AGENDA
CHASKA PLANNING COMMISSION
CHASKA EVENT CENTER - 3210 CHASKA BLVD
Wednesday, October 13, 2021
7:00 PM

1. Call to Order
2. Roll Call
3. Adopt Agenda
    3.A. October 13, 2021 Planning Commission Agenda
4. Visitor Presentation
5. Approve Previous Meeting Minutes
    5.A. Approve the Sept 8th, 2021 Planning Commission Meeting Minutes
6. Consent Items
7. Action Items
    7.A. PUBLIC HEARING: Recommend Approval of the Preliminary Plat, Rezoning, and Sale of Excess City Land for Reserve at Autumn Woods/Lennar/PC #2021-16
8. Other Business
    8.A. Receive Other Meeting Minutes
        8.A.i. Receive the Sept 13th and Sept 20th, 2021 City Council Meeting Minutes
        8.A.ii. Receive the Sept 13th and Sept 20th 2021 EDA meeting minutes
        8.A.iii. Receive the Aug 10th and Sept 14th 2021 Park Board Meeting Minutes
9. Adjourn

AGENDA
CHASKA PLANNING COMMISSION
CHASKA EVENT CENTER - 3210 CHASKA BLVD
Wednesday, October 13, 2021
7:00 PM

1. Call to Order
2. Roll Call
3. Adopt Agenda
    3.A. October 13, 2021 Planning Commission Agenda
4. Visitor Presentation
5. Approve Previous Meeting Minutes
    5.A. Approve the Sept 8th, 2021 Planning Commission Meeting Minutes
6. Consent Items
7. Action Items
    7.A. PUBLIC HEARING: Recommend Approval of the Preliminary Plat, Rezoning, and Sale of Excess City Land for Reserve at Autumn Woods/Lennar/PC #2021-16
8. Other Business
    8.A. Receive Other Meeting Minutes
        8.A.i. Receive the Sept 13th and Sept 20th, 2021 City Council Meeting Minutes
        8.A.ii. Receive the Sept 13th and Sept 20th 2021 EDA meeting minutes
        8.A.iii. Receive the Aug 10th and Sept 14th 2021 Park Board Meeting Minutes
9. Adjourn

CHASKA PLANNING COMMISSION
MINUTES
September 8, 2021

1. Call to Order
Chair Dahlke called the meeting to order at 7:02 pm.

2. Roll Call
Roll call was taken. Members present: Commissioners Lacey, Olson, Rylee, Sailer, Urbanski.

Members absent: Commissioner Brass.

Also present: Kevin Ringwald, Community Development Director; and, Liz Hanson, City Planner.

3. Adopt the Agenda
Motion by Commissioner Sailer, second by Commissioner Urbanski to adopt the agenda as presented.
Roll Call Vote: Ayes – all. Motion carried.

4. Visitor Presentation
None.

5. Minutes
Motion by Commissioner Rylee, second by Commissioner Olson, to approve the minutes of the August 11th, 2021 Planning Commission meeting, as presented.
Roll Call Vote: Ayes – all. Motion carried.

6. Consent Items
Motion by Commissioner Lacey, second by Commissioner Sailer, to approve the Consent Agenda as follows:

6.A. Motion to recommend to City Council approval of the Harvest West 3rd Final Plat Amendment/Tradition Development/PC #2021-09 the 92-lot development to include approximately 3.2 acres of dedicated ROW for the future extension of Savanna Way in the SW Chaska Growth Area, subject to the following conditions:

1. Approvals shall be based on the following graphic exhibits:
    a. Tree Damage Assessment (pgs 1-16), prepared by Heritage Shade Tree, dated October 29, 2020
    b. Cover Sheet, prepared by Alliant Engineering, Inc., dated March 29, 2021
    c. Details (pgs 2-3), prepared by Alliant Engineering, Inc., dated March 29, 2021
    d. Existing Conditions (pgs 1-2), prepared by Alliant Engineering, Inc., dated May 2, 2018
    e. Tree Preservation Plan (pgs 6-7), prepared by Alliant Engineering, Inc., dated March 29, 2021
    f. Site Plan – Overall (pg 8), prepared by Alliant Engineering, Inc., dated April 14, 2021
    g. Site Plan (pgs 9-12), prepared by Alliant Engineering, Inc., dated March 29, 2021
    h. Grading and Drainage Plan (pgs 13-17), prepared by Alliant Engineering, Inc., dated March 29, 2021
    i. West Pond Drainage Detail (pg 18), prepared by Alliant Engineering, Inc., dated March 29, 2021

   j. East Pond Drainage Detail (pg 19), prepared by Alliant Engineering, Inc., dated March 29, 2021
   k. Erosion and Sediment Control Plan (pgs 20-23), prepared by Alliant Engineering, Inc., dated March 29, 2021
   l. Erosion and Sediment Control Notes (pg 24), prepared by Alliant Engineering, Inc., dated March 29, 2021
   m. Sanitary Sewer and Watermain Plan (pg 25), prepared by Alliant Engineering, Inc., dated March 29, 2021
   n. Sanitary Sewer and Watermain Plan and Profiles (pgs 26-30), prepared by Alliant Engineering, Inc., dated March 29, 2021
   o. Street and Storm Sewer Plan (pg 31), prepared by Alliant Engineering, Inc., dated March 29, 2021
   p. Street and Storm Sewer Plan and Profiles (pgs 32-36), prepared by Alliant Engineering, Inc., dated March 29, 2021
   q. Street Intersection Details (pg 37), prepared by Alliant Engineering, Inc., dated March 29, 2021
   r. Landscape Plan (pgs 38-43), prepared by Alliant Engineering, Inc., dated March 29, 2021
   s. Final Plat (pgs 1-6), prepared by Alliant Engineering, Inc., undated
2. Adherence with the City Engineer's Memo dated January 13, 2021.
3. Provision of a storm water management plan meeting City and Carver County WMO standards.
4. Prior to final plat approval, developer shall enter into an agreement with the City for the provision of necessary infrastructure and associated development costs.
5. Provision that stormwater ponds, creek areas, wooded steep slopes, and wetlands will not factor into the parkland credit given.
6. Compliance with the City's existing anti-monotony housing policy.
7. Provision that street names are reviewed and approved by the Fire Department prior to recording of plat.
8. Provision of a 60 feet Right of Way width for all local streets.
9. Adherence to the City's Boulevard Tree Policy and local street section design.
10. Provision of sidewalks on both sides of all local streets.
11. Provision of a pedestrian connection at the east development entry for the full extent of Farm Hill Boulevard to connect into the public park as shown on the final plans.
12. 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.
13. Provision that screening on Savanna Way will be provided in the form of landscaping and berming, and consistent with the screening on the east side of Savanna Way.
14. Provision of a safe pedestrian connection at Farm Hill Boulevard and Savanna Way for pedestrians to safely cross and gain access into the public park from neighboring areas, as determined by the Engineering and Public Works departments.
15. Provision that retaining walls that are structural walls will need to be engineer designed prior to release of a grading permit.
16. Provision of obtaining all necessary wetland approvals at time of final plat approval.
17. Adherence to the following building setbacks:
    a. Cottage Lots:
       i. Front (house): 20 feet

ii. Rear: 30 feet
iii. Side: 5 feet
iv. Side (corner): 20 feet

b. Heritage and Tradition Lots:
i. Front (house): 23 feet
ii. Front (porch): 15 feet
iii. Rear: 30 feet
iv. Side: 10 feet house/5 feet garage
v. Side (corner): 23 feet

c. Highway 212: 225 feet from the centerline (from centerline of adjacent travel lane) of TH 212 or 50 feet from right of way (whichever is greater)
d. Savanna Way: 100 feet from the centerline
e. Wetlands: 30 feet
f. Public Park (rear yard only): 40 feet

7. Action Items
None.

8. Other Business
8.A. Receive Other Meeting Minutes

8. A.i. Receive the June 8th and July 13th, 2021 Park Board Meeting Minutes.
8. A.ii. Receive the August 2nd and draft August 16th, 2021 City Council Meeting Minutes.

9. Adjourn
Motion by Commissioner Olson, second by Commissioner Rylee to adjourn the meeting at 7:05 pm.
Motion carried.

REQUEST FOR ACTION
CHASKA PLANNING COMMISSION
10/13/2021

Subject: **Reserve at Autumn Woods (fka Wagner Woods) – Preliminary Plat & 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 recommend approval

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. 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.

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 still needs to be formally approved by Carver County, however. 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 'Venture 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 Venture 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 'Venture 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)

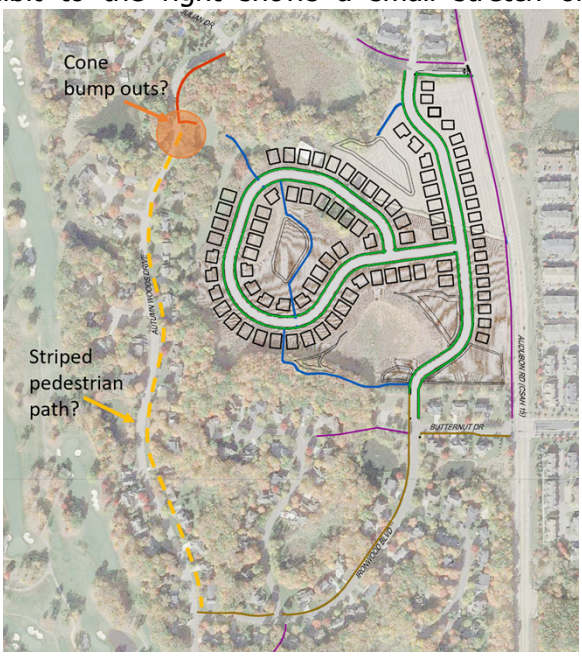
Traffic is a major concern with this proposed development and with the existing Autumn Woods neighborhoods. Because of this it seemed imperative to review traffic calming measures inside and outside of the proposed development to see where (if any) improvements can occur. Staff, the developer and residents 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 Venture 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.

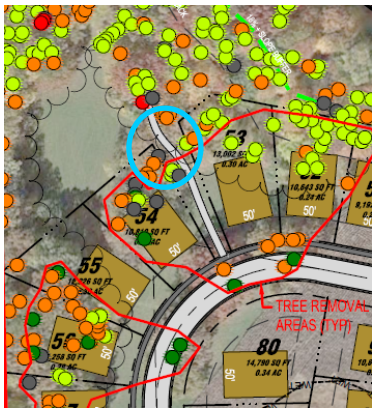
Trails & Sidewalks
There are a couple trails proposed as a part of this development. These trails will be Jonathan owned and maintained. These trails exist on the south side of the site adjacent to the wetland/ponding area, and in the center of the site adjacent to the infiltration basin area. A public 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

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 will meet the day before Planning Commission (Tuesday, October 12th) to review this preliminary plan, and an update from that meeting will be provided at Planning Commission.

Jonathan Association & Update
As noted previously, the Jonathan Association plans to take over this development once its built out. They will be the owners and maintainers of the tree preservation areas, trails, ponds, and other common areas. City staff will meet with the Association the Monday before the Planning Commission meeting to go over where things are at with them, and can provide an update of such meeting on Wednesday.

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

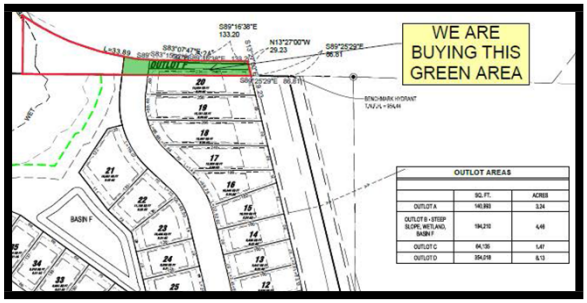
Prior to final platting, the developer will need to work with City Staff to determine which of these are applicable and what those fees will be.

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 REQUESTED:

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 Metzer 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 July 1, 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, including the easterly extension on Ironwood Boulevard to the Butternut Drive intersection.
11. Adherence to the following building setbacks:
    a. Front (house): 25 feet
    b. Rear: 25 feet
    c. Side (Landmark Series and Venture 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.

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.

ORDINANCE NO. xxx

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 AUTUMNS 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 July 1, 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. Lot 1
    b. Lot 8
    c. Lot 9
    d. Lot 20
    e. Lot 28
    f. Lot 29
    g. Lot 40
    h. Lot 41
    i. Lot 64
    j. Lot 65
    k. Lot 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. <u>Monument Signs</u>

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. <u>Outlots</u>

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

<u>Section III</u>. <u>Effective Date.</u> 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.

ONE CITY HALL PLAZA/CHASKA, MN 55318-1962/PH: (952) 448-2851/ FX: (952) 448-9300

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.

ONE CITY HALL PLAZA/CHASKA, MN 55318-1962/PH: (952) 448-2851/ FX: (952) 448-9300

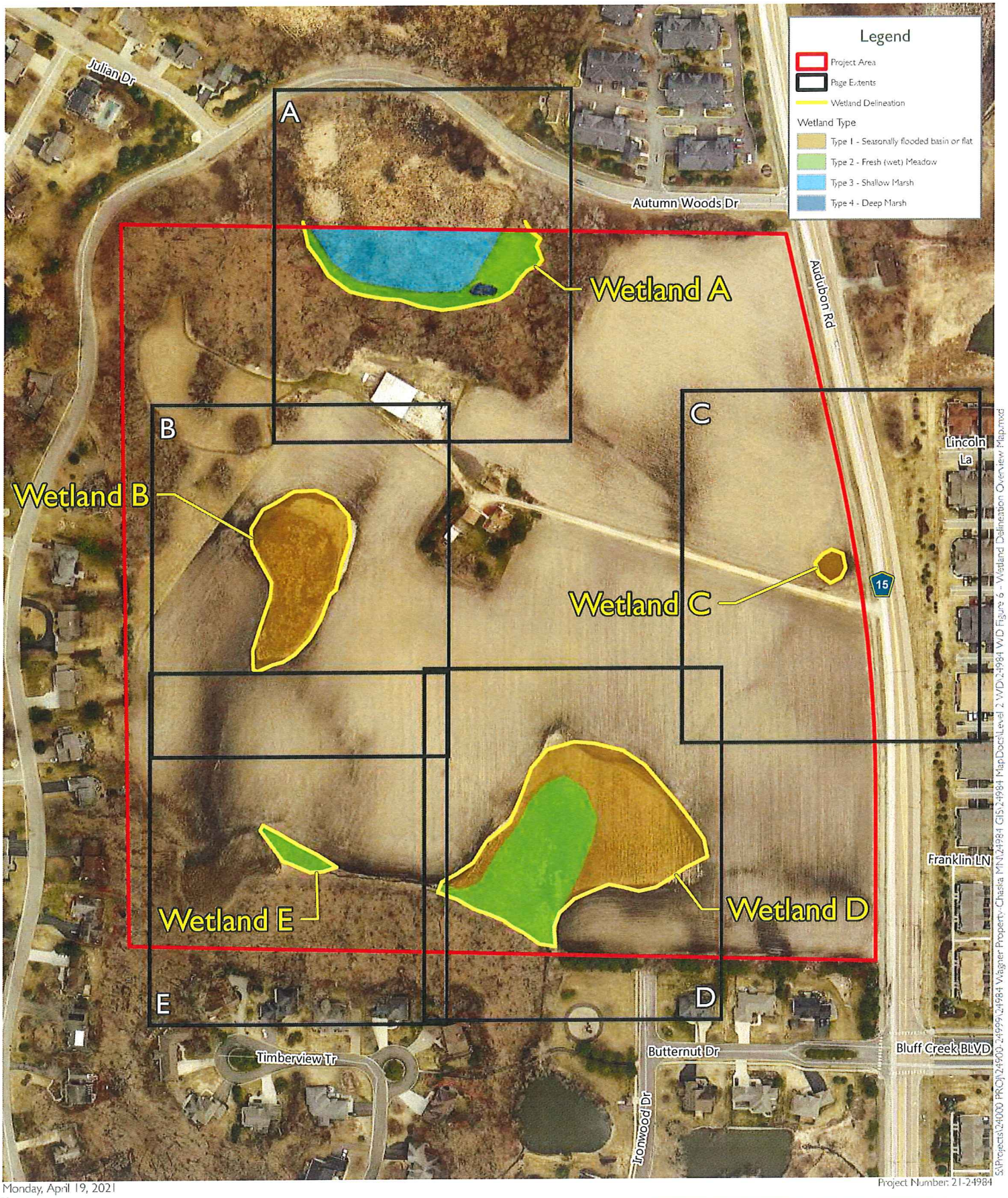


Figure 6

Wetland Delineation Overview Map

Wagner Property

0 125 250 ft

1 in = 250 ft

N

Source(s):
Orthophoto (Carver Co, 2020)
Wetland Delineation (ISG, 2021)

ISG

LENNAR®

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

Discovery Series	
Total Units:	20 lots
Lot Width:	55 feet
Building Width:	40 feet
Bedrooms:	4 to 5 bedrooms
Bathrooms:	3 to 4 bathrooms
Garage:	2-car
Square Footage:	2,440 – 2,690
Base Price Range:	**$450,000 - $500,000
Setbacks:	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, Strom 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

LENNAR

RESERVE AT AUTUMN WOODS

CHASKA, MINNESOTA

PRELIMINARY PLAT SUBMITTAL

ISG PROJECT # 21-24984

PRELIMINARY NOT FOR CONSTRUCTION

LEGEND

EXISTING

- CITY LIMITS
- SECTION LINE
- QUARTER SECTION LINE
- RIGHT OF WAY LINE
- PROPERTY / LOTLINE
- EASEMENT LINE
- ACCESS CONTROL
- WATER EDGE
- WETLAND BOUNDARY
- WETLAND / MARSH
- FENCE LINE
- CULVERT
- STORM SEWER
- SANITARY SEWER
- SANITARY SEWER FORCEMAIN
- WATER
- GAS
- OVERHEAD ELECTRIC
- UNDERGROUND ELECTRIC
- UNDERGROUND TELEPHONE
- UNDERGROUND TV
- OVERHEAD UTILITY
- UNDERGROUND UTILITY
- UNDERGROUND FIBER OPTIC
- CONTOUR (MAJOR)
- CONTOUR (MINOR)
- DECIDUOUS TREE
- CONIFEROUS TREE
- TREE LINE
- MANHOLE/STRUCTURE
- CATCH BASIN
- HYDRANT
- VALVE
- CURB STOP
- POWER POLE
- UTILITY PEDESTAL / CABINET

PROPOSED

- LOT LINE
- RIGHT OF WAY
- EASEMENT
- CULVERT
- STORM SEWER
- STORM SEWER (PIPE WIDTH)
- SANITARY SEWER
- SANITARY SEWER (PIPE WIDTH)
- WATER
- GAS
- OVERHEAD ELECTRIC
- UNDERGROUND ELECTRIC
- UNDERGROUND TV
- CONTOUR
- MANHOLE (STORM, SANITARY)
- CATCH BASIN
- HYDRANT
- VALVE



LOCATION MAP

SCALE IN FEET

0 500 1000

ABBREVIATIONS:

