.00	10/24/2021	INV	PD	SAND BOTTLES
100577 EASY PICKER GOLF PRODUCTS INC									
0167641-IN CHECK DATE: 10/19/2021		10/05/2021	101921	339869	113.02	11/05/2021	INV	PD	CONVERSION SPIGOTS-TC
100602 EMERGENCY APPARATUS MAINTENANCE INC									
120265 CHECK DATE: 10/19/2021		09/27/2021	101921	339870	5,563.61	10/27/2021	INV	PD	#328 FIRE TRUCK REPAIR
102657 ENERGY MANAGEMENT SOLUTIONS INC									
10294 CHECK DATE: 10/19/2021		10/01/2021	101921	339871	7,148.29	11/05/2021	INV	PD	OCT 2021 RETAINER FEE
105728 FIDELITY SECURITY LIFE INSURANCE COMPANY									
164976290 CHECK DATE: 10/05/2021		09/22/2021	100521-2	339805	713.11	10/22/2021	INV	PD	OCT EMP INS PREM-VISION
100649 FEDERAL EXPRESS CORPORATION									
7-516-15197 CHECK DATE: 10/05/2021		09/29/2021	100521-2	339806	66.65	10/14/2021	INV	PD	SHIPPING
100653 FERGUSON ENTERPRISES INC									
8729792-1 CHECK DATE: 10/19/2021		09/24/2021	101921	339872	181.27	10/24/2021	INV	PD	TOILET FLUSHING VALVE
8780090 CHECK DATE: 10/19/2021		09/28/2021	101921	339872	240.00	10/28/2021	INV	PD	TOILET TANK CH BASEMENT



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
8785833		09/30/2021	101921	339872	130.13	10/29/2021	INV	PD	TOILET PARTS CH BASEMENT
CHECK DATE: 10/19/2021									
100655 FERRELLGAS 7780961					551.40				
1117013648		10/06/2021	101921	339873	230.85	11/06/2021	INV	PD	PROPANE
CHECK DATE: 10/19/2021									
100693 FS3 INC									
74789	210134	10/04/2021	101921	339874	9,680.00	11/03/2021	INV	PD	{8000} CONDUIT 2" CONTINO
CHECK DATE: 10/19/2021									
100698 GALLS LLC									
019238083		09/08/2021	101921	339875	190.70	10/08/2021	INV	PD	Pesheck-Initial Issue Cla
CHECK DATE: 10/19/2021									
108000 GEORGE PHILLIPS CURLING STONE									
574759		09/09/2021	101921	339876	618.50	11/11/2021	INV	PD	Blade Sharpening
CHECK DATE: 10/19/2021									
100729 GILBERT MECHANICAL CONTRACTORS INC									
209740		10/13/2021	101921	339877	714.00	11/13/2021	INV	PD	QTRLY HVAC SVC
CHECK DATE: 10/19/2021									
100737 GMH ASPHALT CORPORATION									
52492200-2		09/30/2021	101921	339878	600,443.83	10/30/2021	INV	PD	2021 DT RECONSTRUCTION
CHECK DATE: 10/19/2021									
106901 INFLECTION.COM INC									
CIT02939039		09/30/2021	101921	339879	287.00	10/30/2021	INV	PD	SEP BACKGROUND CHECKS
CHECK DATE: 10/19/2021									
101463 GOPHER STATE ONE CALL									
1090281		09/30/2021	101921	339880	652.05	10/30/2021	INV	PD	SEPTEMBER LOCATES
CHECK DATE: 10/19/2021									
100753 GPS INDUSTRIES LLC									



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
REP0009597 CHECK DATE: 10/19/2021		09/30/2021	101921	339881	215.00	10/30/2021	INV	PD	REPAIR GPS UNIT
100759 GRAINGER									
9069961143 CHECK DATE: 10/19/2021		09/29/2021	101921	339882	60.23	10/29/2021	INV	PD	BELTS
100758 GRAYBAR ELECTRIC COMPANY INC									
9323531990 CHECK DATE: 10/19/2021		09/24/2021	101921	339883	459.03	10/24/2021	INV	PD	RING LOCKS
9323661619 CHECK DATE: 10/19/2021		10/01/2021	101921	339883	390.00	11/01/2021	INV	PD	MISC LINE HARDWARE - N/S
9323770926 CHECK DATE: 10/19/2021	210138	10/08/2021	101921	339883	685.31	11/08/2021	INV	PD	CONNECT GEL #4-#2, FUSE L
					1,534.34				
100785 HACH COMPANY									
12662233 CHECK DATE: 10/19/2021		09/29/2021	101921	339884	957.72	10/29/2021	INV	PD	WTP CHEMICAL TESTING SUPP
12664500 CHECK DATE: 10/19/2021		09/30/2021	101921	339884	155.75	10/30/2021	INV	PD	WTP CHLORINE
					1,113.47				
100810 HAWKINS INC									
6028724 CHECK DATE: 10/19/2021		09/24/2021	101921	339885	10.00	11/08/2021	INV	PD	DEMURRAGE
6028898 CHECK DATE: 10/19/2021		09/24/2021	101921	339885	5.00	11/08/2021	INV	PD	DEMURRAGE
6031425 CHECK DATE: 10/19/2021		09/27/2021	101921	339885	4,706.24	11/11/2021	INV	PD	WTP CHEMICALS
					4,721.24				
100830 HELSTROM, DEREK									
94071 CHECK DATE: 10/19/2021		09/18/2021	101921	339886	292.32	11/05/2021	INV	PD	MILEAGE 5/2-9/18
100848 HIGH TECH CLEANING INC									
17057		09/20/2021	101921	339887	6,461.95	10/20/2021	INV	PD	Aug CCC Cleaning-Bathroom



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
CHECK DATE: 10/19/2021									
17060		09/28/2021	101921	339887	1,638.84	10/28/2021	INV	PD	PARK DEPT CLEANING SUPPLI
CHECK DATE: 10/19/2021									
17069		09/28/2021	101921	339887	900.12	10/28/2021	INV	PD	FD CLEANING SUPPLIES
CHECK DATE: 10/19/2021									
17081		10/01/2021	101921	339887	3,092.25	11/01/2021	INV	PD	CITY HALL
CHECK DATE: 10/19/2021									
17082		10/01/2021	101921	339887	485.16	11/01/2021	INV	PD	COMMUNITY ROOM - CLOVER R
CHECK DATE: 10/19/2021									
17084		10/01/2021	101921	339887	1,140.83	11/01/2021	INV	PD	HISTORY CENTER
CHECK DATE: 10/19/2021									
17085		10/01/2021	101921	339887	202.15	11/01/2021	INV	PD	IT DEPARTMENT
CHECK DATE: 10/19/2021									
17086		10/01/2021	101921	339887	1,971.55	11/01/2021	INV	PD	MSB
CHECK DATE: 10/19/2021									
17087		10/01/2021	101921	339887	161.72	11/01/2021	INV	PD	STANTEC BUILDING
CHECK DATE: 10/19/2021									
17088		10/01/2021	101921	339887	625.00	11/01/2021	INV	PD	WTP
CHECK DATE: 10/19/2021									
					16,679.57				
110115 HIRASAWA, ROBERT									
32648		09/29/2021	101921	339888	170.59	10/29/2021	INV	PD	CREDIT BALANCE REFUND-114
CHECK DATE: 10/19/2021									
100878 HUEBSCH									
84176/SEP2021		09/30/2021	101921	339889	1,716.74	10/30/2021	INV	PD	SEP RUG/MAT SVC
CHECK DATE: 10/19/2021									
100879 PRAIRIE TECHNOLOGIES INC OF MN									
210406		08/31/2021	101921	339890	7,647.00	11/01/2021	INV	PD	New Air Quality Sensors f
CHECK DATE: 10/19/2021									
108162 HYDRO-DESIGNS INC									
0063742-IN		09/30/2021	101921	339891	680.96	10/30/2021	INV	PD	RPZ TESTING MGT SEPT 2021
CHECK DATE: 10/19/2021									



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
100889	INTERNATIONAL CITY	MGMT ASSN RETIREMENT	CORP						
2021/1008-ICMA		10/08/2021	101421	339825	8,912.26	10/08/2021	INV	PD	100821 Payroll 457 & Roth
CHECK DATE:	10/14/2021								
104751	IMPACT MAILING OF MINNESOTA INC								
154937		09/30/2021	101921	339892	9,703.51	10/31/2021	INV	PD	Sep Bills
CHECK DATE:	10/19/2021								
100901	INDEPENDENT SCHOOL DISTRICT 112								
9002200017-1		10/06/2021	101921	339893	1,581.30	11/06/2021	INV	PD	ATHLETIC FIELD MARKING PA
CHECK DATE:	10/19/2021								
108039	INDIGO SIGNWORKS INC								
69923		09/29/2021	101921	339894	190.77	10/29/2021	INV	PD	SIGNAGE-TC
CHECK DATE:	10/19/2021								
100917	INTERSTATE POWER SYSTEMS INC								
C001177876:01		09/27/2021	101921	339895	215.57	10/27/2021	INV	PD	TRANSMISSION FILTERS FOR
CHECK DATE:	10/19/2021								
100943	JEFFERSON FIRE & SAFETY INC								
IN133536		09/29/2021	101921	339896	8,239.44	10/29/2021	INV	PD	FF GEAR FOR NEW FF
CHECK DATE:	10/19/2021								
100992	KEYS WELL DRILLING COMPANY								
2021084		09/27/2021	101921	339897	35,020.00	10/27/2021	INV	PD	MATERIALS FOR TC WELL REP
CHECK DATE:	10/19/2021								
110113	KOEL, JON								
10011258		09/29/2021	101921	339898	236.69	10/29/2021	INV	PD	CREDIT BALANCE REFUND-110
CHECK DATE:	10/19/2021								
101018	KRISS PREMIUM PRODUCTS INC								
174024		10/04/2021	101921	339899	707.00	11/04/2021	INV	PD	Condensing Tower Chemical
CHECK DATE:	10/19/2021								
101043	LANO EQUIPMENT INC								



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
01-864715 CHECK DATE: 10/19/2021		09/29/2021	101921	339900	75.99	10/29/2021	INV	PD	CHAIN SAW PARTS
01-865851 CHECK DATE: 10/19/2021		10/04/2021	101921	339900	295.19	11/04/2021	INV	PD	WEED WHIP PARTS
					371.18				
101050 LAW ENFORCEMENT LABOR SERVICES INC October 2021 CHECK DATE: 10/12/2021		10/08/2021	101221	339814	1,524.00	10/08/2021	INV	PD	October 2021 Police Union
101071 LENZEN CHEVROLET BUICK INC 83833 CHECK DATE: 10/19/2021		10/05/2021	101921	339901	17.56	11/05/2021	INV	PD	#2708 ELECTRIC DIP STICK
107698 LTR INTERMEDIATE HOLDINGS INC 2130514 CHECK DATE: 10/19/2021		09/25/2021	101921	339902	470.00	10/25/2021	INV	PD	TIRE RECYCLING
101093 LITTLE FALLS MACHINE INC 361849 CHECK DATE: 10/19/2021		09/29/2021	101921	339903	226.84	10/29/2021	INV	PD	#114 SNOW BELLY BLADE PAR
110118 LOCKRIDGE GRINDAL NAUEN PLLP 111512 CHECK DATE: 10/19/2021		09/01/2021	101921	339904	3,333.33	10/27/2021	INV	PD	CITY SQUARE WEST PROJECT
103842 LOCAL GOVERNMENT INFORMATION SYSTEMS 51000 CHECK DATE: 10/19/2021		10/01/2021	101921	339905	775.00	10/31/2021	INV	PD	OCT SA SUPPORT
101124 MACQUEEN EQUIPMENT P37354 CHECK DATE: 10/19/2021		09/20/2021	101921	339906	814.90	10/20/2021	INV	PD	#142 ELGIN SWEEPER PARTS
P37364 CHECK DATE: 10/19/2021		09/20/2021	101921	339906	68.86	10/20/2021	INV	PD	#142 ELGIN SWEEPER PARTS
P37425 CHECK DATE: 10/19/2021		09/23/2021	101921	339906	29.25	10/23/2021	INV	PD	#142 SWEEPER RADIATOR MOU



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
W09045		09/20/2021	101921	339906	1,873.51	10/20/2021	INV	PD	SEWER CAMERA WIRE RE-TERM
CHECK DATE: 10/19/2021									
					2,786.52				
103449 MADDEN GALANTER HANSEN LLP									
94069		10/05/2021	101921	339907	1,365.45	11/05/2021	INV	PD	AUG LEGAL
CHECK DATE: 10/19/2021									
110107 CARRIE CORLEE GOETTlicher									
0101621-1		09/22/2021	101921	339908	955.00	10/28/2021	INV	PD	Fire & Ice face painting
CHECK DATE: 10/19/2021									
104521 MANGOLD GROUP LLC									
2347		09/30/2021	101921	339909	2,040.00	10/30/2021	INV	PD	SEP MT PLEASANT MAINTENAN
CHECK DATE: 10/19/2021									
106393 MATT HENNING									
1809		10/01/2021	101921	339910	955.00	11/01/2021	INV	PD	Annual Fire Extinguisher
CHECK DATE: 10/19/2021									
106661 MAYER LUMBER COMPANY INC									
207358		10/11/2021	101921	339911	396.80	11/11/2021	INV	PD	SKATE PARK REPAIRS/FIREMA
CHECK DATE: 10/19/2021									
108565 MCGRANN SHEA CARNIVAL STRAUGHN AND LAMB CHARTERED									
138313		10/07/2021	101921	339912	37.00	11/07/2021	INV	PD	ELEC SERVICE TERRITORY-SE
CHECK DATE: 10/19/2021									
101176 METRO ALARM CONTRACTORS INC									
76538		09/29/2021	101921	339913	260.00	10/29/2021	INV	PD	CHLORINE DOOR REPAIR
CHECK DATE: 10/19/2021									
101183 METROPOLITAN COUNCIL									
SEP 2021 SAC		09/30/2021	101921	339914	135,308.25	10/30/2021	INV	PD	SEP SAC CHARGES
CHECK DATE: 10/19/2021									
101182 METROPOLITAN COUNCIL									



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
0001130535 CHECK DATE: 10/19/2021		10/05/2021	101921	339915	226,109.79	11/01/2021	INV	PD	NOV SEWER SERVICES FOR ME
101187 METRO SALES INC									
INV1895275 CHECK DATE: 10/19/2021		09/24/2021	101921	339916	122.00	10/24/2021	INV	PD	OCT FD COPIER
INV1903375 CHECK DATE: 10/19/2021		10/05/2021	101921	339916	197.00	11/04/2021	INV	PD	Contract invoice-PD
					319.00				
102688 MINNESOTA STATE COLLEGES AND UNIVERSITIES									
48968 CHECK DATE: 10/19/2021		09/30/2021	101921	339918	222.00	10/30/2021	INV	PD	4 HR Driver Safety Chaska
629430-8866 CHECK DATE: 10/19/2021		09/30/2021	101921	339917	400.00	10/30/2021	INV	PD	FF TRAINING 9/22
629430-8867 CHECK DATE: 10/19/2021		09/30/2021	101921	339917	2,200.00	10/30/2021	INV	PD	FF TRAINING 9/25
					2,822.00				
105424 MID AMERICA FESTIVALS									
94200 CHECK DATE: 10/19/2021		10/11/2021	101921	339919	71.90	10/22/2021	INV	PD	2021 MN RENAISSANCE FESTI
101196 MID COUNTY COOP #122622									
53066 CHECK DATE: 10/19/2021		10/06/2021	101921	339920	582.63	11/06/2021	INV	PD	182 GLS GAS-TC
53067 CHECK DATE: 10/19/2021		10/06/2021	101921	339920	761.59	11/06/2021	INV	PD	240 GLS DIESEL-TC
					1,344.22				
101217 MINNESOTA CHILD SUPPORT PMT CTR									
PR100821001510208001 CHECK DATE: 10/12/2021		10/08/2021	101221	339815	184.58	10/08/2021	INV	PD	100821 Payroll Child Supp
110099 MINNESOTA CORN									
2011318.002 REISSUE CHECK DATE: 10/19/2021		09/14/2021	101921	339921	450.00	11/07/2021	INV	PD	RFD DEPOSIT FOR CURLING E



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
101227 MINNESOTA ELEVATOR INC									
931429		10/01/2021	101921	339922	422.16	11/01/2021	INV	PD	Oct CCC Elevator Service
CHECK DATE: 10/19/2021									
101236 MINNESOTA GOLF ASSOCIATION INC									
511642		09/30/2021	101921	339923	785.00	10/30/2021	INV	PD	HANDICAP DUES
CHECK DATE: 10/19/2021									
101247 MINNESOTA MUNICIPAL UTILITIES ASSN									
58036		10/05/2021	101921	339924	350.00	11/04/2021	INV	PD	G. WICKENHAUSER-2021 TREE
CHECK DATE: 10/19/2021									
58063		10/05/2021	101921	339924	1,350.00	11/04/2021	INV	PD	JOB TRAINING & SAFETY PRO
CHECK DATE: 10/19/2021									
					1,700.00				
101303 MN TEAMSTER PUBLIC AND LAW ENFORCEMENT									
October 2021		10/08/2021	101221	339816	4,576.00	10/08/2021	INV	PD	October 2021 Local #320 U
CHECK DATE: 10/12/2021									
101276 MINNESOTA VALLEY ELECTRIC COOPERATIVE									
107050711/SEP21		09/27/2021	100521-2	339807	796.40	10/22/2021	INV	PD	SEP ST LITES-TOWN COURSE
CHECK DATE: 10/05/2021									
121770311/SEP21		09/27/2021	100521-2	339807	24.85	10/22/2021	INV	PD	SEP 4255 CREEK RD
CHECK DATE: 10/05/2021									
778377500/SEP21		10/07/2021	101421	339826	48.23	11/02/2021	INV	PD	SEP 12500 CTY RD 11 SIGNA
CHECK DATE: 10/14/2021									
778377800/SEP21		10/07/2021	101421	339826	34.89	11/02/2021	INV	PD	SEP 4250 ENGLER BLVD SIGN
CHECK DATE: 10/14/2021									
781385500/SEP21		10/07/2021	101421	339826	10.45	11/02/2021	INV	PD	SEP 4463 CTY RD 44
CHECK DATE: 10/14/2021									
					914.82				
101341 MINNESOTA DEPT OF LABOR & INDUSTRY									
ALR0124185X		09/25/2021	101921	339925	100.00	10/25/2021	INV	PD	CITY HALL ELEVATOR ANNUAL
CHECK DATE: 10/19/2021									
ALR0125073X		09/25/2021	101921	339925	100.00	10/25/2021	INV	PD	LIBRARY ELEVATOR ANNUAL O
CHECK DATE: 10/19/2021									



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
SEPTEMBER0190352021 CHECK DATE: 10/19/2021		09/30/2021	101921	339926	7,095.94	10/30/2021	INV	PD	SEP PERMIT SURCHARGES
					7,295.94				
105853 MOR GOLF AND UTILITY INC									
28822 CHECK DATE: 10/19/2021		09/28/2021	101921	339927	45.81	10/28/2021	INV	PD	CART PARTS
29088 CHECK DATE: 10/19/2021		09/30/2021	101921	339927	800.00	10/30/2021	INV	PD	CART RENTALS
29108 CHECK DATE: 10/19/2021		10/07/2021	101921	339927	44.09	11/07/2021	INV	PD	CART PARTS
					889.90				
103236 MRA-THE MANAGEMENT ASSOCIATION									
00394485 CHECK DATE: 10/05/2021		09/08/2021	100521-2	339808	175.00	10/08/2021	INV	PD	AUG COMPENSATION SERVICES
101356 MTI DISTRIBUTING INC #31380									
1321283-00 CHECK DATE: 10/19/2021		09/14/2021	101921	339928	78.16	10/14/2021	INV	PD	SCREEN FILTER FOR IRRIGAT
1322623-01 CHECK DATE: 10/19/2021		09/20/2021	101921	339928	141.41	10/20/2021	INV	PD	#234 PARK MOWER PARTS
1323524-00 CHECK DATE: 10/19/2021		09/15/2021	101921	339928	344.38	10/15/2021	INV	PD	#243 AERATOR PARTS
1324367-00 CHECK DATE: 10/19/2021		09/22/2021	101921	339928	382.87	10/22/2021	INV	PD	PARK MOWER PARTS
1324367-01 CHECK DATE: 10/19/2021		09/23/2021	101921	339928	154.90	10/23/2021	INV	PD	#234 MOWER PARTS
1325138-00 CHECK DATE: 10/19/2021		09/28/2021	101921	339928	345.80	10/28/2021	INV	PD	#270 WORKMAN PARTS
1325238-00 CHECK DATE: 10/19/2021		09/30/2021	101921	339928	142.35	10/30/2021	INV	PD	#270 WORKMAN WHEEL BEARIN
					1,589.87				
101355 MTI DISTRIBUTING INC #400012									
1320667-02 CHECK DATE: 10/19/2021		10/01/2021	101921	339929	381.64	10/31/2021	INV	PD	PAR 30 IRRIGATION SUPPLIE



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
1326251-00		10/06/2021	101921	339929	228.04	11/06/2021	INV	PD	PAR 30 IRRIGATION SUPPLIE
CHECK DATE: 10/19/2021									
					609.68				
101357 MUELLER SYSTEMS LLC									
65314671	210132	09/28/2021	101921	339930	10,290.00	10/28/2021	INV	PD	(100) SMART METERS CL200
CHECK DATE: 10/19/2021									
110054 NAGEL COMPANIES LLC									
202199		10/05/2021	101921	339931	77,284.75	11/04/2021	INV	PD	WO#900 HIGHLAND ACRES OH
CHECK DATE: 10/19/2021									
101365 STAR GROUP LLC									
4472/SEP2021		09/30/2021	101221	339817	2,894.72	10/10/2021	INV	PD	SEP PARTS & SUPPLIES
CHECK DATE: 10/12/2021									
106198 NAVIANT INC									
0143528-IN		09/30/2021	101921	339932	3,043.65	10/20/2021	INV	PD	SEP ONBASE HOSTING FEE
CHECK DATE: 10/19/2021									
105875 NETWORKFLEET INC									
OSV000002575265		10/01/2021	101921	339933	259.04	11/01/2021	INV	PD	Data Processing - GPS
CHECK DATE: 10/19/2021									
101425 NORTHERN SAFETY TECHNOLOGY INC									
52918		09/28/2021	101921	339934	337.56	10/28/2021	INV	PD	#328 FIRE LED LIGHTS
CHECK DATE: 10/19/2021									
106302 OCEAN ENTERPRISES LLC									
I-W026-4		09/27/2021	101921	339935	1,410.00	10/27/2021	INV	PD	ELECTRONICS RECYCLING
CHECK DATE: 10/19/2021									
101445 OFFICE DEPOT									
200013877001		09/26/2021	101921	339937	-16.78	11/01/2021	CRM	PD	Credit-Seals for certific
CHECK DATE: 10/19/2021									
201900708001		09/28/2021	101921	339937	141.24	10/29/2021	INV	PD	Paper
CHECK DATE: 10/19/2021									