AC	ACRE	CMP	CORRUGATED METAL PIPE	FDN	FOUNDATION	HR	HOUR	MB	MAIL BOX	PVC	POLYVINYL CHLORIDE	TEL	TELEPHONE
ADA	AMERICANS WITH DISABILITIES ACT	CO	CLEANOUT	FFE	FINISHED FLOOR ELEVATION	HWL	HIGH WATER LEVEL	MECH	MECHANICAL	PVMT	PAVEMENT	TEMP	TEMPORARY
ADD	ADDENDUM	CONC	CONCRETE	FPM	FEET PER MINUTE	HWY	HIGHWAY	MH	MANHOLE	QTY	QUANTITY	THRU	THROUGH
AFF	ABOVE FINISHED FLOOR	CONST	CONSTRUCTION	FPS	FEET PER SECOND	HYD	HYDRANT	MIN	MINIMUM	RAD	RADIUS	TNFH	TOP NUT OF FIRE HYDRANT
AGG	AGGREGATE	CONT	CONTINUOUS	FT	FOOT, FEET	I	INVERT	MISC	MISCELLANEOUS	RCP	REINFORCED CONCRETE PIPE	TRANS	TRANSFORMER
APPROX	APPROXIMATE	CY	CUBIC YARD	FTG	FOOTING	ID	INSIDE DIAMETER	NO	NUMBER	RD	ROOF DRAIN	TV	TELEVISION
ARCH	ARCHITECT, ARCHITECTURAL	C&G	CURB AND GUTTER	GA	GAUGE	IN	INCH	NTS	NOT TO SCALE	REBAR	REINFORCING BAR	T/W	TOP OF WALL
BFE	BASEMENT FLOOR ELEVATION	DEMO	DEMOLITION	GAL	GALLON	INV	INVERT	NWL	NORMAL WATER LEVEL	REM	REMOVE	TYP	TYPICAL
BIT	BITUMINOUS	DIA	DIAMETER	GALV	GALVANIZED	IP	IRON PIPE	OC	ON CENTER	ROW	RIGHT OF WAY	UT	UTILITY, UNDERGROUND TELEPHONE
CAD	COMPUTER-AIDED DESIGN	DIM	DIMENSION	GC	GENERAL CONTRACTOR	IPS	IRON PIPE SIZE	OCEW	ON CENTER EACH WAY	R/W	RIGHT OF WAY		
CB	CATCH BASIN	DS	DOWNSPOUT	GFE	GARAGE FLOOR ELEVATION	J-BOX	JUNCTION BOX	OH	OVERHEAD	SAN	SANITARY	VCP	VITRIFIED CLAY PIPE
CFS	CUBIC FEET PER SECOND	EA	EACH	GL	GUTTER LINE	JT	JOINT	OHD	OVERHEAD DOOR	SCH	SCHEDULE	W/O	WITHOUT
CF	CUBIC FOOT	ELEC	ELECTRICAL	GPM	GALLONS PER MINUTE	LF	LINEAR FEET	OZ	OUNCE	SF	SQUARE FOOT	W/	WITH
CI	CAST IRON	ELEV	ELEVATION	GV	GATE VALVE	LIN	LINEAR	PED	PEDESTAL, PEDESTRIAN	SPEC	SPECIFICATION	YD	YARD
CIP	CAST IRON PIPE	EOF	EMERGENCY OVERFLOW	HDPE	HIGH DENSITY POLYETHYLENE	LPS	LOW PRESSURE STEAM	PERF	PERFORATED	SQ	SQUARE	YR	YEAR
CIPC	CAST IN PLACE CONCRETE	EQ	EQUAL	HD	HEAVY DUTY	LS	LUMP SUM	PL	PROPERTY LINE	STA	STATION		
CJ	CONTROL JOINT	EX	EXISTING	HH	HANDHOLE	LSO	LOWEST STRUCTURAL OPENING	PP	POLYPROPYLENE	SY	SQUARE YARD		
CL	CENTERLINE	FDC	FIRE DEPARTMENT CONNECTION	HORIZ	HORIZONTAL	MAX	MAXIMUM	PSI	POUNDS PER SQUARE INCH	T/C	TOP OF CURB		

SHEET INDEX

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

PROJECT GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE CONTRACT DOCUMENTS, WHICH INCLUDE, BUT ARE NOT LIMITED TO, THE OWNER - CONTRACTOR AGREEMENT, THE PROJECT MANUAL (WHICH INCLUDES GENERAL SUPPLEMENTARY CONDITIONS AND SPECIFICATIONS), DRAWINGS OF ALL DISCIPLINES AND ALL ADDENDA, MODIFICATIONS AND CLARIFICATIONS ISSUED BY THE ARCHITECT/ENGINEER.
2. CONTRACT DOCUMENTS SHALL BE ISSUED TO ALL SUBCONTRACTORS BY THE GENERAL CONTRACTOR IN COMPLETE SETS IN ORDER TO ACHIEVE THE FULL EXTENT AND COMPLETE COORDINATION OF ALL WORK.
3. WRITTEN DIMENSIONS TAKE PRECEDENCE OVER SCALED DIMENSIONS. NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES OR CONDITIONS REQUIRING INFORMATION OR CLARIFICATION BEFORE PROCEEDING WITH THE WORK.
4. FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS. NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES OR CONDITIONS REQUIRING INFORMATION OR CLARIFICATION BEFORE PROCEEDING WITH THE WORK.
5. DETAILS SHOWN ARE INTENDED TO BE INDICATIVE OF THE PROFILES AND TYPE OF DETAILING REQUIRED THROUGHOUT THE WORK. DETAILS NOT SHOWN ARE SIMILAR IN CHARACTER TO DETAILS SHOWN. WHERE SPECIFIC DIMENSIONS, DETAILS OR DESIGN INTENT CANNOT BE DETERMINED, NOTIFY ARCHITECT/ENGINEER BEFORE PROCEEDING WITH THE WORK.
6. ALL MANUFACTURED ARTICLES, MATERIALS AND EQUIPMENT SHALL BE APPLIED, INSTALLED, CONNECTED, ERECTED, CLEANED AND CONDITIONED ACCORDING TO MANUFACTURERS' INSTRUCTIONS. IN CASE OF DISCREPANCIES BETWEEN MANUFACTURERS' INSTRUCTIONS AND THE CONTRACT DOCUMENTS, NOTIFY ARCHITECT/ENGINEER BEFORE PROCEEDING WITH THE WORK.
7. ALL DISSIMILAR METALS SHALL BE EFFECTIVELY ISOLATED FROM EACH OTHER TO AVOID GALVANIC CORROSION.
8. THE LOCATION AND TYPE OF ALL INPLACE UTILITIES SHOWN ON THE PLANS ARE FOR GENERAL INFORMATION ONLY AND ARE ACCURATE AND COMPLETE TO THE BEST OF THE KNOWLEDGE OF I & S GROUP, INC. (ISG). NO WARRANTY OR GUARANTEE IS IMPLIED. THE CONTRACTOR SHALL VERIFY THE SIZES, LOCATIONS AND ELEVATIONS OF ALL INPLACE UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL IMMEDIATELY NOTIFY ENGINEER OF ANY DISCREPANCIES OR VARIATIONS FROM PLAN.
9. THE CONTRACTOR IS TO CONTACT "GOPHER STATE ONE CALL" FOR UTILITY LOCATIONS, MINIMUM 2 BUSINESS DAYS PRIOR TO ANY EXCAVATION / CONSTRUCTION (1-800-252-1166).

PROJECT INDEX:

OWNER:

LENNAR
16305 36TH AVENUE NORTH
PLYMOUTH, MN 55446

PROJECT ADDRESS / LOCATION:

SECTION 27 / TWP. 116 / RGE. 23

CARVER COUNTY MN

CHASKA, MINNESOTA

MANAGING OFFICE:

BLOOMINGTON OFFICE
7900 INTERNATIONAL DRIVE
SUITE 550
MINNEAPOLIS, MN 55425
PHONE: 952.426.0699

PROJECT MANAGER: JERREMY FOSS
EMAIL: JERREMY.FOSS@ISGINC.COM

SPECIFICATIONS REFERENCE

ALL CONSTRUCTION SHALL COMPLY WITH THE CITY OF CHASKA REQUIREMENTS AND MnDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION, 2018 EDITION, AND THE STANDARD SPECIFICATIONS FOR SANITARY SEWER, STORM DRAIN AND WATERMAIN AS PROPOSED BY THE CITY ENGINEERS ASSOCIATION OF MINNESOTA 2013, UNLESS DIRECTED OTHERWISE.

PROJECT DATUM

HORIZONTAL COORDINATES HAVE BEEN REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83), 1996 ADJUSTMENT (NAD83(1996)) ON THE CARVER COUNTY COORDINATE SYSTEM, IN U.S. SURVEY FEET.
ELEVATIONS HAVE BEEN REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
RTK GPS METHODS WERE USED TO ESTABLISH HORIZONTAL AND VERTICAL COORDINATES FOR THIS PROJECT.

B.M. ELEVATION=954.44
TNFH SE INTERSECTION AUTUMN WOODS DR AND AUDUBON ROAD

B.M. ELEVATION=940.33
WEST SIDE AUDUBON ROAD, APPROX. 500' NORTH INTERSCTION WITH BUTTERNUT DRIVE

TOPOGRAPHIC SURVEY

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

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

PROJECT

LENNAR

RESERVE AT AUTUMN WOODS

CHASKA **MINNESOTA**

REVISION SCHEDULE

DATE	DESCRIPTION	BY

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

TITLE

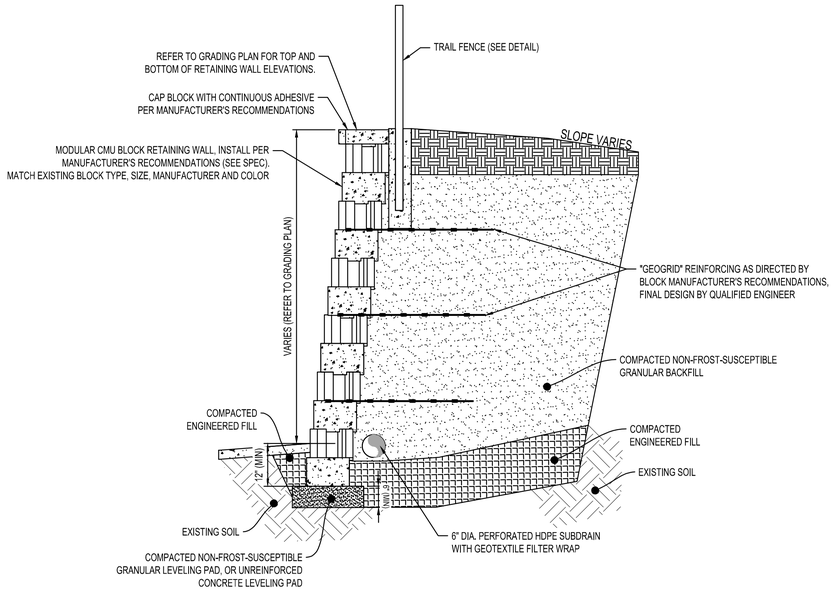
TITLE SHEET GENERAL INFORMATION

SHEET

1

OF 47

PLOT DATE: 9/30/2021 5:33 PM



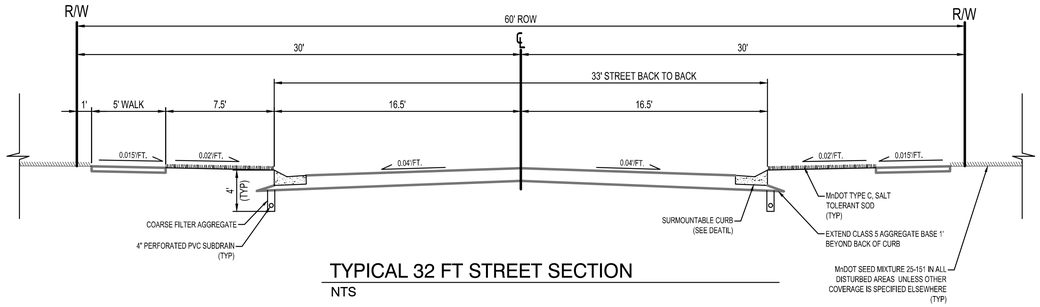
CONSTRUCTION NOTES:

A. SPECIFICATIONS
1. SEGMENTAL RETAINING WALL UNITS SHALL BE FURNISHED AND CONSTRUCTED IN ACCORDANCE WITH THE BUILDING CODE REQUIREMENTS AND MANUFACTURER'S RECOMMENDATIONS.
   a. MODULAR CONCRETE UNITS SHALL MEET THE REQUIREMENTS OF ASTM C1372, ASTM C90, ASTM C145, WITH 28-DAY STRENGTH OF 3,000 PSI AND LESS THAN 8% MOISTURE ABSORPTION.
   b. LEVELING PAD AGGREGATE BASE SHALL BE CRUSHED STONE OR CONCRETE, OR GRANULAR FILL WITH A GRADATION OF 100% PASSING 1 INCH, 35%-70% PASSING #4, 10%-35% PASSING #40, AND 3%-10% PASSING #200.
   c. NON-FROST-SUSCEPTIBLE GRANULAR BACKFILL SHALL BE CRUSHED STONE OR CONCRETE, OR GRANULAR FILL WITH A GRADATION OF 100% PASSING 1 INCH, 75%-100% PASSING 3/4", <60% PASSING #4, <35% PASSING #40, AND <5% PASSING #200.
   d. ENGINEERED FILL SHALL BE SOILS WITH A PLASTICITY INDEX LESS THAN 6 PER ASTM D4318; UNSUITABLE SOILS INCLUDE ORGANIC AND UNIFIED SOIL CLASSIFICATION SYSTEM GROUPS OF SC, CL, ML, CH, OH, MH, OL, OR PT.
2. CONCRETE SHALL BE NORMAL WEIGHT, UNO, AND MEET THE FOLLOWING CRITERIA.
   a. f'c = 3,000 psi
   b. 6% +/- 1.5% AIR ENTRAINMENT
   c. 0.55 MAXIMUM WATER-TO-CEMENT RATIO
   d. CEMENT SHALL CONFORM TO ASTM C150, TYPE I/II
   e. READY-MIX CONCRETE SHALL BE MIXED AND DELIVERED ACCORDANCE WITH ASTM C94.
3. FOUNDATION NET ALLOWABLE SOIL BEARING PRESSURE IS 1,500 PSF (PRESUMED), AND SHALL BE VERIFIED IN FIELD BY GEOTECHNICAL ENGINEER.
   a. THE DESIGN FROST PENETRATION DEPTH FOR UNHEATED STRUCTURES IS 60 INCHES; PROTECT FOUNDATION EXCAVATIONS FROM FROST; DO NOT PLACE CONCRETE ON FROZEN GROUND.
   b. FOUNDATION EXCAVATIONS SHALL BE KEPT FREE OF LOOSE MATERIAL, STANDING WATER, AND SHALL BE INSPECTED BEFORE THE PLACEMENT OF ANY CONCRETE.

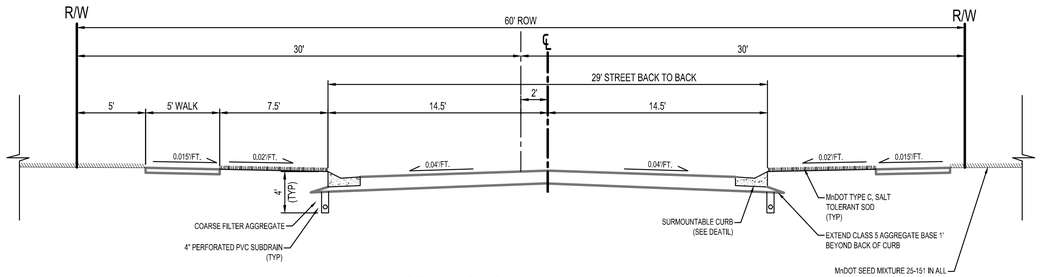
B. SUBMITTALS:
1. PRIOR TO SUBMITTAL, THE CONTRACTOR SHALL REVIEW THE SHOP DRAWINGS AND MAKE ANY CORRECTIONS REQUIRED. THE CONTRACTOR SHALL STAMP AND SIGN THE SHOP DRAWINGS PRIOR TO SUBMITTAL TO THE ENGINEER.
2. THE CONTRACTOR SHALL SUBMIT PRODUCT DATA FOR PROPRIETARY MATERIAL AND ITEMS, INCLUDING FORMING ACCESSORIES, ADMIXTURES, PATCHING COMPOUNDS, SEALANTS, WATERSTOPS, JOINT SYSTEMS, CURING COMPOUNDS, AND OTHERS IN AND FOR CONSTRUCTION.
3. THE FABRICATOR SHALL CLEARLY HIGHLIGHT/CLOUD ANY CHANGES MADE IN THE SHOP DRAWINGS WHICH DO NOT COMPLY WITH DESIGN DRAWINGS, ANY CHANGES MUST BE APPROVED BY THE ENGINEER PRIOR TO FABRICATION.
4. CONTRACTOR TO SUBMIT THE FOLLOWING DRAWINGS TO ENGINEER FOR REVIEW PRIOR TO CONSTRUCTION OF SIGN.
   a. CONCRETE MIX DESIGNS
   b. MODULAR CONCRETE RETAINING WALL
   c. ADDITIONAL SHOP DRAWINGS REQUESTED IN THE SPECIFICATIONS.
5. A COPY OF ALL SHOP DRAWINGS SHALL BE MAINTAINED ON SITE AT ALL TIMES.

C. QUALITY CONTROL AND QUALITY ASSURANCE:
1. COORDINATE FOR ENGINEER OR OWNER'S INDEPENDENT TESTING AGENCY TO INSPECT AND APPROVE REINFORCING STEEL AND EMBEDS PRIOR TO ORDERING CONCRETE.
2. COORDINATE FOR OWNER'S INDEPENDENT TESTING AGENCY TO BE ON SITE AND PERFORM CONTINUOUS INSPECTION WHILE CONCRETE PLACEMENT IS OCCURING. PROVIDE NOTICE NO LESS THAN 48 HOURS IN ADVANCE OF CONRETE PLACEMENT.
3. COORINDATE WITH OWNER'S INDEPENDENT TESTING AGENCY TO SAMPLE CONCRETE AT TIME OF PLACEMENT IN ORDER TO PERFORM SLUMP, AIR, TEMPERATURE AND CASTING OF CYLINDERS.
4. THE SPECIAL INSPECTOR SHALL DETERMINE COMPLIANCE WITH THE SOIL REPORT FOR SITE PREPARATION, FILL PLACEMENT AND DENSITY TESTS.
5. ANY AND ALL WORK PERFORMED WITHOUT PROPER INSPECTION AND TESTING AS OUTLINED IN THIS SPECIFICATION WILL BE CONSIDERED UNAUTHORIZED WORK. ANY CORRECTIVE MEASURES REQUIRED OF THE UNAUTHORIZED WORK WILL BE AT CONTRACTORS OWN EXPENSE

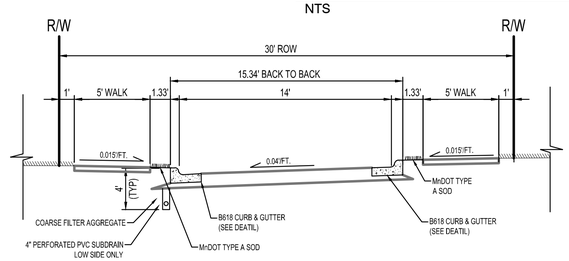
MODULAR BLOCK RETAINING WALL DETAIL
NTS



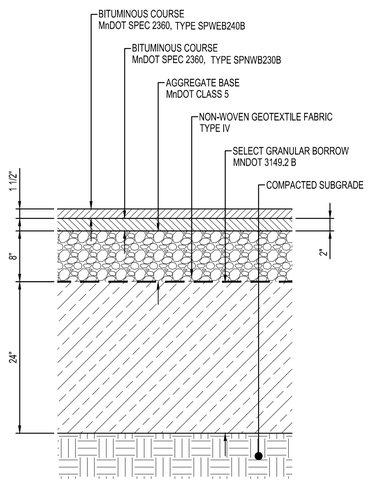
TYPICAL 32 FT STREET SECTION
NTS



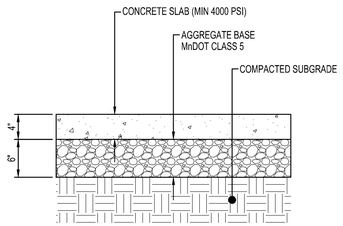
STA: 1+39 TO 6+67
TYPICAL 28 FT STREET SECTION
NTS



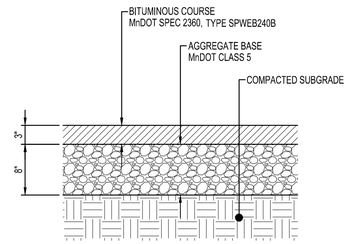
TYPICAL 14 FT RIGHT OUT STREET SECTION
NTS



BITUMINOUS PAVEMENT
NTS ST117



CONCRETE SIDEWALK
NTS ST165



BITUMINOUS TRAIL
NTS

PRELIMINARY NOT FOR CONSTRUCTION

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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

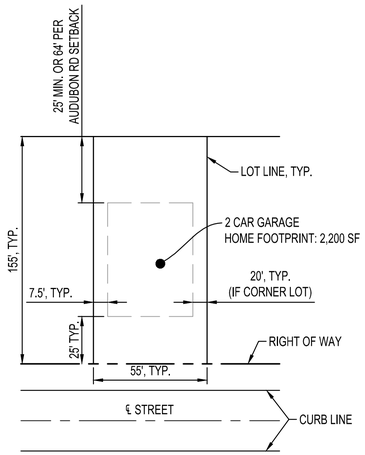
TYPICAL STREET SECTION AND DETAILS

SHEET

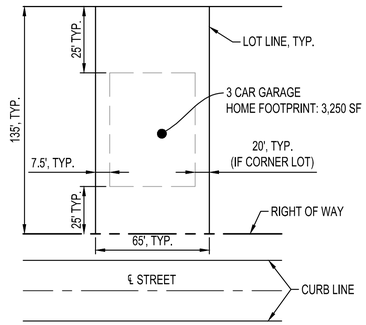
2

OF 47

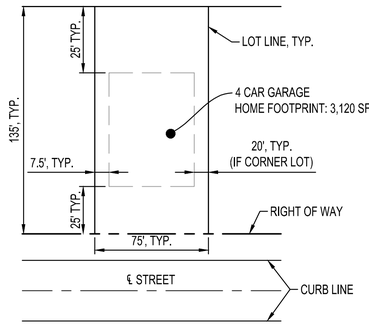
PLOT DATE: 9/30/2021 12:39 PM



55' SINGLE FAMILY
TYPICAL LOT LAYOUT
NTS



65' SINGLE FAMILY
TYPICAL LOT LAYOUT
NTS



75' SINGLE FAMILY
TYPICAL LOT LAYOUT
NTS

PRELIMINARY NOT FOR CONSTRUCTION

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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

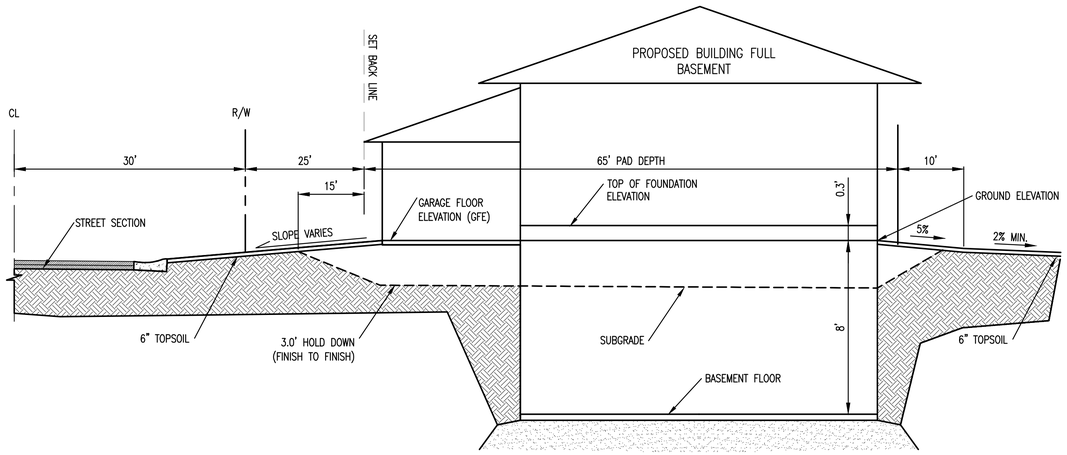
SITE DETAILS

SHEET

3

OF 47

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



SINGLE FAMILY FULL BASEMENT (FB)
3.0' HOLD DOWN

N.T.S.