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
202498333001		10/04/2021	101921	339936	130.61	11/06/2021	INV	PD	Copy paper for the workro
CHECK DATE: 10/19/2021									
101465 ON SITE SANITATION INC					255.07				
0001214313		10/02/2021	101921	339938	172.00	11/02/2021	INV	PD	TOWN COURSE MAINTENANCE
CHECK DATE: 10/19/2021									
0001214314		10/02/2021	101921	339938	146.00	11/02/2021	INV	PD	SUNSET PARK
CHECK DATE: 10/19/2021									
0001214315		10/02/2021	101921	339938	146.00	11/01/2021	INV	PD	CLOVER RIDGE SOCCER FIELD
CHECK DATE: 10/19/2021									
0001214316		10/02/2021	101921	339938	146.00	11/01/2021	INV	PD	CITY SQUARE PARK
CHECK DATE: 10/19/2021									
0001214317		10/02/2021	101921	339938	172.00	11/02/2021	INV	PD	TOWN COURSE
CHECK DATE: 10/19/2021									
110114 OSCARSON, ERIC					782.00				
10014745		09/29/2021	101921	339939	95.93	10/29/2021	INV	PD	CREDIT BALANCE REFUND-110
CHECK DATE: 10/19/2021									
101491 PATCHIN MESSNER APPRAISALS INC									
22133A		09/28/2021	101921	339940	962.50	10/28/2021	INV	PD	2021 DT RECON - POLAR MN
CHECK DATE: 10/19/2021									
22167		10/04/2021	101921	339940	5,840.00	11/04/2021	INV	PD	APPRAISAL FOR SALE OF CIT
CHECK DATE: 10/19/2021									
101530 PING INC					6,802.50				
15982278		09/24/2021	101921	339941	446.60	11/24/2021	INV	PD	RESALE-CREDIT TO FOLLOW
CHECK DATE: 10/19/2021									
15992466		10/01/2021	101921	339941	361.11	12/01/2021	INV	PD	RESALE
CHECK DATE: 10/19/2021									
15997895		10/06/2021	101921	339941	-446.60	11/06/2021	CRM	PD	RESALE CREDIT
CHECK DATE: 10/19/2021									
101564 PRAIRIE RESTORATIONS INC					361.11				



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
31214		10/05/2021	101921	339942	225.00	11/04/2021	INV	PD	WTP 2021 VEGETATION MANAG
CHECK DATE: 10/19/2021									
101571 PREMIUM WATERS INC									
318385898		09/30/2021	101921	339944	61.85	10/31/2021	INV	PD	Water cooler-PD Qtrly
CHECK DATE: 10/19/2021									
417080-09-21		09/30/2021	101921	339943	38.27	10/31/2021	INV	PD	WATER TC CLUBHOUSE
CHECK DATE: 10/19/2021									
					100.12				
101576 KENNETH F FORNER									
20216009		09/23/2021	101921	339945	390.89	10/23/2021	INV	PD	Fire & Ice Banner
CHECK DATE: 10/19/2021									
101591 PUMP AND METER SERVICE INC									
514834		09/30/2021	101921	339946	1,583.00	10/30/2021	INV	PD	FUEL PUMP & FUEL TANKS TE
CHECK DATE: 10/19/2021									
103055 QUALITY PROPANE INC									
220180		09/13/2021	100721	339812	85.59	10/13/2021	INV	PD	LP Gas
CHECK DATE: 10/07/2021									
220696		09/27/2021	101921	339947	74.52	10/27/2021	INV	PD	LP Gas for Zamboni
CHECK DATE: 10/19/2021									
220960		10/11/2021	101921	339947	112.05	11/10/2021	INV	PD	LP Gas for Zamboni
CHECK DATE: 10/19/2021									
					272.16				
107855 STAPLES INC									
19944655-1		10/01/2021	101921	339948	161.79	10/31/2021	INV	PD	Misc office supplies for
CHECK DATE: 10/19/2021									
19944655-2		10/01/2021	101921	339948	29.26	10/31/2021	INV	PD	Knives and teaspoons for
CHECK DATE: 10/19/2021									
20051135		10/06/2021	101921	339948	33.76	11/05/2021	INV	PD	Coffee Mate Creamers for
CHECK DATE: 10/19/2021									
20118995		10/08/2021	101921	339948	48.99	11/07/2021	INV	PD	Purell spray bottles for
CHECK DATE: 10/19/2021									



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
101684 R & R SPECIALTIES OF WISCONSIN INC					273.80				
0073562-IN		09/28/2021	101921	339949	42.50	10/28/2021	INV	PD	Zamboni blade sharpening
CHECK DATE:	10/19/2021								
110119 ISAAC KAUFMAN									
000059		10/02/2021	101921	339950	1,955.00	11/02/2021	INV	PD	INVESTIGATION
CHECK DATE:	10/19/2021								
101631 REINDERS INC									
3083262-00		09/20/2021	101921	339951	95.87	10/20/2021	INV	PD	HAND PUMP
CHECK DATE:	10/19/2021								
3083300-00		09/21/2021	101921	339951	-86.40	10/20/2021	CRM	PD	CREDIT FOR HAND PUMP
CHECK DATE:	10/19/2021								
					9.47				
107697 RIVERS EDGE CONCRETE LLC									
C2416495		09/16/2021	101921	339952	1,190.00	10/17/2021	INV	PD	BRIDGE FOOTINGS - MABLE C
CHECK DATE:	10/19/2021								
C2419948		09/22/2021	101921	339952	2,159.00	10/23/2021	INV	PD	CORTINA WOODS PK IMP-CONC
CHECK DATE:	10/19/2021								
					3,349.00				
102948 ROAD MACHINERY & SUPPLIES CO									
S68402020		08/10/2021	101921	339953	146.94	10/13/2021	INV	PD	#147 PAVER SEAL KIT
CHECK DATE:	10/19/2021								
107494 ROBERT THOMAS HOMES									
10005397-8		09/29/2021	101921	339954	109.76	10/29/2021	INV	PD	CREDIT BALANCE REFUND-643
CHECK DATE:	10/19/2021								
101673 ROCHESTER MIDLAND CORP									
INV00279611		09/28/2021	101921	339955	22.86	10/28/2021	INV	PD	FIREMAN'S PARK-JUL
CHECK DATE:	10/19/2021								
INV00279907		09/28/2021	101921	339955	22.86	10/28/2021	INV	PD	FIREMAN'S PARK-AUG
CHECK DATE:	10/19/2021								
INV00279908		09/29/2021	101921	339955	22.86	10/29/2021	INV	PD	FIREMAN'S PARK-SEP



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City of Chaska
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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
CHECK DATE: 10/19/2021									
INV00281194		10/05/2021	101921	339955	799.20	11/04/2021	INV	PD	CITY HALL ANNUAL CONTRACT
CHECK DATE: 10/19/2021									
INV00281963		10/05/2021	101921	339955	740.96	11/04/2021	INV	PD	MSB ANNUAL CONTRACT RENEW
CHECK DATE: 10/19/2021									
101738 SCHILLING SUPPLY COMPANY					1,608.74				
844702-00		10/07/2021	101921	339956	910.06	11/07/2021	INV	PD	Cleaning Supplies-CCC
CHECK DATE: 10/19/2021									
101744 SCOTT COUNTY TREASURER									
IN27303		08/11/2021	101921	339957	450.00	10/11/2021	INV	PD	Range training for new of
CHECK DATE: 10/19/2021									
IN27445		10/01/2021	101921	339957	1,050.00	10/28/2021	INV	PD	BURN TOWER TRAINING
CHECK DATE: 10/19/2021									
109947 SHELTERTECH CORPORATION					1,500.00				
11703-T		09/27/2021	101921	339958	1,940.00	10/27/2021	INV	PD	ASBESTOS ABATEMENT 4255 C
CHECK DATE: 10/19/2021									
110116 SINCLAIR, CHRIS									
35208		09/29/2021	101921	339959	114.14	10/29/2021	INV	PD	CREDIT BALANCE REFUND-291
CHECK DATE: 10/19/2021									
104547 SITEONE LANDSCAPE SUPPLY HOLDING LLC									
113318248-001		09/28/2021	101921	339960	726.90	10/28/2021	INV	PD	IRRIGATION SUPPLIES PARKS
CHECK DATE: 10/19/2021									
113362043-001		09/29/2021	101921	339960	180.24	10/29/2021	INV	PD	MOUND CLAY FOR COMM AND S
CHECK DATE: 10/19/2021									
113638351-001		10/07/2021	101921	339960	73.79	11/15/2021	INV	PD	IRRIGATION SUPPLIES FOR P
CHECK DATE: 10/19/2021									
101828 SOUTHWEST NEWS MEDIA					980.93				
2144121		09/16/2021	101921	339961	63.63	10/25/2021	INV	PD	DELINQUENT UTILITIES ASSE
CHECK DATE: 10/19/2021									



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City of Chaska
VENDOR INVOICE LIST

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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
2144669 CHECK DATE: 10/19/2021		09/23/2021	101921	339961	134.33	10/25/2021	INV	PD	SOLICITOR FEES, GAMBLING
2144849 CHECK DATE: 10/19/2021		09/30/2021	101921	339961	572.67	10/25/2021	INV	PD	ELECTRIC RATES ORD
2144850 CHECK DATE: 10/19/2021		09/30/2021	101921	339961	106.05	10/25/2021	INV	PD	RIGHT-OF-WAY FEE ORD
2144851 CHECK DATE: 10/19/2021		09/30/2021	101921	339961	38.89	10/25/2021	INV	PD	PLAT/REZONE WAGNER WOODS-
					915.57				
101850 STANTEC CONSULTING SERVICES INC									
1839578 CHECK DATE: 10/19/2021		09/30/2021	101921	339962	11,813.75	10/30/2021	INV	PD	JUL-GENERAL ENGINEERING
1839579 CHECK DATE: 10/19/2021		09/30/2021	101921	339962	647.50	10/30/2021	INV	PD	JUL-2021 GENERAL ENGINEER
1839580 CHECK DATE: 10/19/2021		09/30/2021	101921	339962	348.00	10/30/2021	INV	PD	JUL-MSA
1839581 CHECK DATE: 10/19/2021		09/30/2021	101921	339962	13,239.25	10/30/2021	INV	PD	JUL-RECORD PLAN/BASE MAP
1839582 CHECK DATE: 10/19/2021		09/30/2021	101921	339962	22,818.68	10/30/2021	INV	PD	JUL-MCKNIGHT WETLAND BANK
1839583 CHECK DATE: 10/19/2021		09/30/2021	101921	339962	995.00	10/30/2021	INV	PD	JUL-SW COMMUNITY PARK
1839584 CHECK DATE: 10/19/2021		09/30/2021	101921	339962	5,218.50	10/30/2021	INV	PD	JUL-CREEK RD TRUNK SWR PH
1839585 CHECK DATE: 10/19/2021		09/30/2021	101921	339962	4,652.00	10/30/2021	INV	PD	JUL-NE COLLECTOR IN SW AR
1839586 CHECK DATE: 10/19/2021		09/30/2021	101921	339962	1,070.70	10/30/2021	INV	PD	JUL-LAKE GRACE TRAIL PHAS
1839587 CHECK DATE: 10/19/2021		09/30/2021	101921	339962	719.00	10/30/2021	INV	PD	JUL-E 6TH ST L4965 REPLAC
1839588 CHECK DATE: 10/19/2021		09/30/2021	101921	339962	12,363.59	10/30/2021	INV	PD	JUL-2020 DT RECONSTRUCTIO
1839589 CHECK DATE: 10/19/2021		09/30/2021	101921	339962	57,442.43	10/30/2021	INV	PD	JUL-PAR 30 GOLF COURSE
1839590 CHECK DATE: 10/19/2021		09/30/2021	101921	339962	64,569.34	10/30/2021	INV	PD	JUL-2021 DT RECONSTRUCTIO



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VENDOR INVOICE LIST

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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
1839591 CHECK DATE: 10/19/2021		09/30/2021	101921	339962	14,319.10	10/30/2021	INV	PD	JUL-OAK ST PUMPING STATIO
1839592 CHECK DATE: 10/19/2021		09/30/2021	101921	339962	2,864.00	10/30/2021	INV	PD	JUL-OPPIDAN SITE TRUNK SA
1839593 CHECK DATE: 10/19/2021		09/30/2021	101921	339962	6,610.50	10/30/2021	INV	PD	JUL-CREEK RD INDUST ST &
1839594 CHECK DATE: 10/19/2021		09/30/2021	101921	339962	104,930.58	10/30/2021	INV	PD	JUL-CLOVER RIDGE DR/FREY
1839595 CHECK DATE: 10/19/2021		09/30/2021	101921	339962	2,349.00	10/30/2021	INV	PD	JUL-SEMINARY FEN C2 RAVIN
1839596 CHECK DATE: 10/19/2021		09/30/2021	101921	339962	601.25	10/30/2021	INV	PD	JUL-STORMWATER REVIEW-HAR
1839597 CHECK DATE: 10/19/2021		09/30/2021	101921	339962	589.50	10/30/2021	INV	PD	JUL-STORMWATER REVIEW-CHA
1839598 CHECK DATE: 10/19/2021		09/30/2021	101921	339962	832.50	10/30/2021	INV	PD	JUL-STORMWATER REVIEW-CHA
1839599 CHECK DATE: 10/19/2021		09/30/2021	101921	339962	1,480.00	10/30/2021	INV	PD	JUL-STORMWATER REVIEW-CAN
1839600 CHECK DATE: 10/19/2021		09/30/2021	101921	339962	878.75	10/30/2021	INV	PD	JUL-STORMWATER REVIEW-RES
					331,352.92				
101861 STATE SUPPLY COMPANY									
608788 CHECK DATE: 10/19/2021		10/05/2021	101921	339963	309.48	11/04/2021	INV	PD	Seals & Gaskets for Boile
102984 STEVE'S CURLING SUPPLIES LLC									
8835 CHECK DATE: 10/19/2021		10/07/2021	101921	339964	605.35	11/07/2021	INV	PD	Curling resale merch/staf
101892 STUART C IRBY CO									
S012314632.003 CHECK DATE: 10/19/2021	210137	09/29/2021	101921	339965	11,806.00	10/29/2021	INV	PD	TRNSFRMRS 50, 37.5 & 25 K
S012587242.002 CHECK DATE: 10/19/2021	210128	09/15/2021	101921	339965	5,724.00	10/15/2021	INV	PD	FUSES SMU 80, 65 & 20AMP
S012645883.001 CHECK DATE: 10/19/2021	210133	09/23/2021	101921	339965	674.12	10/23/2021	INV	PD	(4) PED UPRIGHT PLASTIC W



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
S012648531.001 CHECK DATE: 10/19/2021		09/27/2021	101921	339965	441.25	10/27/2021	INV	PD	RUBBER PROTECTORS AND BAG
					18,645.37				
101898 SUN MOUNTAIN SPORTS 784606 CHECK DATE: 10/19/2021		09/23/2021	101921	339966	162.00	10/23/2021	INV	PD	RESALE
101925 TALLMAN EQUIPMENT CO INC 3297301 CHECK DATE: 10/19/2021		09/27/2021	101921	339967	1,196.15	10/27/2021	INV	PD	TOOL BOARDS FOR BUCKET TR
101932 TAYLOR MADE GOLF CO INC 35358805 CHECK DATE: 10/19/2021		09/30/2021	101921	339968	257.01	10/30/2021	INV	PD	RESALE
101964 PMT EMBROIDERY LLC 18808 CHECK DATE: 10/19/2021		09/22/2021	101921	339969	90.00	10/22/2021	INV	PD	Wolf- Embroidery
18829 CHECK DATE: 10/19/2021		10/06/2021	101921	339969	544.00	11/06/2021	INV	PD	LOGO WORK CAPS-BLDG INSPE
					634.00				
104908 TIMESAVER OFF SITE SECRETARIAL INC M26749 CHECK DATE: 10/19/2021		09/29/2021	101921	339970	374.00	11/04/2021	INV	PD	Council & EDA Minutes Sep
110111 TORRES, ELIZABETH 10003187 CHECK DATE: 10/19/2021		09/29/2021	101921	339971	151.91	10/29/2021	INV	PD	CREDIT BALANCE REFUND-288
101990 KANDI KOUNTRY EXPRESS LTD 443237 CHECK DATE: 10/19/2021		10/04/2021	101921	339972	8.16	11/03/2021	INV	PD	#115 BOLT
101989 TOWN & COUNTRY GLASS INC 12606		09/29/2021	101921	339973	8,540.00	10/29/2021	INV	PD	3 Locker Room doors, 1 St



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
CHECK DATE: 10/19/2021									
101995 TRANE									
312052229		09/23/2021	101921	339974	2,959.00	10/23/2021	INV	PD	CHILLER REPAIR, CONDENSER
CHECK DATE: 10/19/2021									
312077995		10/01/2021	101921	339974	1,488.00	11/01/2021	INV	PD	CITY HALL QTRLY SVC AGREE
CHECK DATE: 10/19/2021									
					4,447.00				
103946 TRANSUNION RISK AND ALTERNATIVE DATA SOLUTIONS INC									
1549467-202109-1		10/01/2021	101921	339975	135.30	11/15/2021	INV	PD	Data Processing
CHECK DATE: 10/19/2021									
106577 TWIN CITY HARDWARE COMPANY INC									
PSI2066956		09/08/2021	100521-2	339809	495.33	10/08/2021	INV	PD	Lock for Womens Hockey Lo
CHECK DATE: 10/05/2021									
PSI2072323		09/30/2021	101921	339976	42.34	10/30/2021	INV	PD	DOOR LOCK GIRLS LOCKER RO
CHECK DATE: 10/19/2021									
					537.67				
103085 TWIN CITY SEED CO									
50799		10/05/2021	101921	339977	765.00	11/05/2021	INV	PD	PAR 30 GRASS SEED
CHECK DATE: 10/19/2021									
110053 TX CHILD SUPPORT SDU									
PR100821 0012725283		10/08/2021	101221	339818	147.69	10/08/2021	INV	PD	100821 Payroll Child Supp
CHECK DATE: 10/12/2021									
102033 TYLER TECHNOLOGIES INC									
045-355232		09/24/2021	101921	339978	1,600.00	11/08/2021	INV	PD	PACE UPGRADE ASSISTANCE
CHECK DATE: 10/19/2021									
102037 ULINE INC									
139171504		09/27/2021	101921	339979	215.20	10/27/2021	INV	PD	Nitrile Gloves-CCC
CHECK DATE: 10/19/2021									
139199263		09/27/2021	101921	339979	440.11	10/27/2021	INV	PD	Spill Platform for Chlori
CHECK DATE: 10/19/2021									



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
					655.31				
102056 GREAT RIVER ENERGY									
M1 19630 CHECK DATE: 10/19/2021		09/29/2021	101921	339980	3,557.61	10/29/2021	INV	PD	WEST CREEK RTAC INSTALLAT
102051 UPS									
000027V7Y7391 CHECK DATE: 10/07/2021		09/25/2021	100721	339813	11.43	10/06/2021	INV	PD	SHIPPING-TC
000027V7Y7401-2021 CHECK DATE: 10/14/2021		10/02/2021	101421	339827	18.00	10/13/2021	INV	PD	SHIPPING-TC
					29.43				
102064 US BANK									
6267400 CHECK DATE: 10/19/2021		09/24/2021	101921	339981	450.00	10/24/2021	INV	PD	2017A TRUSTEE FEE
6267656 CHECK DATE: 10/19/2021		09/24/2021	101921	339981	500.00	10/24/2021	INV	PD	2020C PAYING AGENT FEE
6267657 CHECK DATE: 10/19/2021		09/24/2021	101921	339981	500.00	10/24/2021	INV	PD	2020D PAYING FEE
6272657 CHECK DATE: 10/19/2021		09/24/2021	101921	339981	1,700.00	10/24/2021	INV	PD	2020E TRUSTEE FEE
					3,150.00				
104522 US FOODS INC									
4258327 CHECK DATE: 10/19/2021		08/25/2021	101921	339982	364.52	09/24/2021	INV	PD	TP, TOWELS, SOAP-TC
4902969 CHECK DATE: 10/19/2021		09/24/2021	101921	339982	239.77	10/24/2021	INV	PD	ICE TOTES & SCOOPS FOR TC
4973707 CHECK DATE: 10/19/2021		09/29/2021	101921	339982	364.52	10/29/2021	INV	PD	OAK 19 TOWELS & SOAP
5936394 CHECK DATE: 10/19/2021		08/25/2021	101921	339982	176.34	09/25/2021	INV	PD	JUL OAK 19 DISH MACHINE R
5988391 CHECK DATE: 10/19/2021		09/27/2021	101921	339982	176.34	10/27/2021	INV	PD	AUG OAK 19 DISH MACHINE R
					1,321.49				
107687 UNIVERSAL PROTECTION SERVICE LP									



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
11496190 CHECK DATE: 10/19/2021		07/01/2021	101921	339983	157.35	08/01/2021	INV	PD	Event Ctr Security 6/25-7
102061 USA BLUE BOOK									
727910 CHECK DATE: 10/19/2021		09/15/2021	101921	339984	237.22	10/15/2021	INV	PD	PADLOCKS FOR PARK DEPT
103039 MARK BEAUCHAMP									
15922UFS CHECK DATE: 10/19/2021		10/06/2021	101921	339985	3,500.00	11/05/2021	INV	PD	RATE DESIGN FOR 2022
102102 VERIZON WIRELESS									
9889084560 CHECK DATE: 10/05/2021		09/23/2021	100521-2	339810	633.44	10/15/2021	INV	PD	SEP CRADLEPOINTS
102104 VESSCO INC									
085553 CHECK DATE: 10/19/2021		09/23/2021	101921	339986	218.63	10/23/2021	INV	PD	WTP PM KIT
102227 ONVOY LLC									
0009426211001 CHECK DATE: 10/14/2021		10/01/2021	101421	339828	1,853.53	10/25/2021	INV	PD	OCT EDU CTR INTERNET/ETHE
0009486211001 CHECK DATE: 10/14/2021		10/01/2021	101421	339828	889.21	10/25/2021	INV	PD	OCT CITY HALL ETHERNET
102133 WAGNER PRESS & GRAPHICS					2,742.74				
34540 CHECK DATE: 10/05/2021		09/16/2021	100521-2	339811	150.00	10/01/2021	INV	PD	Fire & Ice Flyers
34613 CHECK DATE: 10/19/2021		10/05/2021	101921	339987	153.00	11/05/2021	INV	PD	SEWER AND WATER PERMITS
102141 WASTE MANAGEMENT OF MINNESOTA INC					303.00				
7563458-1593-7 CHECK DATE: 10/14/2021		10/05/2021	101421	339829	344.66	11/04/2021	INV	PD	TOWN COURSE MAINTENANCE
102166 WESCO DISTRIBUTION INC									



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
819748 CHECK DATE: 10/19/2021	210135	08/02/2021	101921	339988	775.17	09/02/2021	INV	PD	(81) PREFORM TIE 336 ACSR
102189 WM MUELLER & SONS									
20210191 CHECK DATE: 10/19/2021		09/30/2021	101921	339989	332,443.78	10/30/2021	INV	PD	2021 MILL AND OVERLAY PRO
270196 CHECK DATE: 10/19/2021		09/27/2021	101921	339989	1,101.42	10/25/2021	INV	PD	LIBERTY HEIGHTS VALVE DIG
270327 CHECK DATE: 10/19/2021		09/29/2021	101921	339989	174.87	10/25/2021	INV	PD	MANHOLE/VALVE/POTHOLE PAT
270393 CHECK DATE: 10/19/2021		09/30/2021	101921	339989	87.00	10/25/2021	INV	PD	MANHOLE/VALVES/POTHOLE PA
					333,807.07				
102220 XIGENT SOLUTIONS LLC									
81741 CHECK DATE: 10/19/2021		10/04/2021	101921	339990	6,715.00	11/08/2021	INV	PD	OCT RECOVERY SVC
81742 CHECK DATE: 10/19/2021		10/04/2021	101921	339990	13,914.69	11/08/2021	INV	PD	OCT SUPPORT SVC
81743 CHECK DATE: 10/19/2021		10/04/2021	101921	339990	1,778.44	11/08/2021	INV	PD	OCT VULNERABILITY SVC
					22,408.13				
105150 ZAYO GROUP HOLDINGS INC									
2021100011266 CHECK DATE: 10/14/2021		10/01/2021	101421	339830	6,116.77	10/31/2021	INV	PD	FIBER MAINTENANCE
102228 ZEE MEDICAL SERVICE INC									
54129284 CHECK DATE: 10/19/2021		09/27/2021	101921	339991	491.65	10/27/2021	INV	PD	AED BATTERY-CCC
					491.65				
311 INVOICES					2,668,979.54				