NOTE:

FB = FULL BASEMENT

LO = LOOK OUT BASEMENT

WO = WALKOUT BASEMENT

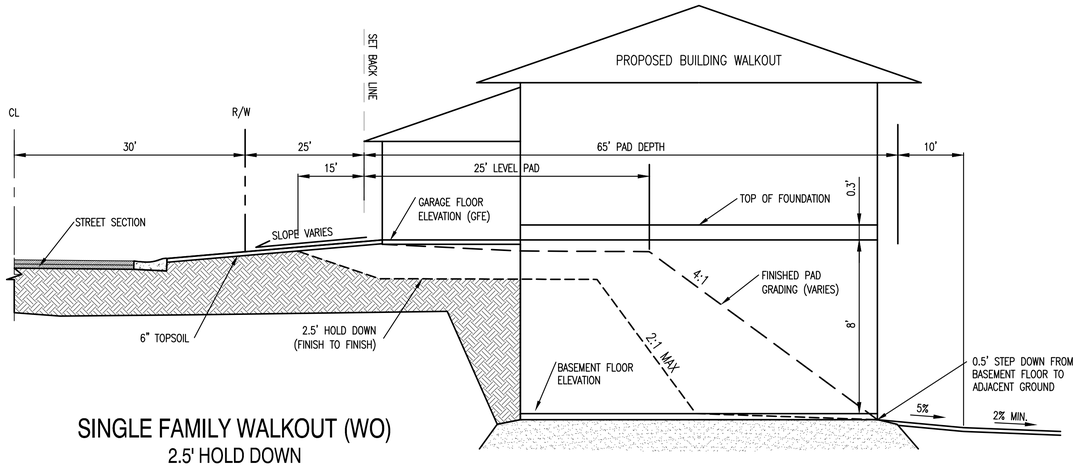
SELO = SPLIT ENTRY LOOKOUT BASEMENT

SEWO = SPLIT ENTRY WALKOUT BASEMENT

SOG = SLAB ON GRADE

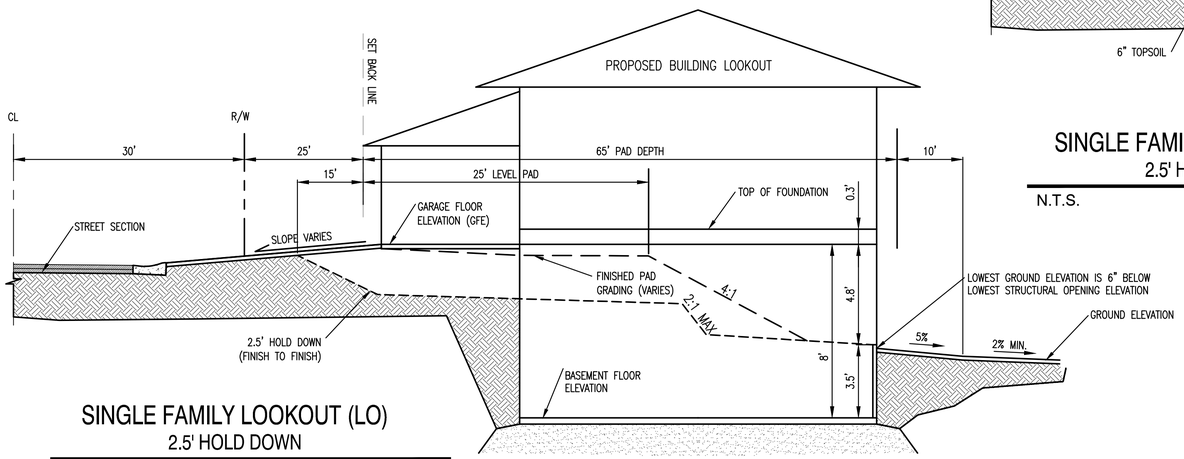
THE FIRST ELEVATION LISTED REFERS TO THE GARAGE FLOOR ELEVATION (GFE). THE SECOND ELEVATION LISTED REFERS TO THE LOWEST STRUCTURAL OPENING (LSO). IF NO SECOND ELEVATION IS LISTED THEN THE PRIMARY ELEVATION IS THE LOWEST STRUCTURAL OPENING.

SEE DETAILS OF EACH TYPE.



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.

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

PRELIMINARY NOT FOR CONSTRUCTION

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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.	-

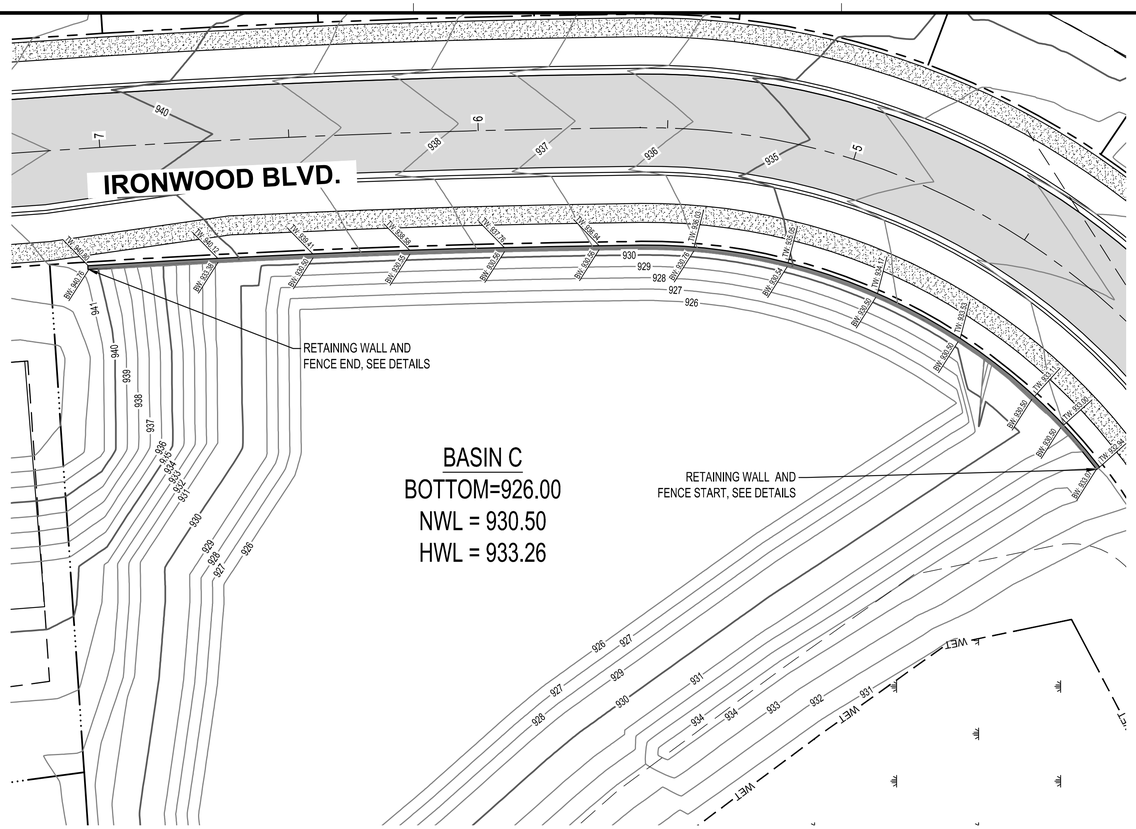
TITLE

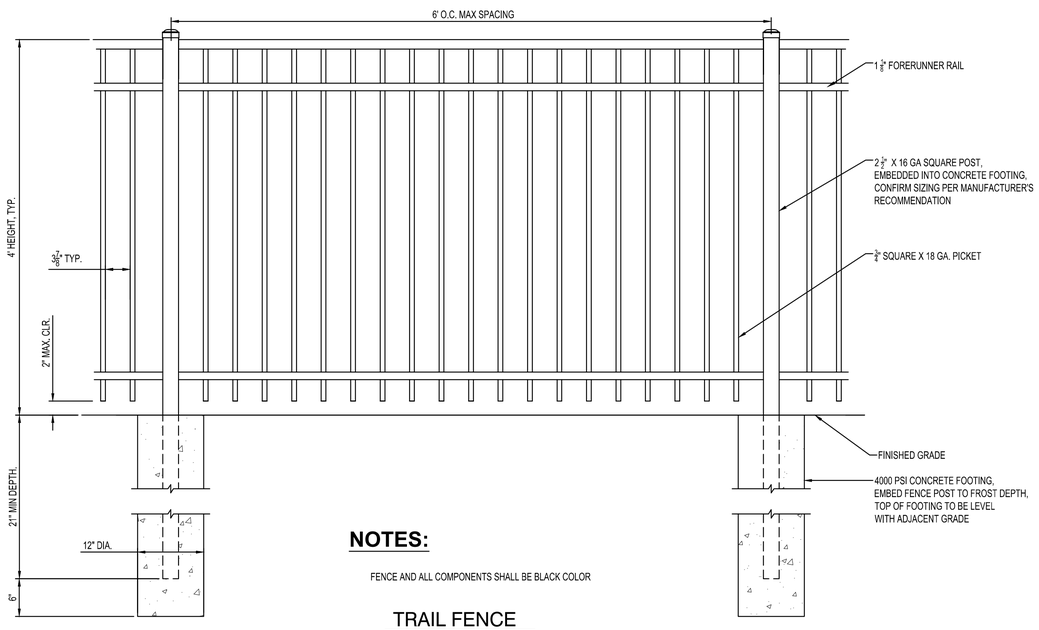
SITE DETAILS

SHEET

4

OF 47

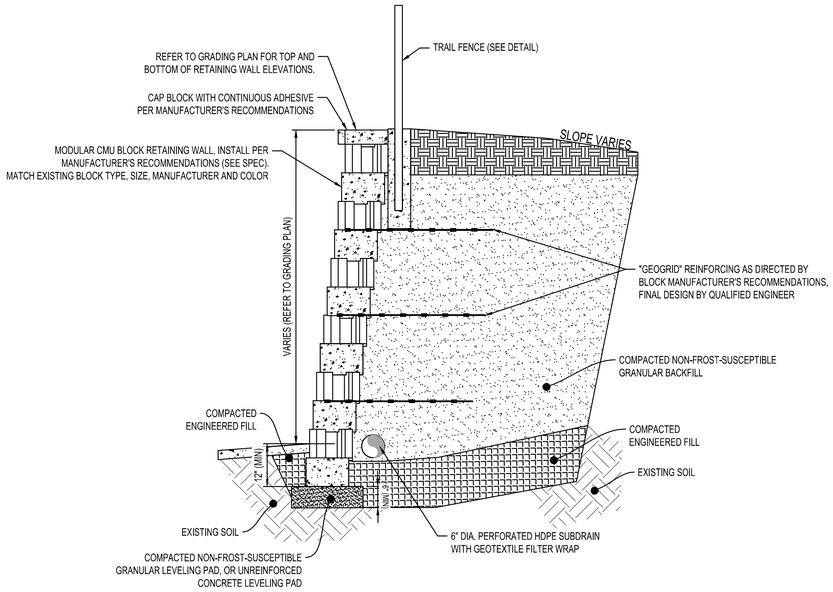




NOTES:

FENCE AND ALL COMPONENTS SHALL BE BLACK COLOR

TRAIL FENCE
NTS



CONSTRUCTION NOTES:

A. SPECIFICATIONS
1. SEGMENTAL RETAINING WALL UNITS SHALL BE FURNISHED AND CONSTRUCTED IN ACCORDANCE WITH THE BUILDING CODE REQUIREMENTS AND MANUFACTURER'S RECOMMENDATIONS.
   a. MODULAR CONCRETE UNITS SHALL MEET THE REQUIREMENTS OF ASTM C1372, ASTM C90, ASTM C145, WITH 28-DAY STRENGTH OF 3,000 PSI AND LESS THAN 8% MOISTURE ABSORPTION.
   b. LEVELING PAD AGGREGATE BASE SHALL BE CRUSHED STONE OR CONCRETE, OR GRANULAR FILL WITH A GRADATION OF 100% PASSING 1 INCH, 35%-70% PASSING #4, 10%-35% PASSING #40, AND 3%-10% PASSING #200.
   c. NON-FROST-SUSCEPTIBLE GRANULAR BACKFILL SHALL BE CRUSHED STONE OR CONCRETE, OR GRANULAR FILL WITH A GRADATION OF 100% PASSING 1 INCH, 75%-100% PASSING 3/4", <60% PASSING #4, <35% PASSING #40, AND <5% PASSING #200.
   d. ENGINEERED FILL SHALL BE SOILS WITH A PLASTICITY INDEX LESS THAN 6 PER ASTM D4318; UNSUITABLE SOILS INCLUDE ORGANIC AND UNIFIED SOIL CLASSIFICATION SYSTEM GROUPS OF SC, CL, ML, CH, OH, MH, OL, OR PT.
2. CONCRETE SHALL BE NORMAL WEIGHT, UNO, AND MEET THE FOLLOWING CRITERIA.
   a. f'c = 3,000 psi
   b. 6% +/- 1.5% AIR ENTRAINMENT
   c. 0.55 MAXIMUM WATER-TO-CEMENT RATIO
   d. CEMENT SHALL CONFORM TO ASTM C150, TYPE I/II
   e. READY-MIX CONCRETE SHALL BE MIXED AND DELIVERED ACCORDANCE WITH ASTM C94.
3. FOUNDATION NET ALLOWABLE SOIL BEARING PRESSURE IS 1,500 PSF (PRESUMED), AND SHALL BE VERIFIED IN FIELD BY GEOTECHNICAL ENGINEER.
   a. THE DESIGN FROST PENETRATION DEPTH FOR UNHEATED STRUCTURES IS 60 INCHES; PROTECT FOUNDATION EXCAVATIONS FROM FROST; DO NOT PLACE CONCRETE ON FROZEN GROUND.
   b. FOUNDATION EXCAVATIONS SHALL BE KEPT FREE OF LOOSE MATERIAL, STANDING WATER, AND SHALL BE INSPECTED BEFORE THE PLACEMENT OF ANY CONCRETE.

B. SUBMITTALS:
1. PRIOR TO SUBMITTAL, THE CONTRACTOR SHALL REVIEW THE SHOP DRAWINGS AND MAKE ANY CORRECTIONS REQUIRED. THE CONTRACTOR SHALL STAMP AND SIGN THE SHOP DRAWINGS PRIOR TO SUBMITTAL TO THE ENGINEER.
2. THE CONTRACTOR SHALL SUBMIT PRODUCT DATA FOR PROPRIETARY MATERIAL AND ITEMS, INCLUDING FORMING ACCESSORIES, ADMIXTURES, PATCHING COMPOUNDS, SEALANTS, WATERSTOPS, JOINT SYSTEMS, CURING COMPOUNDS, AND OTHERS IN AND FOR CONSTRUCTION.
3. THE FABRICATOR SHALL CLEARLY HIGHLIGHT/CLOUD ANY CHANGES MADE IN THE SHOP DRAWINGS WHICH DO NOT COMPLY WITH DESIGN DRAWINGS, ANY CHANGES MUST BE APPROVED BY THE ENGINEER PRIOR TO FABRICATION.
4. CONTRACTOR TO SUBMIT THE FOLLOWING DRAWINGS TO ENGINEER FOR REVIEW PRIOR TO CONSTRUCTION OF SIGN.
   a. CONCRETE MIX DESIGNS
   b. MODULAR CONCRETE RETAINING WALL
   c. ADDITIONAL SHOP DRAWINGS REQUESTED IN THE SPECIFICATIONS.
5. A COPY OF ALL SHOP DRAWINGS SHALL BE MAINTAINED ON SITE AT ALL TIMES.

C. QUALITY CONTROL AND QUALITY ASSURANCE:
1. COORDINATE FOR ENGINEER OR OWNER'S INDEPENDENT TESTING AGENCY TO INSPECT AND APPROVE REINFORCING STEEL AND EMBEDS PRIOR TO ORDERING CONCRETE.
2. COORDINATE FOR OWNER'S INDEPENDENT TESTING AGENCY TO BE ON SITE AND PERFORM CONTINUOUS INSPECTION WHILE CONCRETE PLACEMENT IS OCCURING. PROVIDE NOTICE NO LESS THAN 48 HOURS IN ADVANCE OF CONRETE PLACEMENT.
3. COORINDATE WITH OWNER'S INDEPENDENT TESTING AGENCY TO SAMPLE CONCRETE AT TIME OF PLACEMENT IN ORDER TO PERFORM SLUMP, AIR, TEMPERATURE AND CASTING OF CYLINDERS.
4. THE SPECIAL INSPECTOR SHALL DETERMINE COMPLIANCE WITH THE SOIL REPORT FOR SITE PREPARATION, FILL PLACEMENT AND DENSITY TESTS.
5. ANY AND ALL WORK PERFORMED WITHOUT PROPER INSPECTION AND TESTING AS OUTLINED IN THIS SPECIFICATION WILL BE CONSIDERED UNAUTHORIZED WORK. ANY CORRECTIVE MEASURES REQUIRED OF THE UNAUTHORIZED WORK WILL BE AT CONTRACTORS OWN EXPENSE

MODULAR BLOCK RETAINING WALL DETAIL
NTS

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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

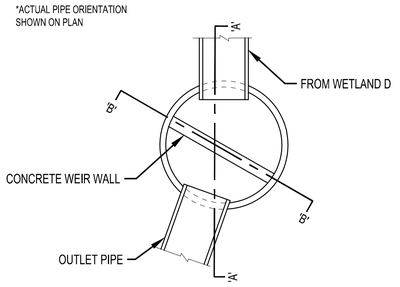
SHEET

5

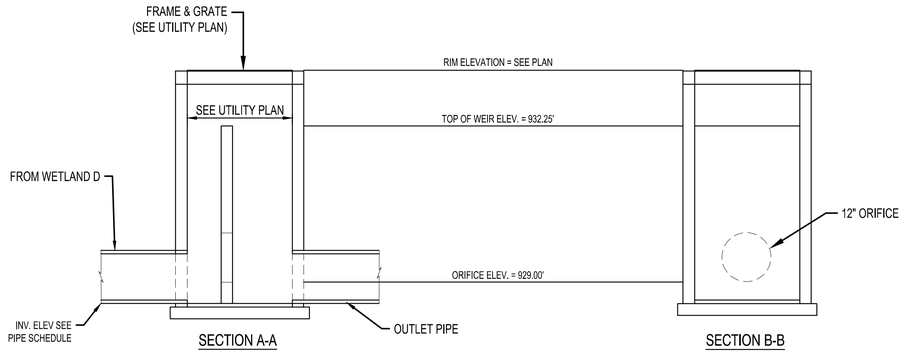
OF 47

PRELIMINARY NOT FOR CONSTRUCTION

PLOT DATE: 8/7/2021 7:14 AM



PLAN



SECTION A-A SECTION B-B

WETLAND D OUTLET STRUCTURE

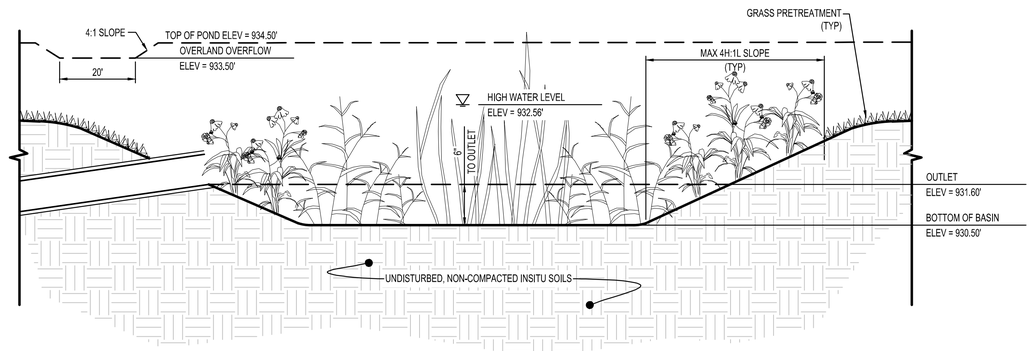
NTS SD700

INFILTRATION BASIN CONSTRUCTION:

A. Work Shall Include - All excavation and construction as outlined in the plans, specifications and details outlining the construction of the infiltration basin.
B. 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.
C. 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.
D. 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.
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 retilling of the basin.
F. 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.
G. 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

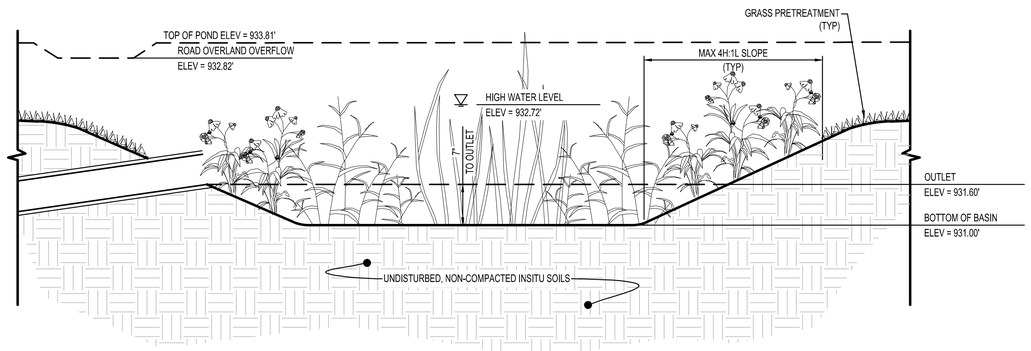
NTS SD800

INFILTRATION BASIN CONSTRUCTION:

A. Work Shall Include - All excavation and construction as outlined in the plans, specifications and details outlining the construction of the infiltration basin.
B. 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.
C. 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.
D. 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.
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 retilling of the basin.
F. 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.
G. 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 B INFILTRATION BASIN

NTS SD800

PLOT DATE: 9/30/2021 12:38 PM

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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.	-

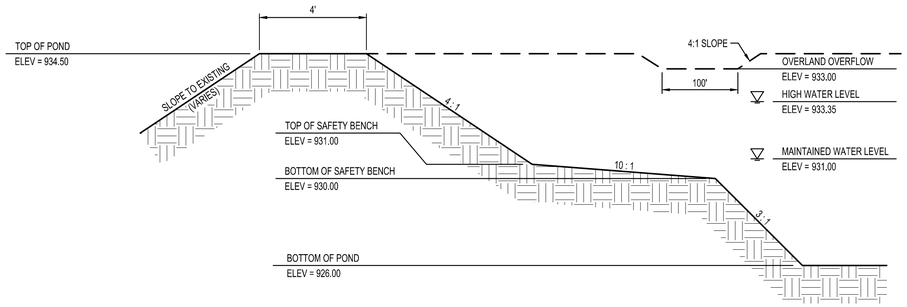
TITLE

STORM WATER BASIN DETAILS

SHEET

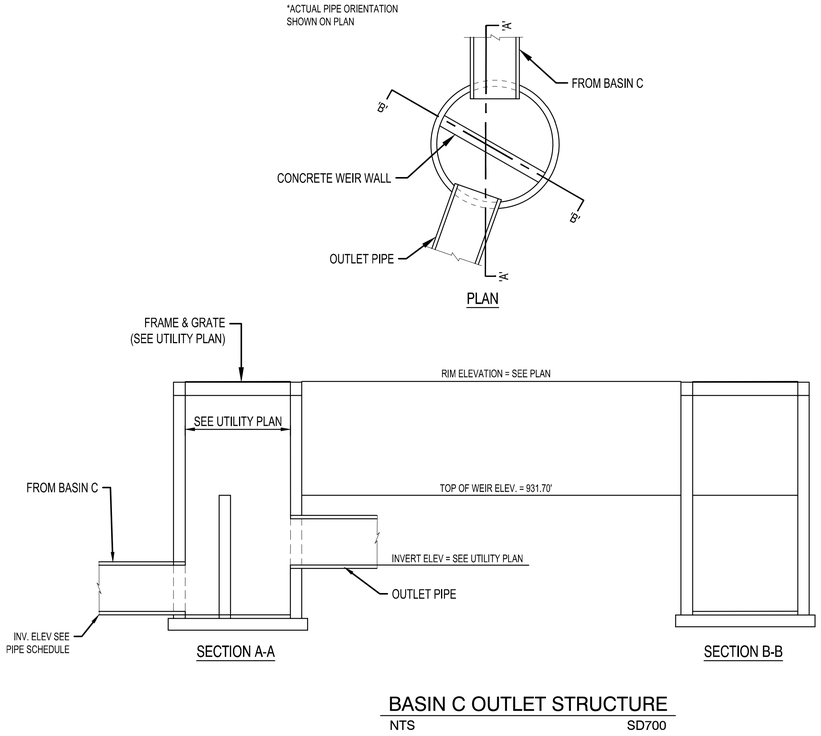
6 OF 47

PRELIMINARY NOT FOR CONSTRUCTION



BASIN C CROSS SECTION

NTS SD726



BASIN C OUTLET STRUCTURE

NTS SD700

BIOFILTRATION BASIN CONSTRUCTION:

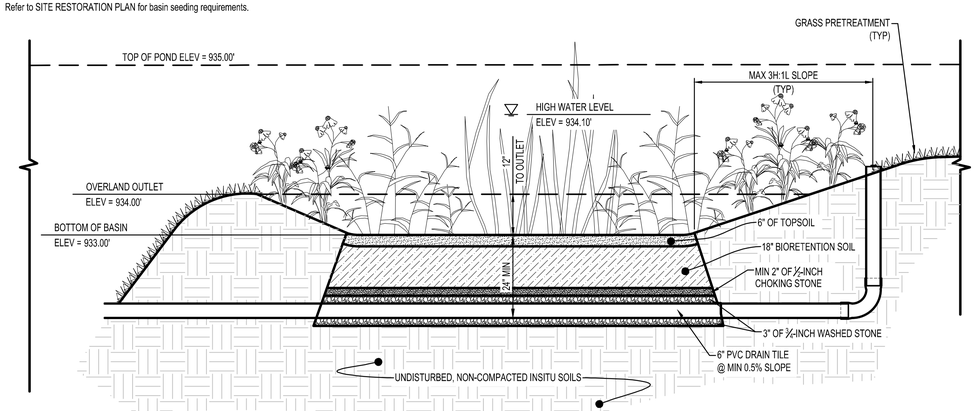
A. Work Shall Include - All excavation and construction as outlined in the plans, specifications and details outlining the construction of the filtration basin.
B. The Contractor shall maintain silt fence around the perimeter of the filtration basin during all phases of construction. The filtration area 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 retilling 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

PLOT DATE: 9/30/2021 12:38 PM

PRELIMINARY NOT FOR CONSTRUCTION

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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

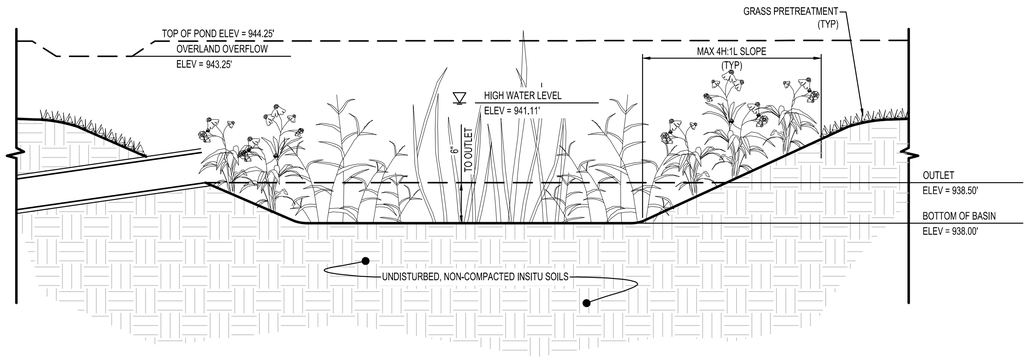
7 OF 47

INFILTRATION BASIN CONSTRUCTION:

A. Work Shall Include - All excavation and construction as outlined in the plans, specifications and details outlining the construction of the infiltration basin.
B. 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.
C. 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.
D. 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.
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 retilling of the basin.
F. 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.
G. 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 E INFILTRATION BASIN

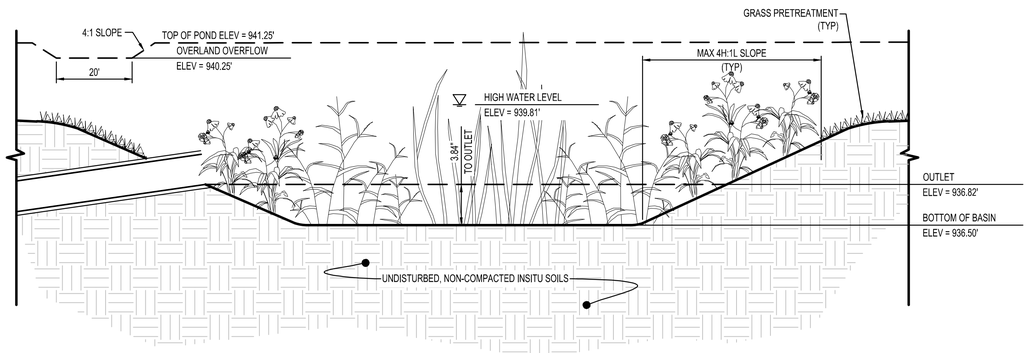
NTS SD800

INFILTRATION BASIN CONSTRUCTION:

A. Work Shall Include - All excavation and construction as outlined in the plans, specifications and details outlining the construction of the infiltration basin.
B. 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.
C. 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.
D. 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.
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 retilling of the basin.
F. 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.
G. 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:

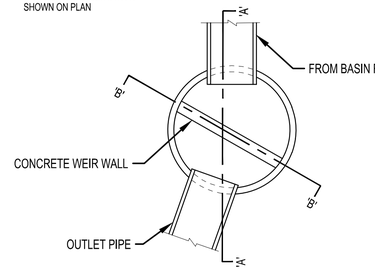
Refer to SITE RESTORATION PLAN for basin seeding requirements.



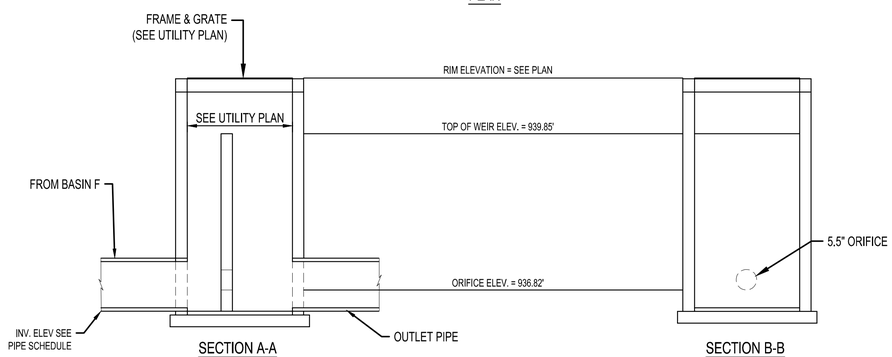
BASIN F INFILTRATION BASIN

NTS SD800

*ACTUAL PIPE ORIENTATION
SHOWN ON PLAN



PLAN



BASIN F OUTLET STRUCTURE

NTS SD700

PRELIMINARY NOT FOR CONSTRUCTION

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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

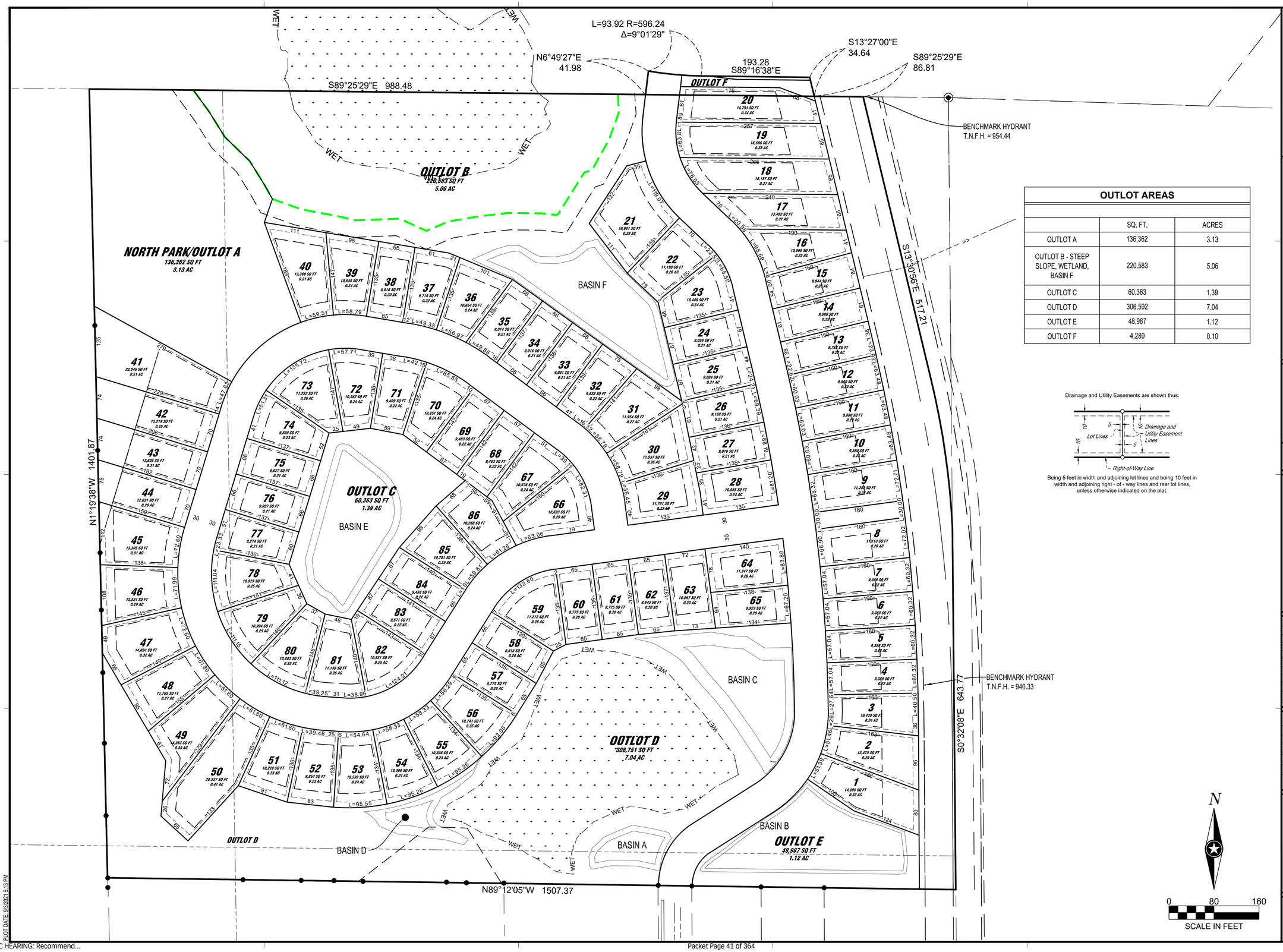
STORM WATER BASIN DETAILS

SHEET

8

OF 47

PLOT DATE: 9/30/2021 12:38 PM



OUTLOT AREAS		
	SQ. FT.	ACRES
OUTLOT A	136,362	3.13
OUTLOT B - STEEP SLOPE, WETLAND, BASIN F	220,583	5.06
OUTLOT C	60,363	1.39
OUTLOT D	306,592	7.04
OUTLOT E	48,987	1.12
OUTLOT F	4,289	0.10

Drainage and Utility Easements are shown thus:

Being 5 feet in width and adjoining lot lines and being 10 feet in width and adjoining right - of - way lines and rear lot lines, unless otherwise indicated on the plat.

N

0 80 160

SCALE IN FEET

ISG

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.

MARK A. SCHWANZ

DATE XX/XX/XXXX LIC. NO. 45817

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

PROJECT

LENNAR

RESERVE AT AUTUMN WOODS

CHASKA MINNESOTA

REVISION SCHEDULE		
DATE	DESCRIPTION	BY

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

TITLE

PRELIMINARY PLAT (OVERALL)

SHEET

9

OF 47

PRELIMINARY NOT FOR CONSTRUCTION

PLOT DATE: 8/3/2021 5:13 PM

STORMWATER POLLUTION PREVENTION PLAN (SWPPP) NARRATIVE

PROJECT LOCATION
PROJECT/SITE NAME: RESERVE AT AUTUMN WOODS
CITY/TOWNSHIP: CHASKA
COUNTY/STATE: HENNEPIN CO, MINNESOTA
ZIP CODE: 55318
LATITUDE/LONGITUDE: 44.832528, -93.575482
SECTION, TOWNSHIP, RANGE: S 27, T 116, R 23

PROJECT DESCRIPTION
THE PROJECT INCLUDES CONSTRUCTION OF A LARGE RESIDENTIAL DEVLEOPMENT WITH VARIOUS STYLE HOMES AND SUPPORTING ROADS, DRIVEWAYS, SIDEWALKS, AND UTILITIES. THERE WILL ALSO BE SIX STORMWATER BASINS CONSTRUCTED WITHIN THE DEVELOPMENT.

TENTATIVE CONSTRUCTION SCHEDULE (OPERATOR SHOULD PROVIDE ESTIMATED CONSTRUCTION SCHEDULE TO THE OWNER'S REPRESENTATIVE)

CONSTRUCTION ACTIVITIES:	ESTIMATED DATES OF SOIL DISTURBANCE ACTIVITIES:
CLEARING AND GRUBBING OPERATIONS, GRADING, POND	APRIL - AUGUST 2022
CURB & GUTTER/SIDEWALK	AUGUST – OCTOBER 2022
PAVING	SEPTEMBER – OCTOBER 2022
LANDSCAPING, FINAL TURF, MISC.	APRIL –AUGUST 2023

PRE-CONSTRUCTION IMPERVIOUS SURFACE AND DISTURBED AREA CALCULATIONS
TOTAL AREA TO BE DISTURBED = 34.23 ACRES MINIMUM AREA REQUIRING MPCA PERMIT = 1.00 ACRES
****AN MPCA NPDES PERMIT IS REQUIRED FOR THIS PROJECT****
IMPERVIOUS AREA: PRE-CONSTRUCTION = 0.63 ACRES
POST-CONSTRUCTION = 11.16 ACRES
NET INCREASE OF IMPERVIOUS AREA = 10.53 ACRES

MINIMUM NEW IMPERVIOUS SURFACE AREA CREATED REQUIRING PERMANENT STORMWATER MANAGEMENT = 5,000 SF (BASED ON WATERSHED REQUIREMENTS)

CONTACT INFORMATION/RESPONSIBLE PARTIES
THE OWNER OWNS THE LAND, ADJACENT ROADS, AND EASEMENT AREAS ASSOCIATED WITH THE PROJECT. THE OWNER IS THE OWNER CO-PERMITTEE APPLYING FOR PERMIT COVERAGE AND WILL BE RESPONSIBLE FOR COMPLIANCE WITH ALL TERMS AND CONDITIONS OF THE PERMIT INCLUDING DEVELOPING THIS SWPPP AND THE LONG-TERM MAINTENANCE PLAN OF THE PERMANENT STORMWATER MANAGEMENT SYSTEM FOR THIS PROJECT (IF APPLICABLE). THE OWNER WILL ENSURE THAT THE DESCRIBED WORK IN THE SWPPP IS BEING COMPLETED BY THE OPERATOR PERMITTEE.

OWNER/PERMITTEE: LENNAR (JOSH METZER, LAND ENTITLEMENT MANAGER)
10305 36TH AVE NORTH, SUITE 600
PLYMOUTH, MN 55446
952.249.3068/JOSH.METZER@LENNAR.COM

THE PRIMARY CONTRACTOR WILL ENTER INTO A CONTRACT WITH THE OWNER TO COMPLETE THE REQUIRED WORK FOR THIS PROJECT. THE PRIMARY CONTRACTOR WILL BECOME (UNDER CONTRACT) THE OPERATOR CO-PERMITTEE ON THE NPDES PERMIT (THROUGH EXECUTION OF A NPDES PERMIT MODIFICATION FORM), AND THEREBY AGREE TO IMPLEMENT THIS SWPPP IN COOPERATION WITH THE OWNER. THE OPERATOR IS RESPONSIBLE FOR IDENTIFYING AN EROSION CONTROL SUPERVISOR PRIOR TO STARTING CONSTRUCTION (REFER TO SWPPP AMENDMENT SECTION). THE NPDES PERMIT MODIFICATION FORM SHALL BE SUBMITTED TO THE MPCA AFTER THE PROJECT IS AWARDED TO THE OPERATION, PRIOR TO LETTING THE PROJECT.