** END OF REPORT - Generated by Michelle Robbin **

Electronic Payments



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
100385 CHASKA FIRE DEPT RELIEF ASSN									
2021/1005 AID CHECK DATE: 10/05/2021		10/01/2021	100521	2954	179,873.77	10/05/2021	DIR	PD	REMIT FIRE AID TO CFDRA
107490 GREAT-WEST LIFE & ANNUITY INSURANCE COMPANY									
94080 CHECK DATE: 10/12/2021		10/08/2021	101221	2960	1,834.03	10/12/2021	DIR	PD	100821 Payroll - HCSP Con
107744 GREAT-WEST LIFE & ANNUITY INSURANCE COMPANY									
94081 CHECK DATE: 10/12/2021		10/08/2021	101221	2961	400.00	10/12/2021	DIR	PD	100821 Payroll - MNDP Co
101756 MII LIFE INCORPORATED									
39980945 CHECK DATE: 10/07/2021		10/05/2021	100721	2955	1,270.04	10/07/2021	DIR	PD	10/7/21 FSA REIMBURSEMENT
100927 INTERNAL REVENUE SERVICE									
94074 CHECK DATE: 10/08/2021		10/08/2021	100821	2956	141,728.50	10/08/2021	DIR	PD	100821 Payroll - SS, Medi
101343 MINNESOTA DEPT OF REVENUE-PAYROLL WIRES									
94075 CHECK DATE: 10/12/2021		10/08/2021	101221	2959	27,332.48	10/12/2021	DIR	PD	100821 Payroll - MN State
101376 NATIONWIDE RETIREMENT SOLUTIONS(USCM)									
94076 CHECK DATE: 10/08/2021		10/08/2021	100821	2957	11,943.31	10/08/2021	DIR	PD	100821 Payroll - 457 Cont
106955 NATIONWIDE RETIREMENT SOLUTIONS(USCM)									
94079 CHECK DATE: 10/08/2021		10/08/2021	100821	2958	4,554.15	10/08/2021	DIR	PD	100821 Payroll - Roth Con
104668 OPTUM BANK INC									
94078 CHECK DATE: 10/13/2021		10/08/2021	101321	2963	20,734.12	10/13/2021	DIR	PD	100821 Payroll - HSA Cont



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INVOICE	P.O.	INV DATE	CHECK RUN	CHECK #	INVOICE NET	DUE DATE	TYPE	STS	INVOICE DESCRIPTION
101506 PUBLIC EMPLOYEES RETIREMENT ASSOCIATION									
94077		10/08/2021	101221	2962	101,247.64	10/12/2021	DIR	PD	100821 Payroll - PERA Con
CHECK DATE: 10/12/2021									
					101,247.64				
10 INVOICES					490,918.04				

** END OF REPORT - Generated by Michelle Robbin **

Council Update

Downtown Highway 41 Project

October 18, 2021

Fire and Ice Festival

Our team hosted a pop-up event at the Fire and Ice Festival on Saturday, October 16, from 12-4 p.m. At this event, we shared an update on progress to date and what to expect over the next few months. We also shared additional information, such as project renderings, schedule, and more. Stay tuned for future updates for a summary of the event.

Next steps

The previous council update stated that the next open house would be held in November. This has been changed to January 2021 in an effort to have a more finalized vision of the construction staging.

The project team is currently working with the city to develop detailed construction staging plans. Once these plans are complete, we will preview these plans with the CDBA to get their feedback. When the staging is finalized, our team will be hosting an open house in January 2021 to share the construction staging, detours, and how to stay informed during construction. Stay tuned for more information once we select a date.

We continue to promote and encourage the community to sign up for notifications at DowntownHwy41.com or to reach project staff at:

Hotline: 612-269-4638

Email: downtownHwy41@bolton-menk.com

Facebook: [Downtown Highway 41 Project](https://www.facebook.com/DowntownHighway41Project)

**Biweekly Report
October 18, 2021
By
Matt Podhradsky**

UPCOMING COUNCIL MEETING SCHEDULE

Below is a reminder of the Council Meetings and Work Sessions we have coming up:

- October 18th:
 - Regular Council Meeting at 7:00 pm
 - NOTE: This meeting we plan to have at the Chaska Event Center as we expect a large crowd due to the Preliminary Plans coming back for consideration on the Lennar Project on the Wagener Property adjacent to Autumn Woods.
 - There will be no Work Session prior to this meeting
- November 1st:
 - There will be a Work Session from 5:30-7 pm to go over the Budget presentations for our Utility Funds (Electric, Water, Sewer and Storm)
 - There will be a regular meeting to follow. We will be back in the Council Chambers for this meeting

November 15th and 29th: We will have a Council meeting on November 15th. It is uncertain whether we will need a Council meeting on the 29th. However, at this point, we are planning on having a Work Session on both dates to go over the Budgets for our Recreational Enterprise Funds. Our thought currently is to have a review of the Golf and Curling Center Budgets at the meeting on the 15th and the Community Center on the 29th. As we get closer to these dates, I will let you know the specific details.

If you have any questions, or if you are unable to make it to any of these meetings, just let me know so we can plan accordingly.

RETIREMENT ANNOUNCED FOR FIRE CHIEF

As most of you are aware now, Fire Chief Tim Wiebe did announce his intentions this past week for his retirement from the City of Chaska. His plan is to retire at the beginning of February of this upcoming year.

I want to take this opportunity to thank Chief Wiebe for his service to our community. Tim served many roles in our organization over the years having started as a Maintenance Worker in the Public Works Department and serving as the head of that department for 13 years. Tim served in the role of volunteer Fire Chief until 2010 when he retired from Paid on Call service and came back into the fire service in 2013 as our first full-time Fire Chief in Chaska's 150-year history.

Being the first full-time Fire Chief in a paid-on-call department with that much history is not an easy thing to do. Tim approached the role with a lot of passion for the department and with an

underlying goal of how to preserve a paid-on-call base system while supplementing it with strategic full-time staff to make it possible to continue to be able to recruit volunteers from our community. Tim did a fantastic job in accomplishing this and setting this department on a course to be successful with this in the future. He will definitely leave a legacy that will outlive his official service to our community. I will greatly miss Tim's leadership within our organization and his passion for our community and the fire service. I wish him best of luck in his retirement.

Within the next couple of weeks, I will be coming out with a plan with both how we handle this interim period and how we plan to move forward with permanently filling this position. I will make sure to share this with you as we finalize this plan.

If there are any questions, please do not hesitate to ask.

Lease Program with Enterprise Fleet Management

City staff has met with Enterprise Fleet Management (EFM) to review their vehicle lease program to determine if this program could be beneficial for investing and maintaining vehicles. Under the program, EFM would assume management for the purchasing, tax, title, and licensing process for procuring vehicles and would also be responsible for selling vehicles that are turning over in the fleet. The vehicles would be purchased under the state contract and savings would be realized as vehicles are sold to maximize potential resale based on the vehicle life cycle.

Some of the benefits to the program include:

- Reduction in staff time to administer the buying/selling process
- Reduced maintenance costs as most vehicles would be under warranty when leased
- Improved fuel economy with newer vehicles
- Improved fleet safety for the operators and public
- Provide a sustainable fleet cost that is more predictable
- Reduction in time to obtain vehicles due to bulk purchasing power of EFM

City staff is considering use of this program for about 35 vehicles from police, building inspections, and certain fire department vehicles.

Overall staff expects that the City will spend about the same as we do now on vehicles but would have newer, more reliable, and safer vehicles with a stable annual expense.

Staff will continue to meet with EFM to review the program and refine the projections with a goal to bring this to council at the November 1, 2021 meeting. If you have any questions on this, do not hesitate to let me know.

UPCOMING EVENTS

A lot of events are planning in the upcoming weeks. Note that some of these events are being held on dates that are later in the year than typical due to COVID protocols that were in place earlier in the year when the event would have occurred:

- Trail of Fun: Once again, the Chaska Parks and Rec Department, in conjunction with Carver County Parks, will be hosting the Trail of Fun event down at Athletic Park on Friday, October 22nd from 5-8 pm. This event has occurred for the past several falls and has been a very popular event attracting hundreds of families. Once again there will be a hayride down the Regional Trail between Chaska and Carver, with many activities occurring within Athletic Park for kids to participate in. To help with the high popularity of the hayrides, riders will be required to have a ticket for the ride which they can reserve on the Park and Recreation reservation system on the City's web site. If you have never been to this event, it has quickly become one of the largest events in the community for the number of people it attracts and is well worth seeing!
- Fall Cleanup Day: On Saturday, October 30th, we will be holding our annual fall cleanup day from 8-2 pm down at Athletic Park. This is an opportunity for residents to be able to get rid of their organic yard debris at no cost, including yard clippings, leaves and small diameter branches from trimming of trees. This program, along with our Spring Cleanup Day, is partially funded through a grant from the Carver County Environmental Services Department utilizing the solid waste dollars collected annually through the County's tax levy.
- Hometown Holiday and Tree Lighting: It is not too early to start planning for the Hometown Holiday event, which will be occurring on Saturday December 4th. This event is put on by the Downtown Business Alliance/Special Services District and is meant to help bring people into the downtown to shop during the Holiday Season. On that Sunday, December 5th, the Tree Lighting Ceremony will occur in Fireman's Park, as well as the annual 100 Club event. With COVID still being an issue, we are exploring the option of a full outdoor event for both programs and will have more details as we get closer to the date. In the meantime, if there are any Council members that are interested in attending the 100 Club event this year, please let me know and we can make sure you are reserved for a ticket.

**City of Chaska
Memorandum**

To: Administration, Mayor and City Council

From: Lisa Nelson
Controller



Date: October 13, 2021

**RE: Financial Reports –
Year-To-Date (YTD) Ending August 31, 2021**

FINACIAL REPORTS

Enclosed are year-to-date financial reports as of 08/31/21.

Each fund includes the adopted budget compared to YTD actuals, and the resulting variance. Also presented is the percentage of actual revenue or expenditures compared to the annual budget.

Each report also includes revenue and expenditures as of 08/31/20. This will allow you to compare each fund's activity to the prior year.

These draft reports include the following revenues and expenditures:

- YTD revenue receipted by the City.
- YTD revenue from invoices issued by the City.
- YTD payroll through August.
- YTD vendor payments that:
 - 1) were previously approved by the City Council, or
 - 2) are pending approval by the Council at the October 18th meeting.
- Administrative charges and allocations
- Workers Comp and Property Insurance allocations.

These draft reports do not include the following revenues and expenditures:

- General investment earnings revenue (allocated at year-end)
- Depreciation expense (recorded at year-end)

GENERAL FUND
REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCES
BUDGET, AMENDED BUDGET, ACTUAL AND PRIOR YEAR TO DATE
FOR THE PERIODS ENDING 8/31/2021 AND 8/31/2020

	2021 ORIGINAL BUDGET	2021 AMENDED BUDGET	ACTUAL AS OF 8/31/2021	VARIANCE POSITIVE (NEGATIVE)	PERCENT OF BUDGET RECEIVED/ EXPENDED	ACTUAL AS OF 8/31/2020
REVENUES:						
Property Taxes *	\$ 7,743,413	\$ 7,743,413	\$ 4,073,236	\$ (3,670,177)	53%	\$ 3,557,679
Franchise Fees:						
Cable TV	300,000	300,000	155,111	(144,889)	52%	75,402
Gas	457,200	457,200	229,024	(228,176)	50%	233,458
Licenses	202,830	191,310	172,294	(19,016)	90%	165,910
Permits:						
Building	724,730	888,598	1,006,563	117,965	113%	435,456
Other Permits	15,798	15,798	13,663	(2,135)	86%	13,629
Intergovernmental:						
Federal	-	-	28,761	28,761		614
State	580,671	580,671	168,536	(412,135)	29%	166,924
Regional, County, School & Local	160,329	160,329	102,344	(57,985)	64%	15,529
Charges For Services:						
General Government	103,340	103,340	71,012	(32,328)	69%	85,765
Public Safety	59,397	59,397	41,886	(17,511)	71%	32,142
Public Works	124,090	124,090	85,745	(38,345)	69%	67,240
Parks & Recreation	172,635	172,635	164,576	(18,059)	90%	66,387
Administrative Charges	4,870,670	4,870,670	4,656,135	(214,535)	96%	4,478,015
Fines And Forfeitures	71,623	61,423	24,054	(37,369)	39%	31,341
Investment Earnings	22,000	22,000	(773)	(22,773)	-4%	(2,284)
Other Revenue	171,950	171,950	155,722	(16,228)	91%	179,918
TOTAL REVENUES	15,780,676	15,922,824	11,137,889	(4,784,935)	70%	9,603,125
EXPENDITURES:						
General Government:						
Mayor & Council	145,078	145,078	71,086	73,992	49%	98,170
Communications	112,115	112,115	41,002	71,113	37%	62,007
Administration	866,591	866,591	525,790	340,801	61%	543,789
Human Resources	286,290	286,290	247,700	38,590	87%	176,231
Elections	5,402	5,402	-	5,402	0%	35,748
Finance/Admin Services	1,666,915	1,666,915	1,055,399	611,516	63%	1,123,364
Information Services & Fiber Sys.	1,337,091	1,337,091	793,440	543,651	59%	853,902
Legal - City Attorney	80,400	80,400	80,620	(220)	100%	77,857
Community Development	366,569	366,569	212,614	153,955	58%	278,118
Engineering	480,685	480,685	324,811	155,874	68%	314,136
Government Buildings	239,710	239,710	159,750	79,960	67%	147,093
Facility Maintenance	476,253	476,253	276,779	199,474	58%	107,679
Total General Government	6,063,099	6,063,099	3,788,991	2,274,108	62%	3,818,094
Public Safety:						
Police	5,146,205	5,139,470	3,419,009	1,720,461	67%	3,226,891
Fire	2,120,171	2,120,171	1,437,021	683,150	68%	1,395,486
Building Inspections (Comm.Dev)	624,651	763,215	543,733	219,482	71%	416,156
Civil Defense	5,756	5,756	2,880	2,876	50%	7,943
COVID-19	-	-	7,726	(7,726)		182,292
Total Public Safety	7,896,783	8,028,612	5,410,369	2,618,243	67%	5,228,768
Public Works:						
Administration	417,742	417,742	294,465	123,277	70%	321,642
Streets & Alleys	1,880,342	1,880,342	893,073	987,269	47%	1,238,686
Snow Removal	247,430	247,430	262,708	(15,278)	106%	156,674
Signs	11,381	11,381	2,596	8,785	23%	3,258
Municipal Services/Building	235,081	235,081	156,108	78,973	66%	119,529
Parks Maintenance	1,218,315	1,218,315	961,207	257,108	79%	929,948
ISD #112 Grounds Maintenance	37,205	37,205	25,095	12,110	67%	23,791
Tree Maintenance	40,720	40,720	31,908	8,812	78%	7,419
Total Public Works	4,088,216	4,088,216	2,627,160	1,461,056	64%	2,800,947
Parks & Recreation:						
Administration	541,424	541,424	347,180	194,244	64%	374,989
Youth Programs	182,178	182,178	118,648	63,530	65%	116,717
Teen Programs	-	-	1,242	(1,242)		-
Adult Programs	97,619	97,619	38,664	58,955	40%	46,366
All Age Programs	-	-	15,872	(15,872)		-
Senior Programs	-	-	198	(198)		-
Beach/Firemen's Park	121,664	121,664	95,714	25,950	79%	50,852
Hockey & Skating Rinks	11,670	11,670	1,071	10,599	9%	10,054
Parks	-	-	38,315	(38,315)		-
Total Parks & Recreation	954,555	954,555	656,904	297,651	69%	598,978
Unallocated	466,623	476,942	54,088	422,854	11%	18,744
Debt Service	3,400	3,400	2,279	1,121		2,279
TOTAL EXPENDITURES	19,472,676	19,614,824	12,539,791	7,075,033	64%	12,467,810
OTHER FINANCING SOURCES (USES):						
Transfers In	4,327,000	4,327,000	2,900,000 **	(1,427,000)	67%	2,783,765
Transfers Out	(635,000)	(635,000)	(280,000)	355,000		-
NET TRANSFERS	3,692,000	3,692,000	2,620,000	(1,072,000)		2,783,765
NET CHANGE IN FUND BALANCES	\$ -	\$ -	\$ 1,218,098	\$ 1,218,098		\$ (80,920)

MOUNT PLEASANT MAINTENANCE FUND
REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCES
BUDGET, ACTUAL AND PRIOR YEAR TO DATE
FOR THE PERIODS ENDING 8/31/2021 AND 8/31/2020

	<u>2021 BUDGET</u>	<u>ACTUAL AS OF 8/31/2021</u>	<u>VARIANCE POSITIVE (NEGATIVE)</u>	<u>PERCENT OF BUDGET RECEIVED/ EXPENDED</u>	<u>PRIOR YEAR YTD ACTUAL 8/31/2020</u>
<u>REVENUES:</u>					
Property Taxes *	\$ 6,000	\$ 3,158	\$ (2,842)	53%	\$ 3,085
Charges For Services/Lot Sales	2,400	3,000	600	125%	1,300
Investment Earnings	300	-	(300)	0%	-
TOTAL REVENUES	<u>8,700</u>	<u>6,158</u>	<u>(2,542)</u>	71%	<u>4,385</u>
<u>EXPENDITURES:</u>					
Current:					
Public Works:					
Professional Services And Charges	8,500	7,080	1,420	83%	8,235
Capital Outlay	5,000	-	5,000	0%	-
TOTAL EXPENDITURES	<u>13,500</u>	<u>7,080</u>	<u>6,420</u>	52%	<u>8,235</u>
NET CHANGE IN FUND BALANCES	<u>\$ (4,800)</u>	<u>\$ (922)</u>	<u>\$ 3,878</u>		<u>\$ (3,850)</u>

* Tax settlements are received from Carver County in June/July and December.

ECONOMIC DEVELOPMENT AUTHORITY (EDA) FUND
REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCES
BUDGET, ACTUAL, AND PRIOR YEAR TO DATE
FOR THE PERIODS ENDING 8/31/21 AND 8/31/20

	2021 BUDGET	ACTUAL AS OF 8/31/21	VARIANCE POSITIVE (NEGATIVE)	PERCENT OF BUDGET RECEIVED/ EXPENDED	PRIOR YEAR YTD ACTUAL 8/31/2020
REVENUES:					
Property Taxes *	\$ 171,598	\$ 89,724	\$ (81,874)	52%	\$ 85,735
Intergovernmental	-	-	-	0%	270,000
Charges For Services	167,435	167,435	-	100%	85,000
Special Assessments	40,000	21,189	(18,811)	53%	22,150
Investment Earnings (Charges)	(5,400)	-	5,400	0%	-
Leases/Rent	32,200	21,452	(10,748)	67%	20,828
TOTAL REVENUES	405,833	299,800	(106,033)	74%	483,713
EXPENDITURES:					
Current:					
Administration:					
Professional Services	23,172	843	22,329	4%	3,740
Other Charges and Special Events	35,347	9,812	25,535	28%	22,926
Remit Grant Revenue	11,603	-	11,603		270,000
Administrative Fees	258,530	258,530	-	100%	160,957
Economic Development Projects/Programs:					
Professional Services	41,303	52,830	(11,527)	128%	53,113
Other Charges and Special Events	19,479	-	19,479	0%	9,129
Debt Service:					
Principal - Promissory Note	13,499	9,061	4,438	67%	8,626
Interest - Promissory Note	2,900	2,139	761	74%	2,574
Capital Outlay	-	-	-		8,858
TOTAL EXPENDITURES	405,833	333,215	72,618	82%	539,923
NET CHANGE IN FUND BALANCES	\$ -	\$ (33,415)	\$ (33,415)		\$ (56,210)

* Tax settlements are received from Carver County in June/July and December.

In 2020, the EDA received a pass-thru grant of \$270,000.

EQUIPMENT ACQUISITION FUND
REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCES
BUDGET, ACTUAL AND PRIOR YEAR TO DATE
FOR THE PERIODS ENDING 8/31/2021 AND 8/31/2020

	2021 BUDGET	ACTUAL AS OF 8/31/21	VARIANCE POSITIVE (NEGATIVE)	PERCENT OF BUDGET RECEIVED/ EXPENDED	PRIOR YEAR YTD AS OF 8/31/2020
REVENUES:					
Property Taxes *	\$ 3,233,159	\$ 208,092	\$ (3,025,067)	6%	\$ 117,849
Charges For Services	4,000	4,000	-	100%	4,000
Interest Earnings	-	47,030	47,030		54,312
Leases (tower)	96,000	111,876	15,876	117%	88,544
Donations/Contributions	-	2,000	2,000		1,650
TOTAL REVENUES	3,333,159	372,998	(2,960,161)	11%	266,355
EXPENDITURES:					
Current:					
General Government	10,000	-	10,000		-
Debt Service:					
Issuance Costs & Fiscal Agent Fees	50,000	-	50,000		-
Capital Outlay:					
Furniture And Equipment					
Communications	10,000	-	10,000	0%	-
Admin. Services-Finance	13,000	-	13,000	0%	-
Admin. Services-Information Services	63,000	37,961	25,039	60%	91,804
Police	82,000	163,132	(81,132)	199%	4,666
Fire	80,000	317,358	(237,358)	397%	-
Public Works	167,000	93,698	73,302	56%	266,155
TOTAL EXPENDITURES	475,000	612,149	(137,149)	129%	362,625
OTHER FINANCING SOURCES (USES):					
Transfers In	28,000	-	(28,000)	0%	-
Transfers Out	(3,865,932)	-	3,865,932	0%	-
Bonds Issued	170,000	-	(170,000)	0%	-
Sale of Capital Assets	-	6,075	6,075		6,150
TOTAL OTHER FINANCING SOURCES (USES)	(3,667,932)	6,075	3,674,007		6,150
NET CHANGE IN FUND BALANCES	\$ (809,773)	\$ (233,076)	\$ 576,697		\$ (90,120)

* Tax settlements are received from Carver County in June/July and December.