THE OPERATOR WILL ENSURE THAT INDIVIDUALS OVERSEEING OR IMPLEMENTING THE SWPPP HAVE BEEN PROPERLY TRAINED AND THAT CERTIFICATIONS WILL BE MADE AVAILABLE UPON REQUEST. THIS INCLUDES ANY SUB-CONTRACTORS THAT THE OPERATOR EMPLOYS UNDER SEPARATE CONTRACT. THE OPERATOR WILL PROVIDE THE CONTACT INFORMATION FOR THE EROSION CONTROL SUPERVISOR, SITE SUPERINTENDENT/FOREMAN, AND BMP INSTALLERS. THE EROSION CONTROL SUPERVISOR SHALL BE A RESPONSIBLE EMPLOYEE OF THE PRIME CONTRACTOR AND/OR DULY AUTHORIZED BY THE PRIME CONTRACTOR TO REPRESENT THE PRIME CONTRACTOR ON ALL MATTERS PERTAINING TO THE NPDES CONSTRUCTION STORMWATER PERMIT COMPLIANCE. THE EROSION CONTROL SUPERVISOR SHALL HAVE AUTHORITY OVER ALL OPERATOR ACTIVITIES WHICH INFLUENCE NPDES PERMIT COMPLIANCE, INCLUDING GRADING, EXCAVATION, BRIDGE CONSTRUCTION, CULVERT INSTALLATION, UTILITY WORK, CLEARING/GRUBBING, DEWATERING, AND ANY OTHER OPERATION THAT INCREASES THE EROSION POTENTIAL ON THE PROJECT.

THE OPERATOR WILL PERFORM A PRECONSTRUCTION SITE VISIT TO ADDRESS ANY AREAS OF CONCERN PERTAINING TO ENVIRONMENTAL COMPLIANCE. THE OPERATOR WILL IMPLEMENT AND MAINTAIN BMPS FOR THE DURATION OF CONSTRUCTION PROJECT. THE OPERATOR WILL COMPLETE THE REQUIRED SITE INSPECTIONS, AND IS RESPONSIBLE FOR SECTION 3-4, 6-22, 24, AND APPLICABLE PARTS OF 23, TO REMAIN IN COMPLIANCE WITH NPDES PERMIT.

OPERATOR/PERMITTEE: (TO BE DETERMINED AND IDENTIFIED THROUGH TRANSFER OF NPDES-CSW PERMIT)

ISG INC. HAS BEEN CONTRACTED BY THE OWNER TO DEVELOP THE SWPPP PLAN FOR THIS PROJECT. THIS SWPPP WAS PREPARED BY AN INDIVIDUAL THAT HAS BEEN PROPERLY TRAINED IN ACCORDANCE TO SECTION 21 OF THE NPDES PERMIT (CERTIFICATION CARDS ARE AVAILABLE UPON REQUEST). ISG INC. WILL OFFER GUIDANCE FOR COMPLIANCE WITH THE NPDES PERMIT BEFORE, DURING, AND AFTER CONSTRUCTION OF THE PROJECT.

SWPPP DESIGNER:
ISG INC. (EMILY SHAW)
7900 INTERNATIONAL DR., SUITE 550
MINNEAPOLIS, MN 55425
952-426-0699/EMILY.SHAW@IS-GRP.COM

PERMENANT STORMWATER MANAGEMENT SYSTEM:
ISG INC. (EMILY SHAW)
7900 INTERNATIONAL DR., SUITE 550
MINNEAPOLIS, MN 55416
952-426-0699/EMILY.SHAW@IS-GRP.COM

AGENCY CONTACTS

AGENCY	PERMIT	NAME	PHONE NUMBER/E-MAIL
MPCA (EMERGENCY)	N/A	STATE DUTY OFFICER	1-800-422-0798
MPCA	NPDES-CSW #MNR100001	MATT KING	218-846-8103/MATTHEW.KING@STATE.MN.US
WATERSHED DISTRICT	STORMWATER MANAGEMENT	TERRY JEFFERY	952-807-6885/TJEFFERY@RPBCWD.ORG

PERMANENT STORMWATER TREATMENT SYSTEMS
THE NPDES PERMANENT WATER QUALITY VOLUME (SECTION 15) FROM THE NET NEW IMPERVIOUS SURFACES OF THE PROJECT IS PROVIDED IN THE PROPOSED INFILTRATION BASINS AND WET SEDIMENTATION BASIN. HYDROLOGIC AND WATER QUALITY MODELING DATA AND THE CONTAMINATION CHECKLIST IS AVAILABLE UPON REQUEST. THE SITE IS ABLE TO MEET THE FULL VOLUME REDUCTION REQUIREMENT. INFILTRATION RATES WERE DETERMINED BY THE FIELD MEASURED INFILTRATION RATE AND DIVIDED BY 2.

LOCATION OF SWPPP COMPONENTS

DESCRIPTION	TITLE	LOCATION (SHEET NAME)
SWPPP NARRATIVE	SWPPP NARRATIVE	SWPPP GENERAL INFORMATION, DETAILS AND NOTES
SITE CONDITIONS	SWPPP NARRATIVE	SWPPP GENERAL INFORMATION, DETAILS AND NOTES
SITE MAPS (SOILS, WATER RESOURCES, POTENTIAL POLLUTANT GENERATING ACTIVITIES)	SWPPP MAP, SWPPP NARRATIVE	STORMWATER POLLUTION PREVENTION PLAN (SWPPP)
CONSTRUCTION PHASING/STAGING, BUFFERS, & AREAS NOT TO BE DISTURBED	SWPPP NARRATIVE	SWPPP GENERAL INFORMATION, DETAILS AND NOTES
DIRECTION OF SURFACE WATER FLOW (PRE- & POST- CONSTRUCTION	DRAINAGE PLAN	STORMWATER POLLUTION PREVENTION PLAN (SWPPP)
IMPERVIOUS SURFACES	CONSTRUCTION PLAN & PROFILE	STORMWATER POLLUTION PREVENTION PLAN (SWPPP)
TEMPORARY EROSION & SEDIMENT CONTROL BMPS FOR STEEP SLOPES (3:1), DNR FISH EXCLUSION "WORK IN WATER RESTRICTIONS" REFER TO SWPPP	TEMPORARY EROSION AND SEDIMENT CONTROL PLAN, SWPPP NARRATIVE	SWPPP GENERAL INFORMATION, DETAILS AND NOTES
PERMANENT EROSION PREVENTION BMPS	TURF ESTABLISHMENT PLAN, SWPPP NARRATIVE	STORMWATER POLLUTION PREVENTION PLAN (SWPPP); SWPPP GENERAL INFORMATION, DETAILS AND NOTES; TURF RESTORATION PLAN
STORM SEWER	DRAINAGE PLAN	STORMWATER POLLUTION PREVENTION PLAN (SWPPP); OVERALL UTILITY PLAN
GRADING	GRADING PLAN	OVERALL GRADING PLAN, NOTES AND EARTHWORK CALCULATIONS
ESTIMATED BMP QUANTITIES	ESTIMATED QUANTITIES	STORMWATER POLLUTION PREVENTION PLAN (SWPPP)
BMP DETAILS/SPECIFICATIONS	MISC. DETAILS, SWPPP NARRATIVE	SWPPP GENERAL INFORMATION, DETAILS AND NOTES
HYDROLOGIC/WATER QUALITY MODELING		AVAILABLE UPON REQUEST

EXISTING SITE CONDITIONS, SOILS, & WATER RESOURCES
SOILS AND NATIVE TOPSOIL: NATIVE TOPSOIL WILL BE STRIPPED AND STOCKPILED FOR FINAL GRADING OPERATIONS, WHERE INDICATED IN THE CONSTRUCTION PLANS AND SPECIFICATIONS. METHODS AND EQUIPMENT TO MINIMIZE SOIL COMPACTION (IN PROPOSED INFILTRATION AREAS, DRIP LINE OF TREES TO BE PRESERVED, ETC.) SHALL BE DETERMINED BY THE OPERATORS SWPPP AMENDMENT. TRACKED VEHICLES ARE PREFERRED AND WHEELED VEHICLES ARE DISCOURAGED IN THESE AREAS. THE FOLLOWING USDA-NRCS MAPPED SOILS ARE SHOWN AS "NOT HIGHLY ERODIBLE", "MODERATELY ERODED", AND "ERODED" IN THE COUNTY SOIL SURVEY MAP.

USDA-NRCS MAPPED SOIL SURVEY UNIT NO., NAME, TEXTURE, SLOPE PERCENTAGE	PERCENTAGE OF PROJECT AREA	APPROXIMATE PARTICLE SIZE RANGE (MM) SAND (0.05-2.00+)	SILT (0.002-0.05)	CLAY (<0.002)
EX- ESSEXVILLE SANDY LOAM	2	50-70%	0-50%	15-20%
GL – GLENCOE CLAY LOAM, 0-1% SLOPES	16	26-52%	59-74%	26-41%
HM – HAMEL LOAM, 0-2% SLOPES	5	30-60%	74-92%	8-26%
KB – KILKENNY-LESTER LOAM, 2-6% SLOPES	40	30-60%	74-92%	8-26%
KB2 – LESTER-KILKENNY LOAM, 2-6% SLOPES, ERODED	16	30-60%	74-92%	8-26%
KC – LESTER-KILKENNY LOAMS, 6-12% SLOPES	1	30-60%	74-92%	8-26%
KC2 - LESTER-KILKENNY COMPLEX, 6-12% SLOPES, MODERATELY ERODED	16	NA	NA	NA
KF – LESTER-KILKENNY COMPLEX, 22-40% SLOPES	3	NA	NA	NA
MK – MUSKEGO HOUGHTON SOILS, 0-1% SLOPES	1	NA	NA	NA

DESCRIPTION OF RECEIVING WATERS (LOCATED WITHIN 1-MILE): STORMWATER FROM THIS PROJECT WILL BE CONVEYED INTO SEVERAL CONSTRUCTED STORMWATER PONDS. THE PROJECT HAS THREE SEPARATE DISCHARGE POINTS. ONE DISCHARGE POINT IS THROUGH THE SOUTHERN WETLAND. THE SECOND DISCHARGE POINT IS TO THE NORTH THROUGH THE NORTH WETLAND AND THEN INTO LAKE HAZELTINE. THE THIRD IS THE SMALLEST DISCHARGE AMOUNT AND GOES UNDER AUDUBON RD TO AN OFFSITE STORMWATER POND. HYDROLOGIC AND WATER QUALITY MODELING DATA IS AVAILABLE UPON REQUEST.

DESCRIPTION OF IMPAIRED WATERS OR WATER SUBJECT TO TMDLS: A SPECIAL AND IMPAIRED WATERS SEARCH WAS COMPLETED USING THE MPCA SEARCH ENGINE (HTTP://PCA-GIS02.PCA.STATE.MN.US/CSWINDEX.HTML) ON 7/6/2021. BASED ON THIS REVIEW, THE FOLLOWING SPECIAL OR IMPAIRED WATERS (WITH CONSTRUCTION RELATED IMPAIRMENTS) ARE LOCATED WITHIN ONE MILE OF, AND DOWNSTREAM OF ANY PROJECT DISCHARGE POINTS: HAZELTINE LAKE IS IMPAIRED (NUTRIENTS) AND BLUFF CREEK IS IMPAIRED (FISHES BIOASSESSMENTS, TURBIDITY), THEREFORE SECTION 23 REQUIREMENTS APPLY TO THIS PROJECT.

DISCHARGES TO SPECIAL (PROHIBITED, RESTRICTED, OTHER) OR IMPAIRED WATERS (SECTION 23)
ALL REQUIREMENTS IN SECTION 23 ARE IN ADDITION TO BMPS ALREADY SPECIFIED IN THE PERMIT. WHERE PROVISIONS OF SECTION 23 CONFLICT WITH REQUIREMENTS ELSEWHERE IN THE PERMIT, THE PROVISIONS IN SECTION 23 TAKE PRECEDENCE. ALL BMPS USED TO COMPLY WITH THESE ITEMS MUST BE DOCUMENTED IN THE SWPPP FOR THE PROJECT.

23.9 EXPOSED SOILS: OPERATOR SHALL STABILIZE ALL EXPOSED SOIL AREAS WITHIN (7) DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED.

23.10 TEMPORARY BASIN: OPERATOR SHALL ADHERE TO THE REQUIREMENTS DESCRIBED IN ITEM 14.1-14.10 OF THE NPDES CONSTRUCTION PERMIT FOR COMMON DRAINAGE LOCATIONS THAT SERVE AN AREA WITH FIVE (5) OR MORE ACRES DISTURBED.

23.11 BUFFER ZONE: AN UNDISTURBED BUFFER ZONE OF NOT LESS THAN 100 LINEAR FEET FROM THE SPECIAL WATER (NOT INCLUDING TRIBUTARIES) SHALL BE MAINTAINED AT ALL TIMES. EXCEPTIONS FROM THIS REQUIREMENT FOR AREAS, SUCH AS WATER CROSSINGS, LIMITED WATER ACCESS AND RESTORATION OF THE BUFFER ARE ALLOWED IF THE PERMITTEE FULLY DOCUMENTS IN THE SWPPP THE CIRCUMSTANCES AND REASONS THAT THE BUFFER ENCROACHMENT IS NECESSARY. REPLACEMENT OF EXISTING IMPERVIOUS SURFACE WITHIN THE BUFFER IS ALLOWED UNDER THIS PERMIT. ALL POTENTIAL WATER QUALITY, SCENIC AND OTHER ENVIRONMENTAL IMPACTS OF THESE EXCEPTIONS MUST BE MINIMIZED BY THE USE OF ADDITIONAL OR REDUNDANT BMPS AND DOCUMENTED IN THE SWPPP FOR THE PROJECT.

23.12 TEMPERATURE CONTROLS: THE PERMANENT STORMWATER MANAGEMENT SYSTEM MUST BE DESIGNED SUCH THAT THE DISCHARGE FROM THE PROJECT WILL MINIMIZE ANY INCREASE IN THE TEMPERATURE OF TROUT STREAM RECEIVING WATERS RESULTING FROM THE 1-AND 2-YEAR 24-HOUR PRECIPITATION EVENTS. THIS INCLUDES ALL TRIBUTARIES OF DESIGNATED TROUT STREAMS WITHIN THE PLSS SECTION THAT THE TROUT STREAM IS LOCATED. ALL STORMWATER ROUTED TO THE STORMWATER SYSTEM MUST DISCHARGE WITHIN 24 HOURS. PROJECTS THAT DISCHARGE TO TROUT STREAMS MUST MINIMIZE THE IMPACT USING ONE OR MORE OF THE FOLLOWING MEASURES, IN ORDER OF PREFERENCE:
A. PROVIDE STORMWATER INFILTRATION OR OTHER VOLUME REDUCTION PRACTICES AS DESCRIBED IN ITEM 15.4-15.5.
B. PROVIDE STORMWATER FILTRATION AS DESCRIBED IN ITEM 17.1-17.11.
C. MINIMIZE THE DISCHARGE FROM CONNECTED IMPERVIOUS SURFACES BY DISCHARGING TO VEGETATED AREAS, OR GRASS SWALES, AND THROUGH THE USE OF OTHER NON-STRUCTURAL CONTROLS.
D. IF A DRY POND IS USED, THE DESIGN MUST INCLUDE AN APPROPRIATE COMBINATION OR MEASURES SUCH AS SHADING, VEGETATED SWALE DISCHARGES OR CONSTRUCTD WETLAND TREATMENT CELLS THAT LIMIT TEMPERATURE INCREASES.
E. OTHER METHODS THAT MINIMIZE ANY INCREASE IN THE TEMPERATURE OF THE TROUT STREAM.

12.13 INSPECTIONS: PERMITTEES MUST CONDUCT ROUTINE SITE INSPECTIONS ONCE EVERY THREE (3) DAYS AS DESCRIBED IN ITEM 11.2.

23.14 TREATMENT: IF DISCHARGES TO PROHIBITED WATERS CANNOT PROVIDE VOLUME REDUCTION EQUAL TO ONE (1) INCH TIMES THE NET INCREASE OF IMPERVIOUS SURFACES AS REQUIRED IN ITEM 15.4 AND 15.5, PERMITTEES MUST DEVELOP A PERMANENT STORMWATER TREATMENT PLAN THAT WILL RESULT IN NO NET INCREASE OF TSS OR PHOSPHORUS TO THE PROHIBITED WATER. PERMITTEES MUST KEEP THE PLAN IN THE SWPPP FOR THE PROJECT.

POTENTIAL FOR SEDIMENT AND/OR OTHER POLLUTANT(S) DISCHARGING FROM THE PROJECT SITE
THE TEMPORARY EROSION AND SEDIMENT CONTROL BMPS IN THIS SWPPP HAVE BEEN DESIGNED TO MINIMIZE THE POTENTIAL OF SEDIMENTS DISCHARGING OFF-SITE FROM A 0.5 INCH RAINFALL WITHIN A 24 HOUR PERIOD. THE NOAA ATLAS 14 POINT PRECIPITATION FREQUENCY ESTIMATE FOR THE PROJECT LOCATION WAS REVIEWED AND USED FOR ANTICIPATED INSPECTION FREQUENCY, BMP DESIGN, AND ESTIMATING CONSTRUCTION ACTIVITIES IN THIS SWPPP. ATLAS 14 RESULTS DO NOT NECESSARILY REFLECT ANY DESIGN CRITERIA IN THE PERMANENT STORMWATER MANAGEMENT SYSTEM.

ROUTINE INSPECTION AND BMP MAINTENANCE BY THE OPERATOR IS CRUCIAL IN ENSURING THE FUNCTIONALITY OF EACH BMP. STEEP SLOPES AND OTHER ENVIRONMENTALLY SENSITIVE AREAS THAT ARE AT A HIGHER RISK OF SEDIMENTATION ARE DEFINED IN THIS SWPPP (IF APPLICABLE).

CONSTRUCTION PHASING/STAGING, BUFFERS, & AREAS NOT TO BE DISTURBED
THERE IS NO CONSTRUCTION PHASING OR STAGING DEFINED BY THE OWNER FOR THIS PROJECT. THE SCHEDULE FOR INSTALLING TEMPORARY BMPS SHALL BE INCORPORATED INTO THE OPERATOR'S WEEKLY SCHEDULE FOR EACH CONSTRUCTION STAGE AND PRESENTED TO THE OWNER'S REPRESENTATIVE (PER MNDOT SPEC 1717.D). THE PROJECT'S CONSTRUCTION PHASING AND STAGING IS DEFINED BY THE "CONSTRUCTION STAGING & TRAFFIC CONTROL PLAN" AND PROJECT SPECIFICATIONS.

ENVIRONMENTALLY SENSITIVE AREAS
STEEP SLOPES: EXISTING AND PROPOSED SLOPES 1 IN 3 (33.33%) AND STEEPER THAT ARE PROPOSED TO BE DISTURBED ARE ILLUSTRATED ON THE PLAN SHEETS. STEEP SLOPES MAY BE TEMPORARILY CREATED DURING GRADING OPERATIONS IF NECESSARY, AT WHICH TIME TEMPORARY BMPS MUST BE IMPLEMENTED BY THE OPERATOR (THROUGH AN APPROVED SWPPP AMENDMENT) WITHIN 7 DAYS OF NO LONGER WORKING THE STEEP SLOPE.

CONTAMINATED PROPERTIES: THE MPCA'S "WHAT'S IN MY NEIGHBORHOOD" DATABASE WAS REVIEWED ON 7/6/2021 (WWW.PCA.STATE.MN.US/DATA/WHATS-MY-NEIGHBORHOOD) AND A CONTAMINATION ASSESSMENT WAS PERFORMED (AVAILABLE UPON REQUEST). THE RESULTS OF THIS REVIEW SHOW NO KNOWN CONTAMINATED PROPERTIES OR LEAK SOURCES LOCATED WITHIN AND ADJACENT TO THE PROJECT LIMITS.

STORMWATER POLLUTION MITIGATION MEASURES (AS IDENTIFIED FROM ENVIRONMENTAL REVIEW): NO FORMAL ENVIRONMENTAL REVIEW WAS REQUIRED FOR THIS PROJECT, THEREFORE, NO ADDITIONAL STORMWATER RELATED MITIGATION MEASURES APPLY.

KARST AREAS: THERE ARE NO KNOWN ACTIVE KARST AREAS WITHIN OR ADJACENT TO THE PROJECT LIMITS.