ELECTRIC FUND
REVENUES, EXPENSES AND CHANGES IN NET POSITION
BUDGET, ACTUAL AND PRIOR YEAR TO DATE
FOR THE PERIODS ENDING 8/31/2021 AND 8/31/2020

	2021 BUDGET	ACTUAL AS OF 8/31/2021	VARIANCE POSITIVE (NEGATIVE)	PERCENT OF BUDGET RECEIVED / EXPENDED	PRIOR YEAR YTD AS OF 8/31/2020
OPERATING REVENUES:					
Residential Sales	\$ 9,209,000	\$ 7,067,552	\$ (2,151,448)	77%	\$ 5,942,713
Senior Sales	544,000	423,873	(120,127)	78%	364,692
Commercial Sales	1,160,000	771,204	(388,796)	66%	762,807
Industrial Sales	27,032,000	20,585,645	(6,446,355)	76%	17,646,348
Intradepartmental	980,000	826,562	(153,438)	84%	596,711
Service Charges	1,588,000	3,407,889	1,819,889	215%	929,356
Other Sales	187,000	112,225	(74,775)	60%	67,235
TOTAL OPERATING REVENUES	40,700,000	33,184,950	(7,515,050)	82%	26,309,862
OPERATING EXPENSES:					
Purchased Power	25,901,000	21,963,389	3,937,611	85%	19,711,835
Distribution:					
Personnel Services	1,877,202	1,170,666	706,536	62%	1,252,134
Supplies, Services & Other Charges	533,074	410,078	122,996	77%	297,698
Administration:					
Personnel Services	383,798	141,302	242,496	37%	150,007
Supplies, Services & Other Charges	2,966,510	2,973,384	(6,874)	100%	2,716,860
Utility Billing:					
Personnel Services	260,361	163,994	96,367	63%	175,011
Supplies, Services & Other Charges	338,347	187,234	151,113	55%	161,139
Conservation Programs	669,919	245,245	424,674	37%	207,060
Capital Outlay	663,000	549,150	113,850	83%	1,079,682
TOTAL OPERATING EXPENSES	33,593,211	27,804,442	5,788,769	83%	25,751,426
OPERATING INCOME	7,106,789	5,380,508	(1,726,281)		558,436
NON-OPERATING REVENUES:					
Investment Earnings	16,500	(2,161)	(18,661)	-13%	(3,577)
Intergovernmental	-	119	119		28
Gain on Disposal of Capital Assets	-	-	-		1,540
TOTAL NON-OPERATING REVENUES	16,500	(2,042)	(18,542)		(2,009)
NON-OPERATING EXPENSES:					
Debt Service - Principal	502,977	2,160,000	(1,657,023)	429%	-
Debt Service - Principal (Contra Account)	-	(2,160,000)	2,160,000		-
Debt Service - Interest	327,387	129,244	198,143	39%	147,773
Debt Service - Agent Fees	450	850	(400)		-
TOTAL NON-OPERATING EXPENSES	830,814	130,094	700,720	16%	147,773
INCOME (LOSS) BEFORE CONTRIBUTIONS AND TRANSFERS	6,292,475	5,248,372	(1,044,103)		408,654
CAPITAL CONTRIBUTIONS	-	95,284	95,284		328,411
TRANSFERS IN (OUT):					
Transfers In	-	41,463	41,463		-
Transfers (Out)	(6,292,000)	(4,677,000) *	1,615,000		(2,666,760)
TOTAL TRANSFERS IN (OUT)	(6,292,000)	(4,635,537)	1,656,463		(2,666,760)
CHANGE IN NET POSITION	\$ 475	\$ 708,119	\$ 707,644		\$ (1,929,695)

Service Charges are broken out from sales differently in 2021 than 2020

* Transfers out as of 8/31/21 is an estimate

WATER FUND
REVENUES, EXPENSES AND CHANGES IN NET POSITION
BUDGET, ACTUAL AND PRIOR YEAR TO DATE
FOR THE PERIOD ENDED 8/31/2021 AND 8/31/2020

	2021 BUDGET	ACTUAL AS OF 8/31/2021	VARIANCE POSITIVE (NEGATIVE)	PERCENT OF BUDGET RECEIVED/ EXPENDED	PRIOR YEAR YTD AS OF 8/31/2020
OPERATING REVENUES:					
Residential Sales	\$ 1,358,000	\$ 1,358,443	\$ 443	100%	\$ 962,128
Commercial Sales	1,043,000	821,378	(221,622)	79%	613,839
Industrial Sales	518,000	288,611	(229,389)	56%	215,441
Other Sales	459,040	411,352	(47,688)	90%	282,860
TOTAL OPERATING REVENUES	3,378,040	2,879,784	(498,256)	85%	2,074,268
OPERATING EXPENSES:					
Pumping	261,970	273,695	238,275	53%	184,795
Treatment	322,742	250,545	72,197	78%	229,024
Distribution:					
Personnel Services	498,160	334,805	163,355	67%	333,099
Supplies, Services & Other Charges	362,437	190,488	171,949	53%	186,762
Administration:					
Personnel Services	125,732	82,817	42,915	66%	83,179
Supplies, Services & Other Charges	645,538	624,973	20,565	97%	588,640
Utility Billing:					
Personnel Services	130,182	81,998	48,184	63%	87,039
Supplies, Services & Other Charges	66,824	47,194	19,630	71%	52,499
Capital Outlay	290,500	209,566	(169,066)	517%	151,582
TOTAL OPERATING EXPENSES	2,704,085	2,096,081	608,004	78%	1,896,619
OPERATING INCOME	673,955	783,703	109,748	116%	177,649
NON-OPERATING REVENUES:					
Investment Earnings	16,200	(719)	(16,919)	-4%	(3,177)
Intergovernmental	-	4,810	4,810		4,950
Lease - Bountiful Basket	30,600	20,419	(10,181)	67%	20,065
Insurance Claims	-	-	-		17,750
TOTAL NON-OPERATING REVENUES	46,800	24,510	(22,290)	52%	39,588
NON-OPERATING EXPENSES:					
Debt Service - Principal	699,214	95,439	603,775	14%	40,000
Debt Service - Principal (Contra Account)	-	(95,439)	95,439		(40,000)
Debt Service - Interest	331,258	265,341	65,917	80%	213,034
Issuance Costs & Fiscal Agent Fees	-	60	(60)		29,207
Old Water Treatment Plant/Bountiful Basket	1,900	752	1,148		1,781
TOTAL NON-OPERATING EXPENSES	1,032,372	266,153	766,219	26%	244,022
INCOME (LOSS) BEFORE TRANSFERS	(311,617)	542,060	853,677		(26,785)
TRANSFERS IN (OUT):					
Transfers In	506,000	-	(506,000)		-
Transfers (Out)	(117,000)	(43,504)	73,496		(7,941)
NET TRANSFERS IN (OUT)	389,000	(43,504)	(432,504)		(7,941)
CHANGE IN NET POSITION	\$ 77,383	\$ 498,556	\$ 421,173		\$ (34,726)

SEWER FUND
REVENUES, EXPENSES AND CHANGES IN NET POSITION
BUDGET, ACTUAL AND PRIOR YEAR TO DATE
FOR THE PERIODS ENDING 8/31/2021 AND 8/31/2020

	2021 BUDGET	ACTUAL AS OF 8/31/2021	VARIANCE POSITIVE (NEGATIVE)	PERCENT OF BUDGET RECEIVED/ EXPENDED	PRIOR YEAR YTD AS OF 8/31/2020
OPERATING REVENUES:					
Residential Sales	\$ 1,657,900	\$ 1,057,951	\$ (599,949)	64%	\$ 951,308
Commercial Sales	1,130,000	698,785	(431,215)	62%	643,181
Industrial Sales	1,114,500	837,652	(276,848)	75%	622,277
Other Sales	792,350	699,164	(93,186)	88%	501,912
TOTAL OPERATING REVENUE	4,694,750	3,293,552	(1,401,198)	70%	2,718,678
OPERATING EXPENSES:					
Pumping	25,829	10,077	15,752	39%	8,702
Treatment	2,713,317	2,034,988	678,329	75%	2,006,654
Collection:					
Personnel Services	498,160	334,474	163,686	67%	337,760
Supplies, Services & Other Charges	199,387	92,036	107,351	46%	76,433
Administration:					
Personnel Services	125,730	82,817	42,913	66%	83,178
Supplies, Services & Other Charges	631,368	622,653	8,715	99%	578,309
Utility Billing:					
Personnel Services	130,182	81,998	48,184	63%	87,039
Supplies, Services & Other Charges	62,220	44,554	17,666	72%	37,655
Capital Outlay	17,500	17,848	(348)	102%	131,970
TOTAL OPERATING EXPENSES	4,403,693	3,321,445	1,082,248	75%	3,347,700
OPERATING INCOME	291,057	(27,893)	(318,950)		(629,022)
NON-OPERATING REVENUES:					
Investment Earnings	6,700	(114)	(6,814)	-2%	(453)
Intergovernmental	-	75	75		5
TOTAL NON-OPERATING REVENUES	6,700	(39)	(6,739)	-1%	(448)
NON-OPERATING EXPENSES:					
Debt Service - Principal	139,214	203,561	(64,347)	146%	125,000
Debt Service - Principal (Contra Account)	-	(203,561)	203,561		(125,000)
Debt Service - Interest	76,899	129,861	(52,962)	169%	106,758
Issuance Costs & Fiscal Agent Fees	-	265	(265)		3,047
TOTAL NON-OPERATING EXPENSES	216,113	130,126	85,987		109,805
INCOME (LOSS) BEFORE TRANSFERS	81,644	(158,058)	(239,702)		(739,275)
TRANSFERS IN (OUT):					
Transfers (Out)	(177,000)	(67,334)	109,666		(12,291)
CHANGE IN NET POSITION	\$ (95,356)	\$ (225,392)	\$ (130,036)		\$ (751,566)

CHASKA COMMUNITY CENTER FUND
REVENUES, EXPENSES AND CHANGES IN NET POSITION
BUDGET, AMENDED BUDGET, ACTUAL AND PRIOR YEAR TO DATE
FOR THE PERIODS ENDING 8/31/2021 AND 8/31/2020

	2021 ORIGINAL BUDGET	2021 AMENDED BUDGET	ACTUAL AS OF 8/31/2021	VARIANCE POSITIVE (NEGATIVE)	PERCENT OF BUDGET RECEIVED/ EXPENDED	PRIOR YEAR YTD AS OF 8/31/2020
OPERATING REVENUES:						
Admissions	\$ 433,200	\$ 304,664	\$ 76,154	\$ (228,510)	25%	\$ 105,191
Memberships	1,354,292	710,720	440,164	(270,556)	62%	419,828
Rentals	1,126,648	995,973	636,898	(359,075)	64%	629,765
Charges for Services/Lessons	543,960	312,243	172,321	(139,922)	55%	141,243
Other Revenue	143,720	71,510	9,870	(61,640)	14%	56,057
TOTAL OPERATING REVENUE	\$ 3,601,820	\$ 2,395,110	\$ 1,335,407	\$ (1,059,703)	56%	\$ 1,352,084
OPERATING EXPENSES:						
Personnel Services	2,164,659	1,956,291	1,380,278	576,013	71%	1,533,204
Operating Supplies	229,326	229,326	132,263	97,063	58%	209,567
Professional Services	801,931	801,931	707,389	94,542	88%	485,497
Other Charges	211,934	211,934	139,767	72,167	66%	466,022
Capital Outly	175,000	175,000	170,120	4,880	97%	213,936
TOTAL OPERATING EXPENSES	3,582,850	3,374,482	2,529,817	844,665	75%	2,908,226
OPERATING INCOME	18,970	(979,372)	(1,194,410)	(215,038)		(1,556,142)
NON-OPERATING REVENUES:						
Intergovernmental Revenue	-	-	40,000	40,000		-
Investment Earnings (Charges)	(11,900)	(11,900)	9	11,909	0%	133
Sale of Capital Assets	20,000	20,000	-	(20,000)		-
TOTAL NON-OPERATING REVENUES	8,100	8,100	40,009	31,909	494%	133
NON-OPERATING EXPENSES:						
Debt Service - Principal	355,000	355,000	-	355,000	0%	-
Debt Service - Interest	146,320	146,320	99,670	46,650	68%	80,873
Issuance Costs & Fiscal Agent Fees	2,750	2,750	1,700	1,050	62%	3,000
TOTAL NON-OPERATING EXPENSES	504,070	504,070	101,370	402,700	20%	83,873
INCOME (LOSS) BEFORE TRANSFERS	(477,000)	(1,475,342)	(1,255,771)	219,571		(1,639,882)
TRANSFERS IN (OUT):						
Transfers In	477,000	477,000	477,000	-		474,000
CHANGE IN NET POSITION	\$ -	\$ (998,342)	\$ (778,771)	\$ 219,571		\$ (1,165,882)

CHASKA PAR 30 FUND
REVENUES, EXPENSES AND CHANGES IN NET POSITION
BUDGET, ACTUAL, AND PRIOR YEAR TO DATE
FOR THE PERIOD ENDED 8/31/21 AND 8/31/20