SITE PLAN REQUIRED AREAS: NO AREAS OF "HIGH ENVIRONMENTAL RISKS" ARE KNOWN TO BE LOCATED WITHIN OR IMMEDIATELY ADJACENT TO THE PROJECT LIMITS.

FLOOD CONTINGENCY PLAN: PROJECT ACTIVITIES MAY NOT OCCUR WITHIN THE 100-YEAR FLOODPLAIN OR FLOODWAY, THEREFORE, THE PROJECT ENGINEER (AT THEIR DISCRETION) MAY REQUIRE A PREVENTATIVE FLOOD CONTINGENCY PLAN FOR SPECIFIC PROJECT ACTIVITIES AND AREAS IF SEASONAL PRECIPITATION POSSES A POTENTIAL RISK OF FLOODING WORK AREAS WITHIN THE PROJECT LIMITS. THIS PLAN SHALL BE SUBMITTED BY THE OPERATOR TO THE OWNERS REPRESENTATIVE FOR APPROVAL A MINIMUM OF 72 HOURS PRIOR TO THE SCHEDULED WORK AND/OR DURING ACTIVE WORK WITHIN THE FLOODPLAIN. NO WORK WITHIN THE FLOODPLAIN CAN COMMENCE UNTIL WRITTEN APPROVAL/NOTICE TO PROCEED FROM THE OWNERS REPRESENTATIVE IS RECEIVED.

FISH EXCLUSION DATES: FISH EXCLUSION DATES ARE NOT APPLICABLE TO THIS PROJECT LOCATION.

WETLANDS: THERE ARE SEVERAL WETLANDS WITHIN THE PROJECT AREA AND MUST BE PROTECTED TO THE MAXIMUM EXTENT POSSIBLE. APPROXIMATELY 1.03 ACRES OF WETLAND FILLED/EXCAVATION WILL BE PERMITTED. PERMITTED AREAS OF WETLAND IMPACT WILL BE PROTECTED WITH SILT FENCE ALONG THE PERIMETER OF THE FILL OR EXCAVATION LIMITS.

SEQUENCE OF CONSTRUCTION/TIMING OF BMP INSTALLATION
NO CONSTRUCTION OPERATIONS, INCLUDING REMOVALS, THAT REQUIRE EROSION & SEDIMENT CONTROL PER THE SWPPP CAN COMMENCE UNTIL THE OPERATOR'S EROSION CONTROL SUPERVISOR CERTIFIES THE PROPER INSTALLATION OF BMPS AND A CHAIN OF RESPONSIBILITY FOR SWPPP IMPLEMENTATION IS CREATED FOR ALL OPERATORS ON THE SITE. PERIMETER SEDIMENT CONTROLS (SILT FENCE, INLET PROTECTION, CONSTRUCTION ENTRANCES, ETC.) SHALL BE INSTALLED PRIOR TO THE START OF CONSTRUCTION. THESE PRACTICES SHALL REMAIN IN PLACE UNTIL FINAL STABILIZATION IS ACHIEVED. OPERATOR SHALL IMPLEMENT THE NECESSARY ON SITE BMP'S IN ACCORDANCE WITH THE NPDES PERMIT REQUIREMENTS TO PREVENT NUISANCE CONDITIONS (MN RULES 7050.2010) FROM ANY DISCHARGES UNDER COVERAGE OF THE NPDES PERMIT. IN SOME CASES, MULTIPLE OR REDUNDANT APPLICATIONS OF SOME BMP'S MAY BE NEEDED TO MEET THESE REQUIREMENTS.

INSPECTION PROCEDURES, SWPPP AMENDMENTS, RECORD KEEPING, & TRAINING
1. THE SWPPP MUST BE AMENDED BY THE OPERATOR WHEN THE IDENTITY OF THE RESPONSIBLE SITE OPERATORS (EROSION CONTROL SUPERVISOR, SUB-CONTRACTORS, ETC.) ARE KNOWN.
2. THE OPERATOR MUST INSPECT THE ENTIRE CONSTRUCTION SITE AT LEAST ONCE EVERY SEVEN (7) DAYS DURING ACTIVE CONSTRUCTION AND WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES IN 24 HOURS. THE OPERATOR SHALL PROVIDE A RAINFALL GAUGE ON-SITE, WITHIN ONE MILE OF THE SITE, OR SOURCE OF THE WEATHER REPORTING SYSTEM THAT USES SITE SPECIFIC RAINFALL DATA FROM RADAR SUMMARIES. THE LOCATION AND SOURCE OF THE RAINFALL GAUGE OR REPORTING SYSTEM MUST BE DOCUMENTED IN THE FIRST SWPPP INSPECTION REPORT. THE INSPECTION FREQUENCY MAY BE REDUCED TO ONCE PER MONTH OR SUSPENDED, IF SITE CONDITIONS MEET ITEM 11.10 OF THE NPDES PERMIT. ALL INSPECTIONS AND MAINTENANCE CONDUCTED MUST BE RECORDED IN WRITING BY THE OPERATOR AND RETAINED WITH THE SWPPP. THE MPCA SITE INSPECTION FORM IS AVAILABLE FOR OPERATORS TO USE TO COMPLETE THE REQUIRED INSPECTIONS. THE FORM CAN BE FOUND ON THE MPCA WEBSITE OR AVAILABLE UPON REQUEST FOR THE PROJECT OWNER. RECORDS OF EACH INSPECTION AND MAINTENANCE ACTIVITY SHALL INCLUDE:
A. DATE, TIME, AND NAME OF PERSON(S) CONDUCTING INSPECTIONS;
B. FINDINGS OF INSPECTIONS, INCLUDING RECOMMENDATIONS FOR CORRECTIVE ACTIONS;
C. CORRECTIVE ACTIONS TAKEN (INCLUDING DATES, TIMES, AND PARTY COMPLETING MAINTENANCE ACTIVITIES); INCLUDING DOCUMENTATION/PHOTOS OF IMPLEMENTED BMPS INTENDED TO CORRECT A PROBLEM BUT FAILED.
D. DATE AND AMOUNT OF ALL RAINFALL EVENTS GREATER THAN 0.5 INCHES IN 24 HOURS;
E. DOCUMENTATION OF CHANGES MADE TO THE SWPPP.
3. SWPPP AMENDMENTS AND SITE PLANS WILL BE PREPARED BY THE OPERATOR AND SUBMITTED TO THE OWNER FOR REVIEW AND WRITTEN APPROVAL BY THE PROJECT OWNER (OR DESIGNATED REPRESENTATIVE). ALL OWNER ACCEPTED AND DENIED SWPPP AMENDMENTS AND SITE PLANS MUST BE RECORDED IN WRITING AND RETAINED WITH THE SWPPP.
4. THE SWPPP SHALL BE AMENDED TO INCLUDE ADDITIONAL OR MODIFIED BMPS, DESIGNED TO CORRECT IDENTIFIED PROBLEMS OR ADDRESS SITUATIONS (UNDER SECTION 6 OF THE NPDES PERMIT), PRIOR TO CONDUCTING SPECIFIC STAGES/PHASES OF THE PROJECT, AS REQUIRED BY THE OWNER AND DEFINED IN THIS PROJECT SWPPP.

THE TABLE BELOW IS A SUMMARY OF THE REQUIRED SWPPP AMENDMENTS:

SUMMARY OF OPERATOR PREPARED SWPPP AMENDMENTS (REQUIRED BY OWNER)

SWPPP AMENDMENT NAME	SWPPP AMENDMENT DETAILS	SUBMITTAL TIMEFRAME
OPERATOR CHAIN OF RESPONSIBILITY	REFER TO "CONTACT INFORMATION/RESPONSIBLE PARTIES" SECTION	7 DAY PRIOR TO INITIATING WORK
BMP AMENDMENTS	SUBSTITUTED, ADDITIONAL, OR REDUNDANT BMPS TO COMPENSATE FOR FAILING/FAILED BMPS	DURING/AFTER CONSTRUCTION ACTIVITIES
METHODS TO MINIMIZE SOIL COMPACTION	REFER TO "EXISTING SITE CONDITIONS, SOILS, AND WATER RESOURCES" SECTION	7 DAYS PRIOR TO WORK WITHIN INFILTRATION BASINS AND PRESERVED TREE AREAS
STEEP SLOPES PHASING PLAN	REFER TO "ENVIRONMENTALLY SENSITIVE AREAS" SECTION	7 DAYS PRIOR TO INITIATING WORK
SPILL PREVENTION & RESPONSE PLAN	REFER TO "POLLUTION PREVENTION MANAGEMENT MEASURES"	7 DAY PRIOR TO INITIATING WORK
DEWATERING PLAN	REFER TO "DEWATERING" SECTION	7 DAYS PRIOR TO ACTIVITY
FLOOD CONTINGENCY PLAN	REFER TO "ENVIRONMENTALLY SENSITIVE AREAS" SECTION	72 HOURS PRIOR TO ACTIVITY

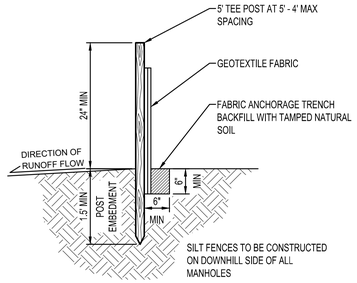
5. THE SWPPP (ORIGINAL OR COPIES), ALL CHANGES TO THE SWPPP, PROJECT MANUAL, AND INSPECTIONS/MAINTENANCE RECORDS MUST BE KEPT AT THE SITE DURING CONSTRUCTION BY THE OPERATOR WHO HAS OPERATIONAL CONTROL OF THAT PORTION OF THE SITE. THE SWPPP CAN BE KEPT IN THE FIELD OFFICE OR ON SITE VEHICLE DURING NORMAL WORKING HOURS. THE PERMITTEES MUST KEEP AND MAKE AVAILABLE TO FEDERAL, STATE, AND LOCAL OFFICIALS WITHIN THREE DAYS THE SWPPP, OTHER STORMWATER RELATED PERMITS, RECORDS OF ALL INSPECTION/MAINTENANCE, ALL PERMANENT OPERATIONS AND MAINTENANCE AGREEMENTS, ALL REQUIRED CALCULATIONS FOR DESIGN OF THE TEMPORARY AND PERMANENT STORMWATER MANAGEMENT SYSTEMS AND OTHER INFORMATION REQUIRED BY THE GENERAL PERMIT FOR THREE YEARS FOLLOWING THE NOTICE OF TERMINATION.
6. THE OPERATOR MUST ASSIGN A TRAINED INDIVIDUAL(S) (PURSUANT TO SECTION 21) TO OVERSEE THE IMPLEMENTATION, MAINTENANCE, AND REPAIR OF BMPS. THIS INDIVIDUAL(S) SHALL ALSO PERFORM INSPECTIONS, REVISE/AMEND THE SWPPP (DOCUMENT IN SWPPP AS NECESSARY), AND BE AVAILABLE FOR AN ONSITE INSPECTION WITHIN 72 HOURS UPON REQUEST BY THE PERMITTED OWNER (OR ITS DESIGNEE), LOCAL GOVERNMENT UNITS, OR MPCA. MNDOT LEAD PROJECTS REQUIRE AVAILABLE ONSITE INSPECTION WITHIN 24 HOURS.

POLLUTION PREVENTION MANAGEMENT MEASURES
POTENTIAL SOURCES OF POLLUTANTS FROM CONSTRUCTION ACTIVITIES INCLUDE:
- SEDIMENT AND FUGITIVE DUST GENERATED FROM CLEARING AND GRUBBING, IMPORT/EXPORT OPERATIONS, REMOVALS/COMPACTION, MASS/FINE GRADING, EXCAVATIONS, TRENCHING, TOPSOIL STRIPING STOCKPILING, WET/DRY PAVEMENT CUTTING, STREET CONSTRUCTION.
- BASIC/ACIDIC PH LEVELS FROM CURB AND GUTTER, MANHOLE STRUCTURES, SIDEWALKS, DRIVEWAY APRONS, FOUNDATIONS, BRIDGE ABUTMENTS, WET/DRY PAVEMENT CUTTING, MASONRY WASH/CURE/LEAKOUT.
- EXCESS NUTRIENTS FROM LANDSCAPING INSTALLATIONS, SOIL ADDITIVES, FERTILIZATION, MULCHING
- HYDROCARBONS FROM STREET CONSTRUCTION, DEMOLITION/REMOVALS, WET/DRY PAVEMENT CUTTING

OPERATOR WILL COMPLY WITH ALL OF THE POLLUTION PREVENTION AND MANAGEMENT MEASURES IDENTIFIED IN THE NPDES-CSW PERMIT. OPERATOR WILL SUBMIT A SPILL PREVENTION AND RESPONSE PLAN (SPRP) TO THE ENGINEER PRIOR TO ANY CONSTRUCTION ACTIVITY, THE SPRP MUST SATISFACTORILY ADDRESS (AT A MINIMUM) THE FOLLOWING NPDES REQUIREMENTS BY THE PROPOSED IMPLEMENTATION AND MAINTENANCE OF APPROPRIATE BMPS:

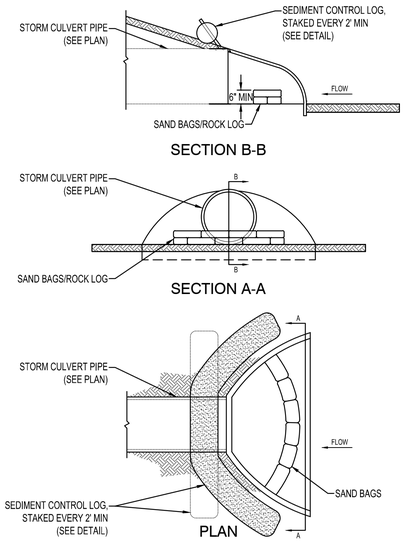
NO-EXPOSURE: CONSTRUCTION AND BUILDING PRODUCTS (THAT HAVE THE POTENTIAL TO LEACH POLLUTANTS), PESTICIDES, HERBICIDES, INSECTICIDES, FERTILIZERS, TREATMENT CHEMICALS, AND LANDSCAPING MATERIALS MUST BE UNDER COVER (PLASTIC SHEETING OR TEMPORARY ROOFS) TO MINIMIZE CONTACT WITH STORMWATER AND PRECIPITATION.

SOLID WASTE: (SEDIMENT, ASPHALT, CONCRETE MILLINGS, CONSTRUCTION, AND DEMOLITION DEBRIS) AND OTHER WASTES MUST BE DISPOSED OF PROPER



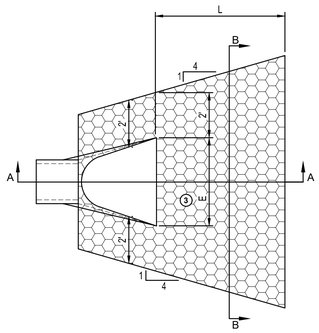
SILT FENCE

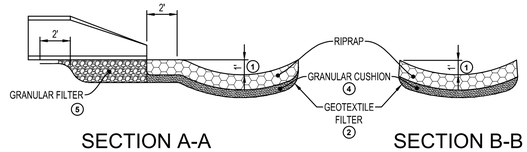
NTS EC100



CULVERT PIPE DITCH CHECK

NTS EC345





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:

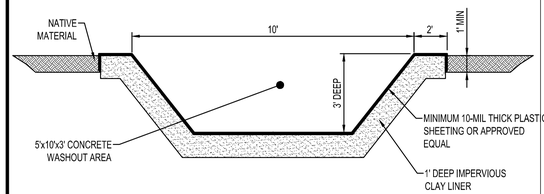
REQUIREMENTS FOR GEOTEXTILE TYPE, RIPRAP SIZE AND THICKNESS WILL BE DESIGNATED IN THE PLANS.

PIPE SIZES LARGER THAN THOSE SHOWN REQUIRE A SPECIAL DESIGN

1. FOR PIPES GREATER THAN OR EQUAL TO 30", USE 1.5'
2. GEOTEXTILE FILTER, MnDOT SPEC. 3733, SHALL COVER THE BOTTOM AND SIDES OF THE AREA EXCAVATED FOR THE RIPRAP, GRANULAR FILTER MATERIALS
3. DIMENSION "E" IS GIVEN ON MnDOT STANDARD PLATES 3100 AND 3110.
4. GRANULAR FILTER, MnDOT SPEC. 3601, MAY BE USED AS A CUSHIONLAYER. PLACE FILTER PER SPEC. 2511. THE CUSHION LAYER IS INCIDENTAL
5. 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.

RIPRAP AT RCP OUTLET

NTS EC400



NOTES:

CONTRACTOR SHALL INSTALL A SIGN INDICATING THE CONCRETE WASHOUT AREA.

CONTRACTOR SHALL MAINTAIN WASHOUT AREA TO REMOVE MATERIALS BEYOND 75% CAPACITY.

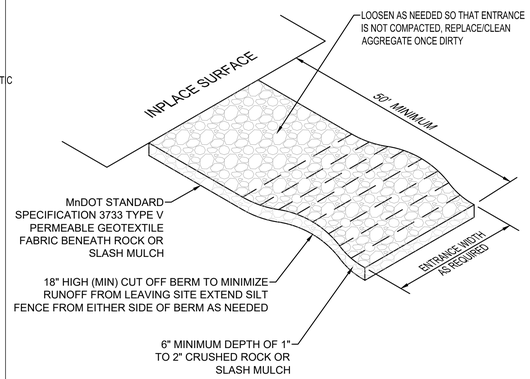
WASHOUT AREA SHALL NOT BE PLACED WITHIN 50' OF STORM DRAINS, OPEN DITCHES OR BODIES OF WATER.

CONTRACTOR SHALL INSPECT WASHOUT AREA AS NECESSARY TO PREVENT LEAKS AND OVER TOPPING.

WASHOUT AREA SHALL BE REMOVED AFTER CONSTRUCTION IS COMPLETE.

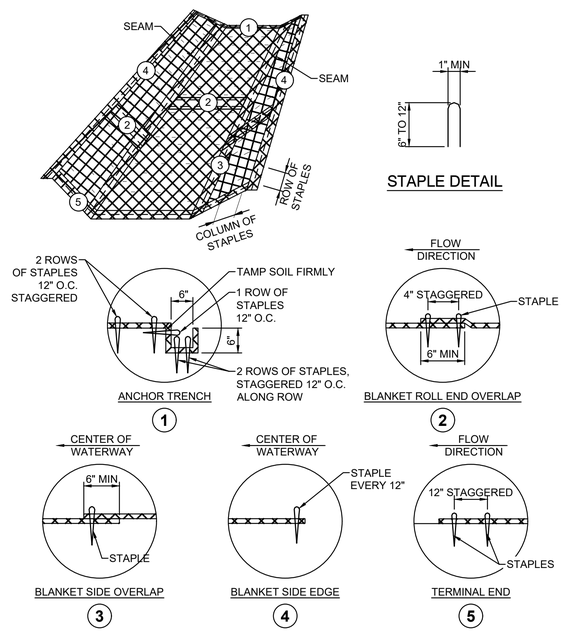
CONCRETE WASHOUT

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)

1. 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.
2. C. 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.
3. D. MATS ON SIDE SLOPES SHALL OVERLAP A MINIMUM OF 6" OVER THE MAT BELOW (SHINGLE STYLE). STAPLE OVERLAP AT 12" INTERVALS. (SEE DETAIL 3)
4. E. THE OUTER EDGE ALONG SIDES OF THE MAT SHALL BE STAPLED EVERY 12". (SEE DETAIL 4)

F. 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.

5. G. 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

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

PROJECT

LENNAR

RESERVE AT AUTUMN WOODS

CHASKA MINNESOTA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

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

TITLE

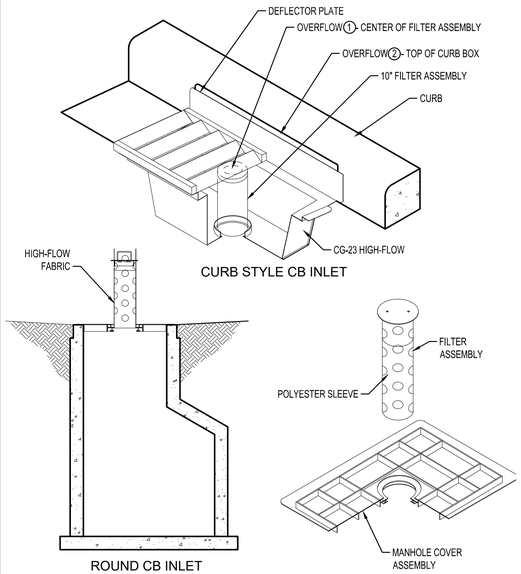
SWPPP DETAILS

SHEET

11

OF 47

PLOT DATE: 6/30/2021 6:05 PM

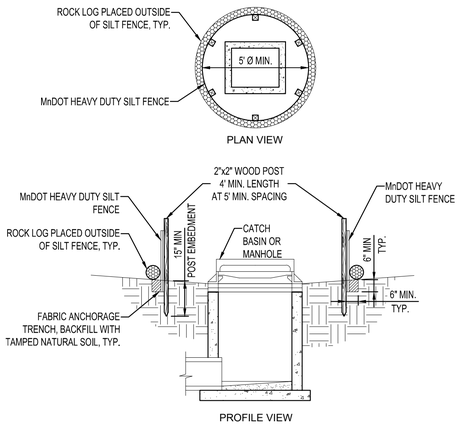


CURB STYLE CB INLET

ROUND CB INLET

STREET INLET PROTECTION

NTS EC225



SILT FENCE INLET PROTECTION

NTS EC220

PRELIMINARY NOT FOR CONSTRUCTION

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

PROJECT

LENNAR

RESERVE AT AUTUMN WOODS

CHASKA MINNESOTA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

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

TITLE

SWPPP DETAILS

SHEET

12

OF 47

PLOT DATE: 6/30/2021 6:05 PM

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)

a. Natural topography and soil conditions must be protected, including retention onsite of native topsoil to the greatest extent possible.

b. 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.

c. 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.

d. Construction site waste such as discarded building materials, concrete truck washout, chemicals, litter and sanitary waste must be properly managed.

e. 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.

f. All temporary erosion and sediment control BMPs must be removed upon final stabilization.

g. 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.

h. 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.

i. 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.

j. 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.

k. 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.

l. 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 __
PC	PERIMETER CONTROL
	STORM DRAIN INLET PROTECTION
	STABILIZED CONSTRUCTION EXIT
	EROSION CONTROL BLANKET, CATEGORY __
	CONCRETE WASHOUT AREA
	EXISTING DRAINAGE ARROW
	PROPOSED DRAINAGE ARROW
101	EXISTING CONTOUR (MINOR INTERVAL)
100	EXISTING CONTOUR (MAJOR INTERVAL)
101	PROPOSED CONTOUR (MINOR INTERVAL)
100	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.

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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)

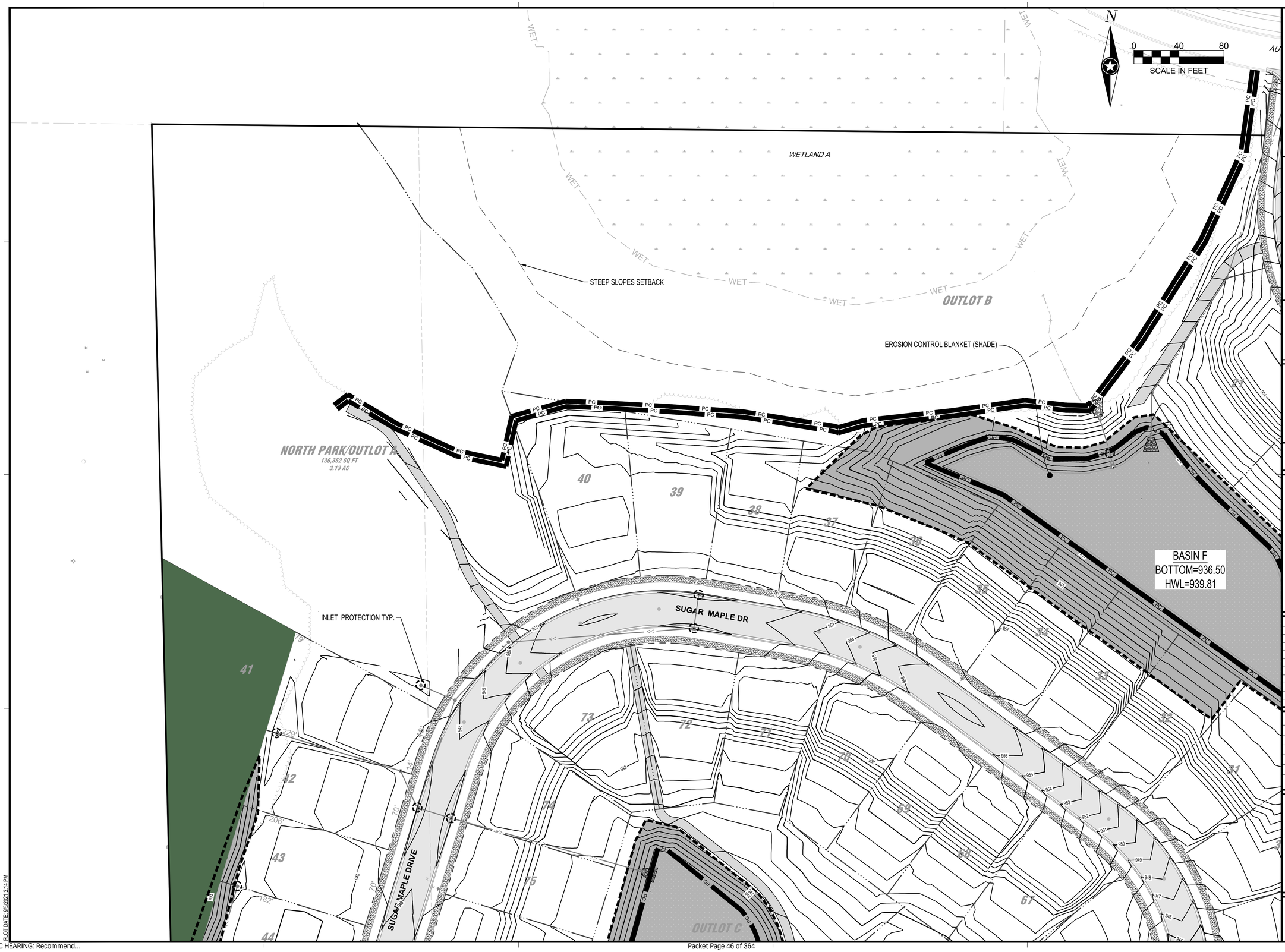
SHEET

13

OF 47

PRELIMINARY NOT FOR CONSTRUCTION

PLOT DATE: 9/5/2021 2:14 PM



PRELIMINARY NOT FOR CONSTRUCTION

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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 (NW)

SHEET

14 OF 47

PLOT DATE: 6/5/2021 2:14 PM

ROCK CONSTRUCTION ENTRANCE

CONCRETE WASHOUT

AUTUMN WOODS DR

EROSION CONTROL BLANKET, TYP. (SHADE)

BENCHMARK HYDRANT
T.N.F.H 954.44

AUDUBON ROAD (COUNTY ROAD 15)

IRONWOOD BLVD.

INLET PROTECTION TYP.

OUTLOT B

WET

BASIN F
BOTTOM=936.50
HWL=939.81

N

0 40 80
SCALE IN FEET

PLOT DATE: 6/5/2021 2:14 PM

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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.	-

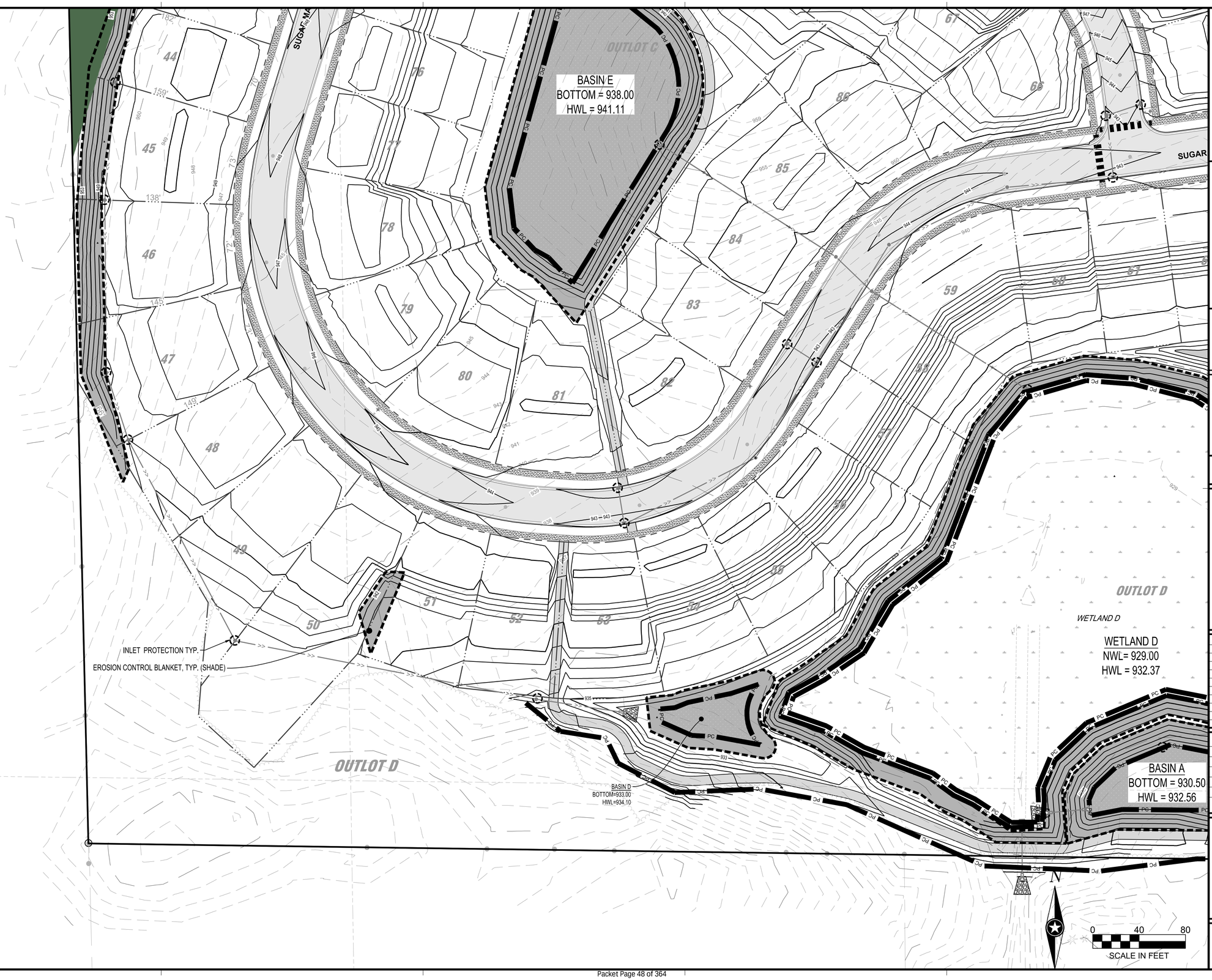
TITLE

PROPOSED SWPPP (NE)

SHEET

15 OF 47

PRELIMINARY NOT FOR CONSTRUCTION



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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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

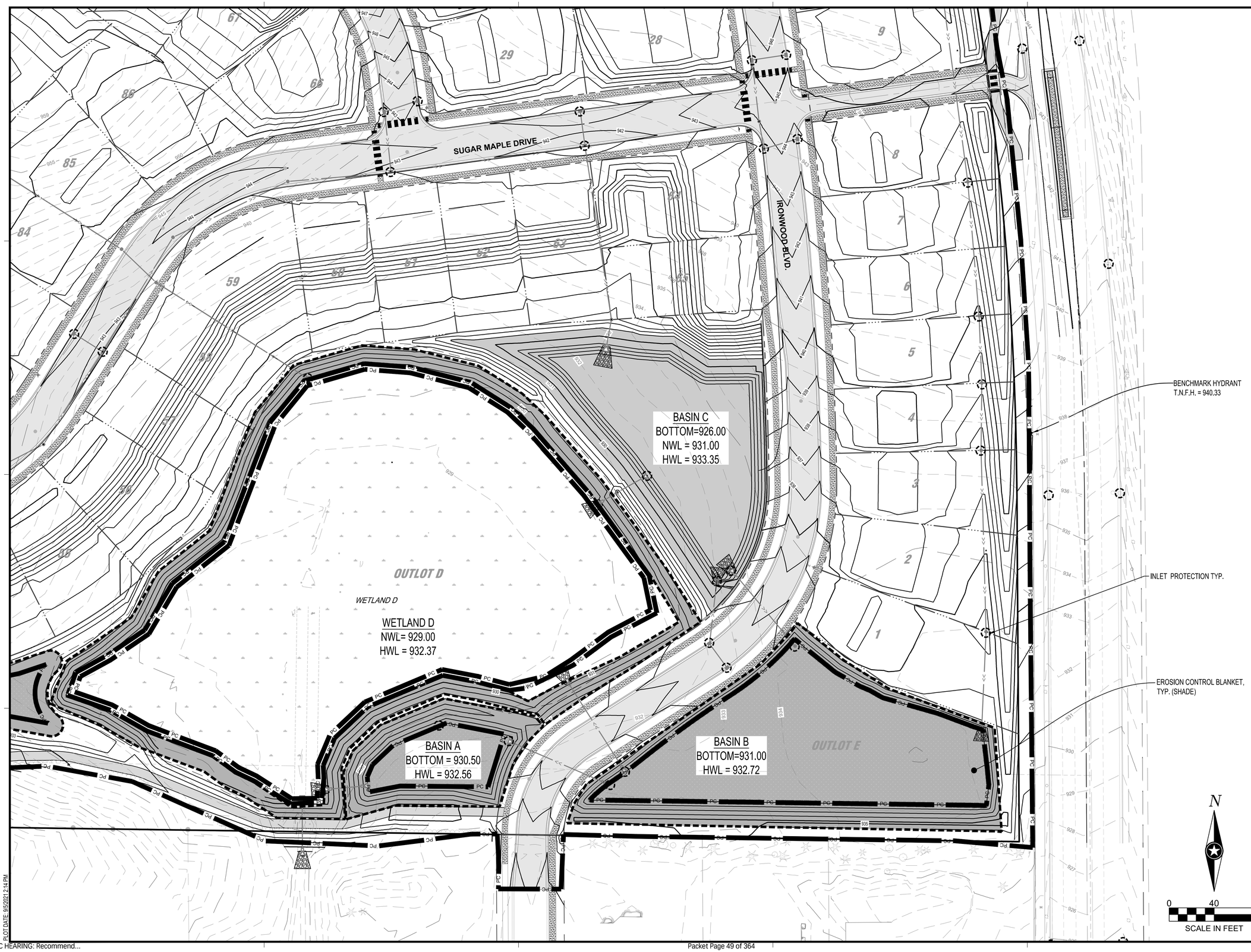
PROPOSED SWPPP (SW)

SHEET

16 OF 47

PRELIMINARY NOT FOR CONSTRUCTION

PLOT DATE: 9/5/2021 2:14 PM



PRELIMINARY NOT FOR CONSTRUCTION

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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

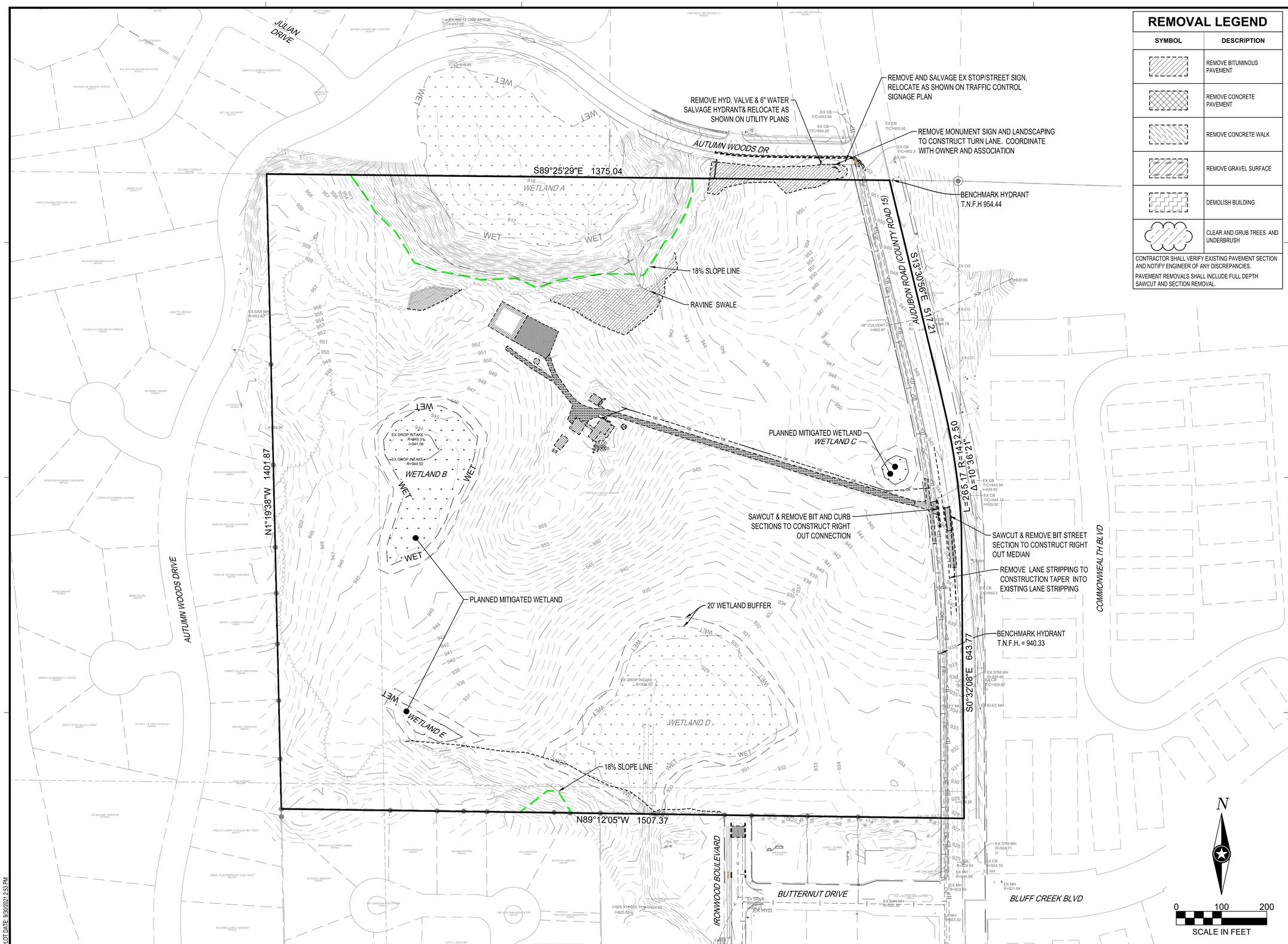
PROPOSED SWPPP (SE)

SHEET

17

OF 47

PLOT DATE: 9/6/2021 2:14 PM


JULIAN DRIVE
AUTUMN WOODS DR
S89°25'29"E 1375.04
AUDUBON ROAD (COUNTY ROAD 15)
S1°33'05"E 517.21
N1°19'38"W 1401.87
AUTUMN WOODS DRIVE
N89°12'05"W 1507.37
S0°32'08"E 643.77
L=265.17 R=1432.50 Δ=10°36'21"
COMMONWEALTH BLVD
IRONWOOD BOULEVARD
BUTTERNUT DRIVE
BLUFF CREEK BLVD
WETLAND A
WETLAND B
WETLAND C
WETLAND D
WETLAND E
WET
REMOVE AND SALVAGE EX STOP/STREET SIGN, RELOCATE AS SHOWN ON TRAFFIC CONTROL SIGNAGE PLAN
REMOVE HYD, VALVE & 6" WATER SALVAGE HYDRANT& RELOCATE AS SHOWN ON UTILITY PLANS
REMOVE MONUMENT SIGN AND LANDSCAPING TO CONSTRUCT TURN LANE. COORDINATE WITH OWNER AND ASSOCIATION
BENCHMARK HYDRANT T.N.F.H 954.44
18% SLOPE LINE
RAVINE SWALE
PLANNED MITIGATED WETLAND
SAWCUT & REMOVE BIT AND CURB SECTIONS TO CONSTRUCT RIGHT OUT CONNECTION
SAWCUT & REMOVE BIT STREET SECTION TO CONSTRUCT RIGHT OUT MEDIAN
REMOVE LANE STRIPPING TO CONSTRUCTION TAPER INTO EXISTING LANE STRIPPING
BENCHMARK HYDRANT T.N.F.H. = 940.33
20' WETLAND BUFFER
18% SLOPE LINE
EX DROP INTAKE R=945.34 I=941.08
EX DROP INTAKE R=944.52
EX DROP INTAKE R=928.92
EX SAN MH R=953.62
EX HYD
EX STM MH R=924.71
EX CB R=924.93
EX MH R=924.56
EX MH R=923.39
EX MH R=921.64
EX STM MH R=935.64
EX CB T/C=935.67
EX ELEC MH
EX CB T/C=943.94 I=939.62
EX CB T/C=944.17 I=939.92
EX CB T/C=940.5
EX CB T/C=953.94
EX CB T/C=954.28
EX CB T/C=953.95
EX CB T/C=952.3
EX NH
EX CO
EX CB T/C=946.78
18" CULVERT I=942.87
EX 12" CMP APRON I=917.02
EX 12" CMP APRON I=916.85
EX 12" CMP APRON I=925.31
EX 12" CMP APRON I=925.14
EX 12" CMP APRON I=924.63
EX 12" CMP APRON I=925.06
EX 12" CMP APRON I=925.40
EX 12" CMP APRON I=925.23
EX 12" CMP APRON I=925.06
EX 12" CMP APRON I=924.89
EX 12" CMP APRON I=924.72
EX 12" CMP APRON I=924.55
EX 12" CMP APRON I=924.38
EX 12" CMP APRON I=924.21
EX 12" CMP APRON