	2021 BUDGET	ACTUAL AS OF 8/31/2021	VARIANCE POSITIVE (NEGATIVE)	PRIOR YEAR YTD AS OF 8/31/2020
OPERATING REVENUES:				
Green Fees	\$ -	\$ -	\$ -	\$ 163,074
Cart Rental	-	-	-	13,487
Merchandise & Other Sales	-	-	-	3,658
TOTAL OPERATING REVENUES	-	-	-	180,219
OPERATING EXPENSES:				
Golf - Maintenance Dept:				
Personnel Services	-	-	-	55,049
Supplies, Services & Other Charges	-	4,227	(4,227)	9,540
Golf - Club House:				
Personnel Services	-	-	-	34,937
Supplies, Services & Other Charges	-	579	(579)	35,080
Merchandise for Resale	-	-	-	2,245
Capital Outlay - Golf Course Construction	-	1,640,737	(1,640,737)	337,242
TOTAL OPERATING EXPENSES	-	1,645,543	(1,645,543)	474,093
OPERATING INCOME	-	(1,645,543)	(1,645,543)	(293,874)
NON-OPERATING REVENUES:				
Intergovernmental Revenue	-	76	76	-
Refunds/Reimbursements	-	59	59	-
TOTAL NON-OPERATING REVENUES	-	135	135	-
INCOME (LOSS) BEFORE TRANSFERS	-	(1,645,408)	(1,645,408)	(293,874)
CHANGE IN NET POSITION	\$ -	\$ (1,645,408)	\$ (1,645,408)	\$ (293,874)

Golf course is closed for construction

CHASKA TOWN COURSE FUND
REVENUES, EXPENSES AND CHANGES IN NET POSITION
BUDGET, ACTUAL, AND PRIOR YEAR TO DATE
FOR THE PERIOD ENDED 8/31/21 AND 8/31/20

	2021 BUDGET	ACTUAL AS OF 8/31/2021	VARIANCE POSITIVE (NEGATIVE)	PERCENT OF BUDGET RECEIVED/ EXPENDED	PRIOR YEAR YTD AS OF 8/31/2020
OPERATING REVENUES:					
Green Fees	\$ 1,464,000	\$ 1,469,444	\$ 5,444	100%	\$ 1,340,568
Driving Range	125,000	139,370	14,370	111%	112,877
Golf Rentals	356,000	333,003	(22,997)	94%	250,810
Merchandise	250,000	230,813	(19,187)	92%	160,847
Other Sales	139,000	143,914	4,914	104%	80,292
TOTAL OPERATING REVENUE	<u>\$ 2,334,000</u>	<u>\$ 2,316,544</u>	<u>\$ (17,456)</u>	99%	<u>\$ 1,945,394</u>
OPERATING EXPENSES:					
Golf - Maintenance Dept:					
Personnel Services	698,622	468,145	230,477	67%	423,278
Supplies, Services & Other Charges	283,179	262,429	20,750	93%	216,054
Golf - Club House:					
Personnel Services	534,894	369,884	165,010	69%	351,279
Supplies, Services & Other Charges	333,654	300,942	32,712	90%	326,662
Merchandise for Resale	174,284	203,807	(29,523)	117%	163,110
Capital Outlay	135,500	74,200	61,300	55%	209,030
TOTAL OPERATING EXPENSES	<u>2,160,133</u>	<u>1,679,407</u>	<u>480,726</u>	78%	<u>1,689,413</u>
OPERATING INCOME	<u>173,867</u>	<u>637,137</u>	<u>463,270</u>		<u>255,981</u>
NON-OPERATING REVENUES:					
Investment Earnings (Charges)	<u>(3,300)</u>	<u>-</u>	<u>3,300</u>		<u>-</u>
TOTAL NON-OPERATING REVENUES	<u>(3,300)</u>	<u>-</u>	<u>3,300</u>		<u>-</u>
NON-OPERATING EXPENSES:					
Debt Service - Principal	121,400	-	121,400	0%	-
Debt Service - Interest	30,600	30,399	201	99%	30,009
TOTAL NON-OPERATING EXPENSES	<u>152,000</u>	<u>30,399</u>	<u>121,601</u>	20%	<u>30,009</u>
INCOME (LOSS) BEFORE TRANSFERS	<u>18,567</u>	<u>606,738</u>	<u>588,171</u>		<u>225,972</u>
TRANSFERS IN (OUT):					
Transfers In	<u>-</u>	<u>-</u>	<u>-</u>		<u>12,279</u>
CHANGE IN NET POSITION	<u>\$ 18,567</u>	<u>\$ 606,738</u>	<u>\$ 588,171</u>		<u>\$ 238,251</u>

TURBINE GENERATOR FUND
REVENUES, EXPENSES AND CHANGES IN NET POSITION
BUDGET, ACTUAL, AND PRIOR YEAR TO DATE
FOR THE PERIOD ENDED 8/31/21 AND 8/31/20

	2021 BUDGET	ACTUAL AS OF 8/31/2021	VARIANCE POSITIVE (NEGATIVE)	PERCENT OF BUDGET RECEIVED/ EXPENDED	PRIOR YEAR YTD AS OF 8/31/2020
OPERATING REVENUES:					
Lease Revenue	\$ 2,486,184	\$ 842,118	\$ (1,644,066)	34%	\$ 882,657
OPERATING EXPENSES:					
Professional Services	105,000	97,307	7,693	93%	92,137
Other Charges	229,445	57,361	172,084	25%	56,586
TOTAL OPERATING EXPENSES	334,445	154,668	179,777	46%	148,723
OPERATING INCOME	2,151,739	687,450	(1,464,289)		733,934
NON-OPERATING REVENUES:					
Investment Earnings	-	(142)	(142)		(2,381)
Interfund Loan Payments	104,219	-	(104,219)	0%	-
TOTAL NON-OPERATING REVENUES	104,219	(142)	(104,361)	0%	(2,381)
NON-OPERATING EXPENSES:					
Debt Service - Principal	1,275,000	-	1,275,000	0%	-
Debt Service - Principal (Contra Account)	-	-	-		-
Debt Service - Interest	801,250	400,625	400,625	50%	431,125
Issuance Costs & Fiscal Agent Fees	4,500	-	4,500	0%	-
TOTAL NON-OPERATING EXPENSES	2,080,750	400,625	1,680,125	19%	431,125
INCOME (LOSS) BEFORE TRANSFERS	175,208	286,683	111,475		300,428
TRANSFERS IN (OUT):					
Transfers In	-	-	-		-
Transfers (Out)	-	(41,463)	(41,463)		-
TOTAL TRANSFERS IN (OUT)	-	(41,463)	(41,463)		-
CHANGE IN NET POSITION	\$ 175,208	\$ 245,220	\$ 70,012		\$ 300,428

STORM WATER FUND
REVENUES, EXPENSES AND CHANGES IN NET POSITION
BUDGET, ACTUAL, AND PRIOR YEAR TO DATE
FOR THE PERIODS ENDING 8/31/21 AND 8/31/20

	2021 BUDGET	ACTUAL AS OF 8/31/2021	VARIANCE POSITIVE (NEGATIVE)	PERCENT OF BUDGET RECEIVED/ EXPENDED	PRIOR YEAR YTD AS OF 8/31/2020
OPERATING REVENUES:					
Residential Sales	\$ 1,043,000	\$ 857,656	\$ (185,344)	82%	\$ 739,057
Industrial Sales	788,000	650,259	(137,741)	83%	565,971
All Other Receipts	14,385	7,682	(6,703)	53%	6,458
TOTAL OPERATING REVENUE	1,845,385	1,515,597	(329,788)	82%	1,311,486
OPERATING EXPENSES:					
Collections:					
Personnel Services	366,900	80,781	286,119	22%	113,063
Supplies, Services & Other Charges	348,482	90,581	257,901	26%	115,315
Administration:					
Personnel Services	131,336	86,309	45,027	66%	87,108
Supplies, Services & Other Charges	389,871	390,529	(658)	100%	356,371
Utility Billing:					
Supplies, Services & Other Charges	63,500	45,867	17,633	72%	37,316
Depreciation	30,000	-	30,000	0%	-
Capital Outlay	217,500	64,186	153,314	30%	100,988
TOTAL OPERATING EXPENSES	1,547,589	758,253	789,336	49%	810,161
OPERATING INCOME	297,796	757,344	459,548		501,325
NON-OPERATING REVENUES:					
Investment Earnings (Charges)	6,500	(370)	(6,870)	-6%	(778)
NON-OPERATING EXPENSES:					
Debt Service - Principal	137,333	115,999	21,334	84%	80,000
Debt Service - Principal (Contra Account)	-	(115,999)	115,999		(80,000)
Debt Service - Interest	55,456	87,653	(32,197)	158%	70,476
Issuance Costs & Fiscal Agent Fees	-	175	(175)		2,509
TOTAL NON-OPERATING EXPENSES	192,789	87,828	104,961	46%	72,985
INCOME (LOSS) BEFORE TRANSFERS	111,507	669,146	557,639		427,562
TRANSFERS IN (OUT):					
Transfers In	204,603	-	(204,603)	0%	-
Transfers (Out)	(246,000)	(27,709)	218,291	11%	(5,058)
NET TRANSFERS IN (OUT)	(41,397)	(27,709)	13,688		(5,058)
CHANGE IN NET POSITION	\$ 70,110	\$ 641,437	\$ 571,327		\$ 422,504

CHASKA CURLING AND EVENT CENTER FUND
REVENUES, EXPENSES AND CHANGES IN NET POSITION
BUDGET, AMENDED BUDGET, ACTUAL AND PRIOR YEAR TO DATE
FOR THE PERIODS ENDING 8/31/2021 AND 8/31/2020

	2021 ORIGINAL BUDGET	2021 AMENDED BUDGET	ACTUAL AS OF 8/31/2021	VARIANCE POSITIVE (NEGATIVE)	PERCENT OF BUDGET RECEIVED/ EXPENDED	PRIOR YEAR YTD ACTUAL 8/31/2020
OPERATING REVENUES:						
Memberships	\$ 149,900	\$ 135,350	\$ 77,368	\$ (57,982)	57%	\$ 94,557
Rentals	167,007	99,296	62,913	(36,383)	63%	35,302
Lessons	255,000	131,000	51,418	(79,582)	39%	81,240
Leagues	225,500	180,000	88,580	(91,420)	49%	78,014
Leases	409,000	297,878	191,320	(106,558)	64%	113,546
Other Revenue	52,779	39,484	7,702	(31,782)	20%	23,028
TOTAL OPERATING REVENUES	1,259,186	883,008	479,301	(403,707)	54%	425,687
OPERATING EXPENSES:						
Administration:						
Personnel Services	363,802	363,802	213,057	150,745	59%	232,420
Supplies, Services & Other Charges	362,024	362,024	261,612	100,412	72%	202,157
Event Center:						
Personnel Services	104,317	103,317	64,320	38,997	62%	65,954
Supplies, Services & Other Charges	13,026	13,026	4,395	8,631	34%	12,474
Curling Center:						
Personnel Services	241,991	199,641	119,409	80,232	60%	135,509
Supplies, Services & Other Charges	93,616	93,616	29,916	63,700	32%	49,111
Crooked Pint	58,525	58,525	41,642	16,883	71%	60,802
Capital Outlay	5,000	5,000	-	5,000		-
TOTAL OPERATING EXPENSES	1,242,301	1,198,951	734,351	464,600	61%	758,427
OPERATING INCOME	16,885	(315,943)	(255,050)	60,893		(332,740)
NON-OPERATING REVENUES:						
Investment Earnings (Charges)	(12,154)	(12,154)	59	12,213		692
TOTAL NON-OPERATING REVENUES	(12,154)	(12,154)	59	12,213		692
NON-OPERATING EXPENSES:						
Debt Service-Principal	1,025,000	1,025,000	1,025,000	-	100%	1,000,000
Debt Service-Principal (Contra Account)	-	-	(1,025,000)	1,025,000		(1,000,000)
Debt Service-Interest	559,501	559,501	446,260	113,241	80%	472,636
Issuance Costs & Fiscal Agent Fees	1,600	1,600	3,200	(1,600)	200%	3,200
TOTAL NON-OPERATING EXPENSES	1,586,101	1,586,101	449,460	1,136,641	28%	475,836
INCOME (LOSS) BEFORE TRANSFERS	(1,581,370)	(1,914,198)	(704,451)	1,209,747		(807,884)
TRANSFERS IN (OUT):						
Transfers In	1,586,101	1,586,101	1,260,000	(326,101)	79%	1,254,751
CHANGE IN NET POSITION	\$ 4,731	\$ (328,097)	\$ 555,549	\$ 883,646		\$ 446,867