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

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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.	-

TITLE

OVERALL SITE PLAN

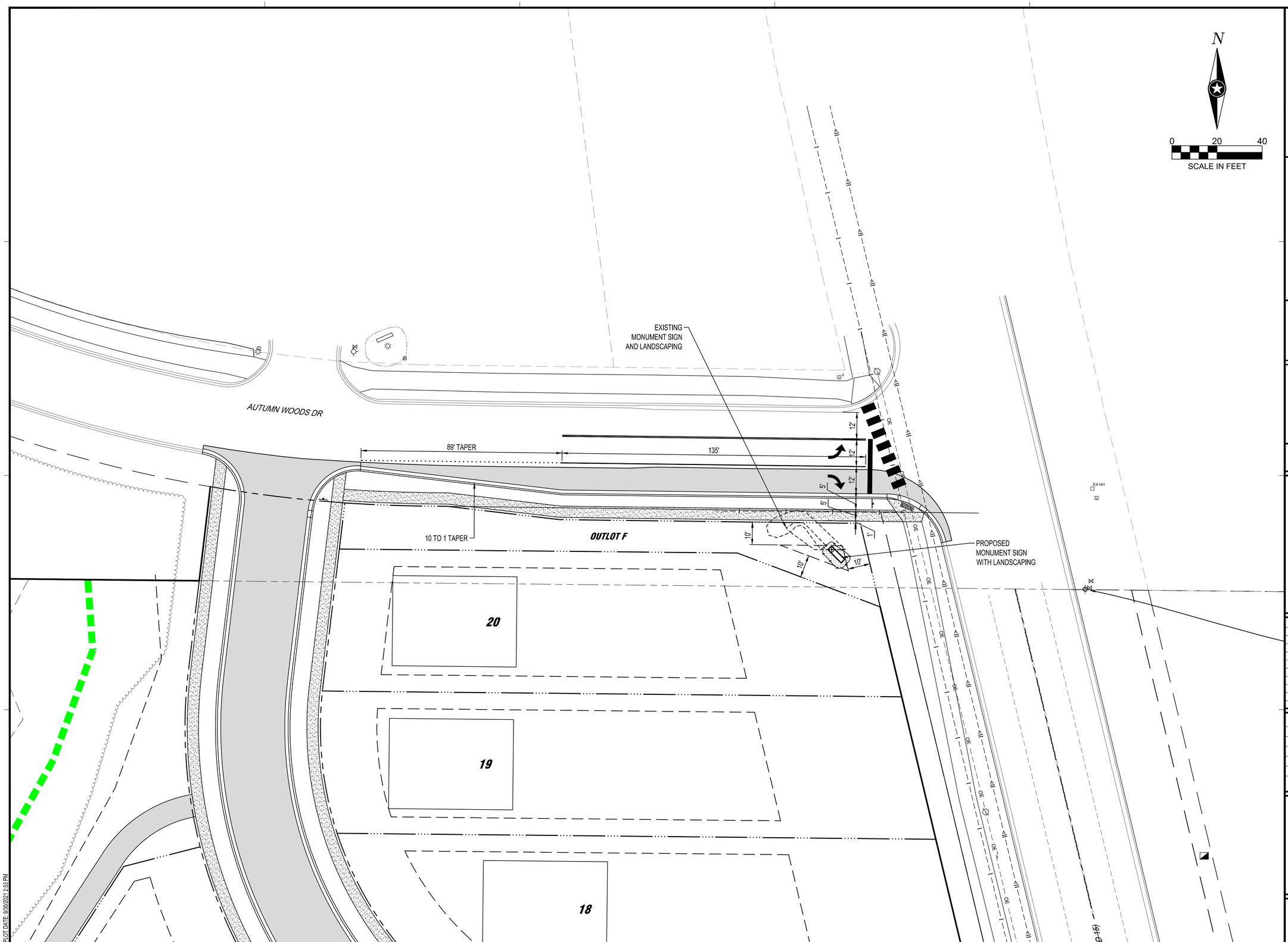
SHEET

19

OF 47

PRELIMINARY NOT FOR CONSTRUCTION

PLOT DATE: 9/30/2021 2:53 PM



PLOT DATE: 9/30/2021 2:53 PM

PRELIMINARY NOT FOR CONSTRUCTION

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

PROJECT

LENNAR

RESERVE AT AUTUMN WOODS

CHASKA MINNESOTA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

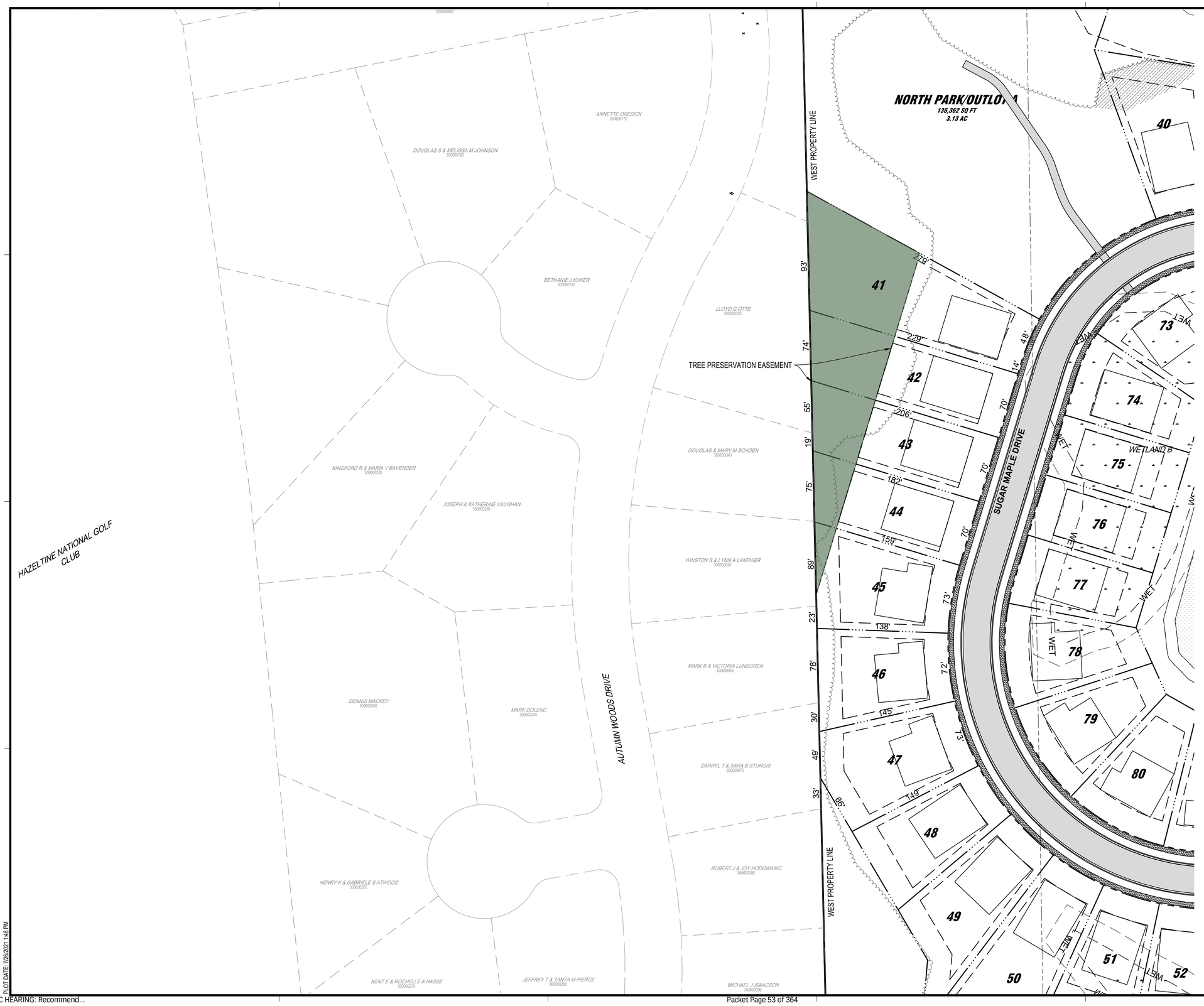
PROJECT NO.	21-24984
FILE NAME	24984 SITE
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

TITLE

AUTUMN WOODS DR. PROPOSED IMPROVEMENTS

SHEET

20 OF 47



PRELIMINARY NOT FOR CONSTRUCTION

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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.	-

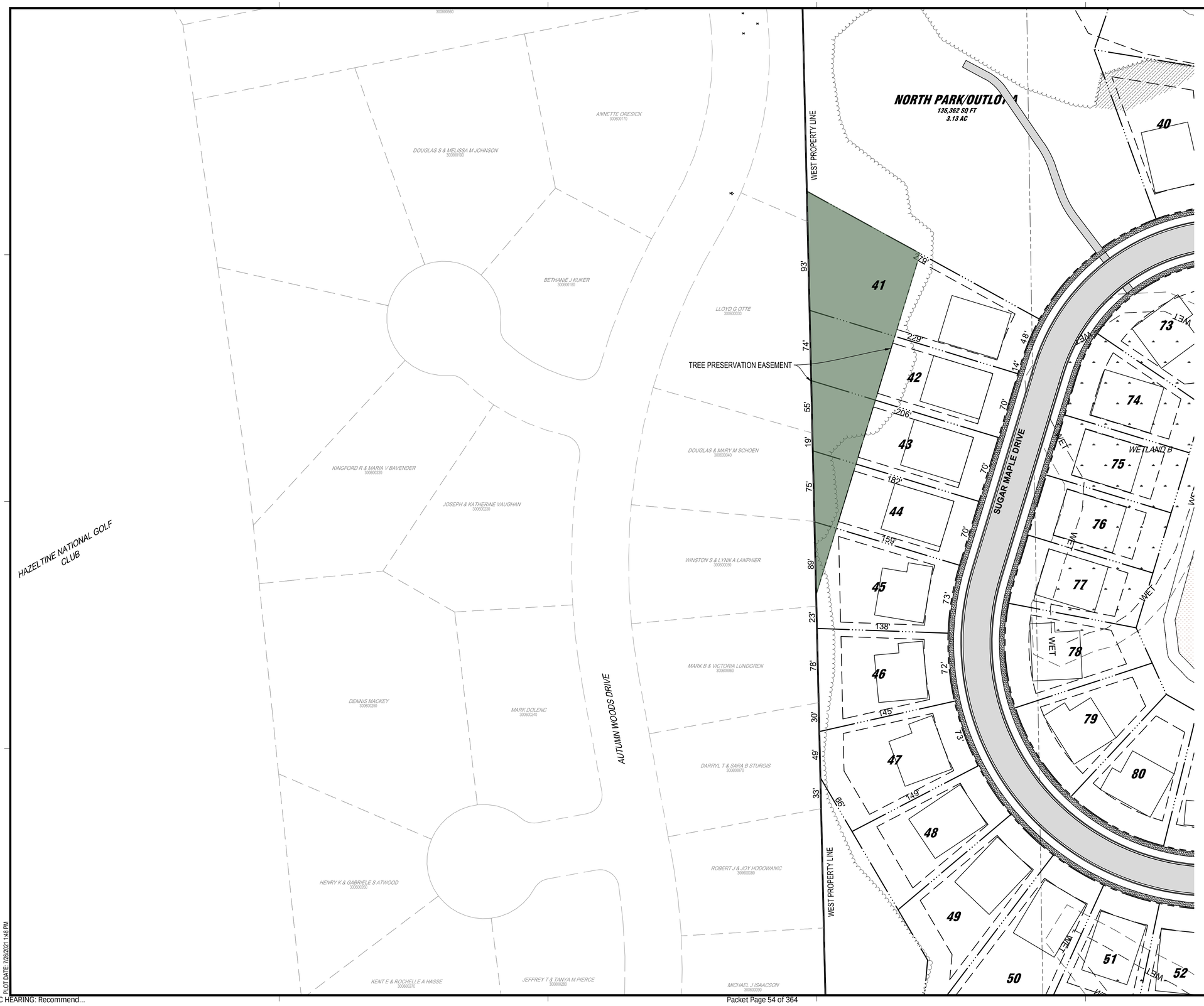
TITLE

WEST PROPERTY LOT COMPARISON EXHIBIT

SHEET

21A OF 47

PLOT DATE: 7/28/2021 1:48 PM



PLOT DATE: 7/28/2021 1:48 PM

PRELIMINARY NOT FOR CONSTRUCTION

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

PROJECT

LENNAR

RESERVE AT AUTUMN WOODS

CHASKA MINNESOTA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

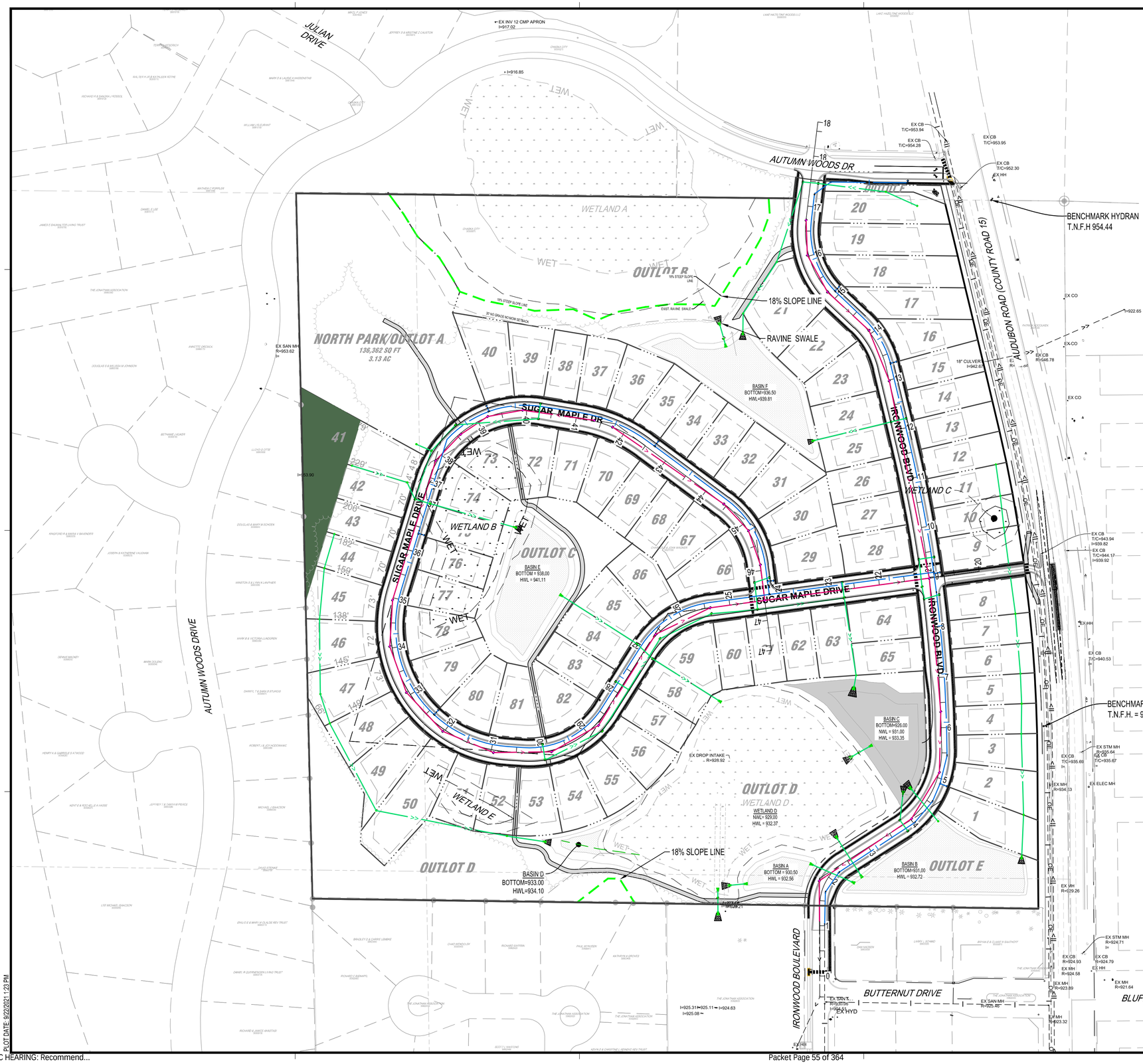
PROJECT NO.	21-24984
FILE NAME	24984 LOT EXHIBIT
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

TITLE

WEST PROPERTY LOT COMPARISON EXHIBIT

SHEET

21A OF 2



UTILITY LEGEND

EXISTING		PROPOSED
>>	STORM DRAIN	>>
>	SANITARY SEWER	>
II>	SANITARY SEWER FORCEMAIN	<II
W	WATER MAIN	W
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.

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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.	-

TITLE

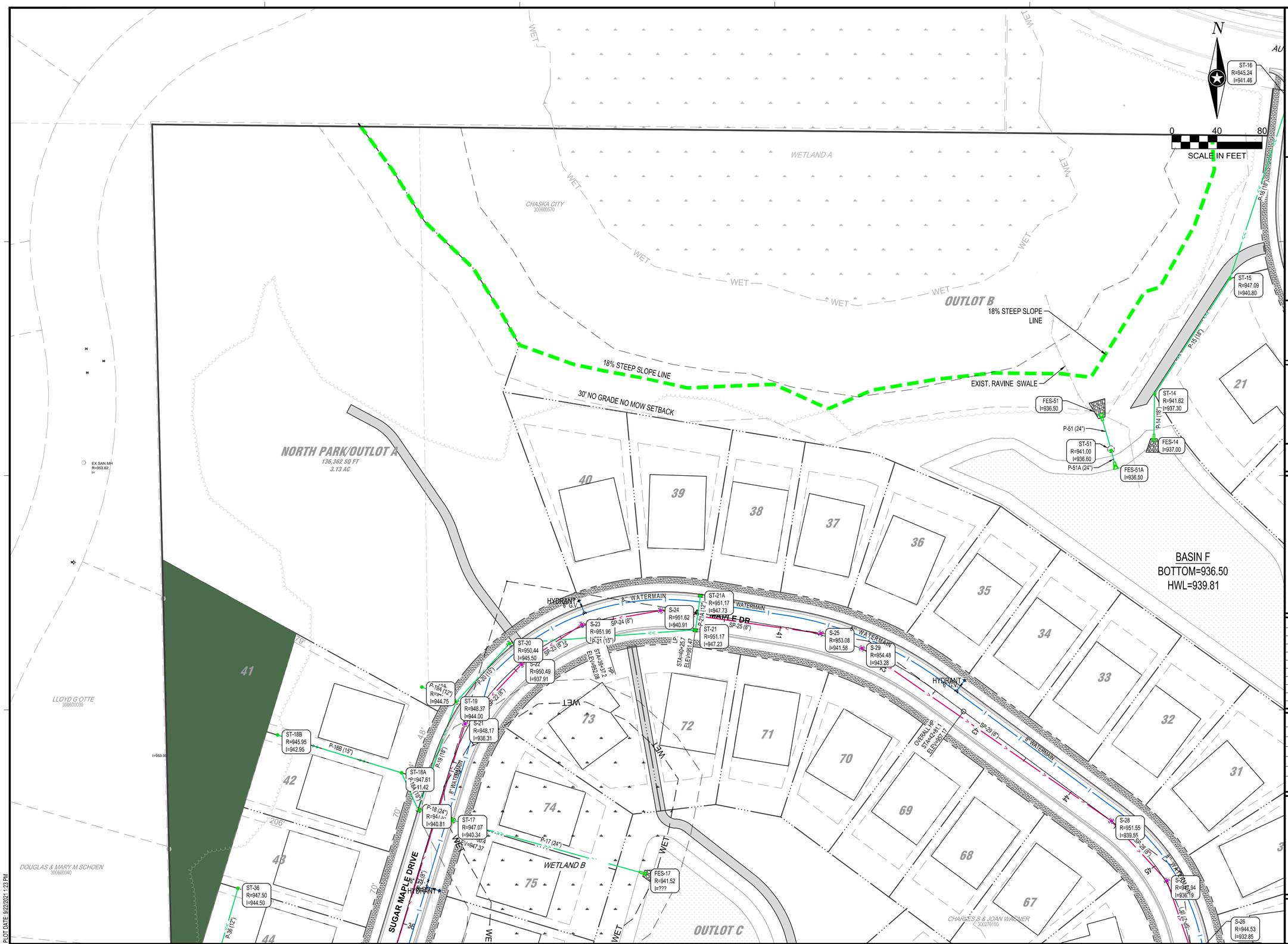
UTILITY PLAN (OVERALL)

SHEET

22 OF 47

PRELIMINARY NOT FOR CONSTRUCTION

PLOT DATE: 9/22/2021 1:23 PM



PLOT DATE: 9/22/2021 1:23 PM

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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.	-

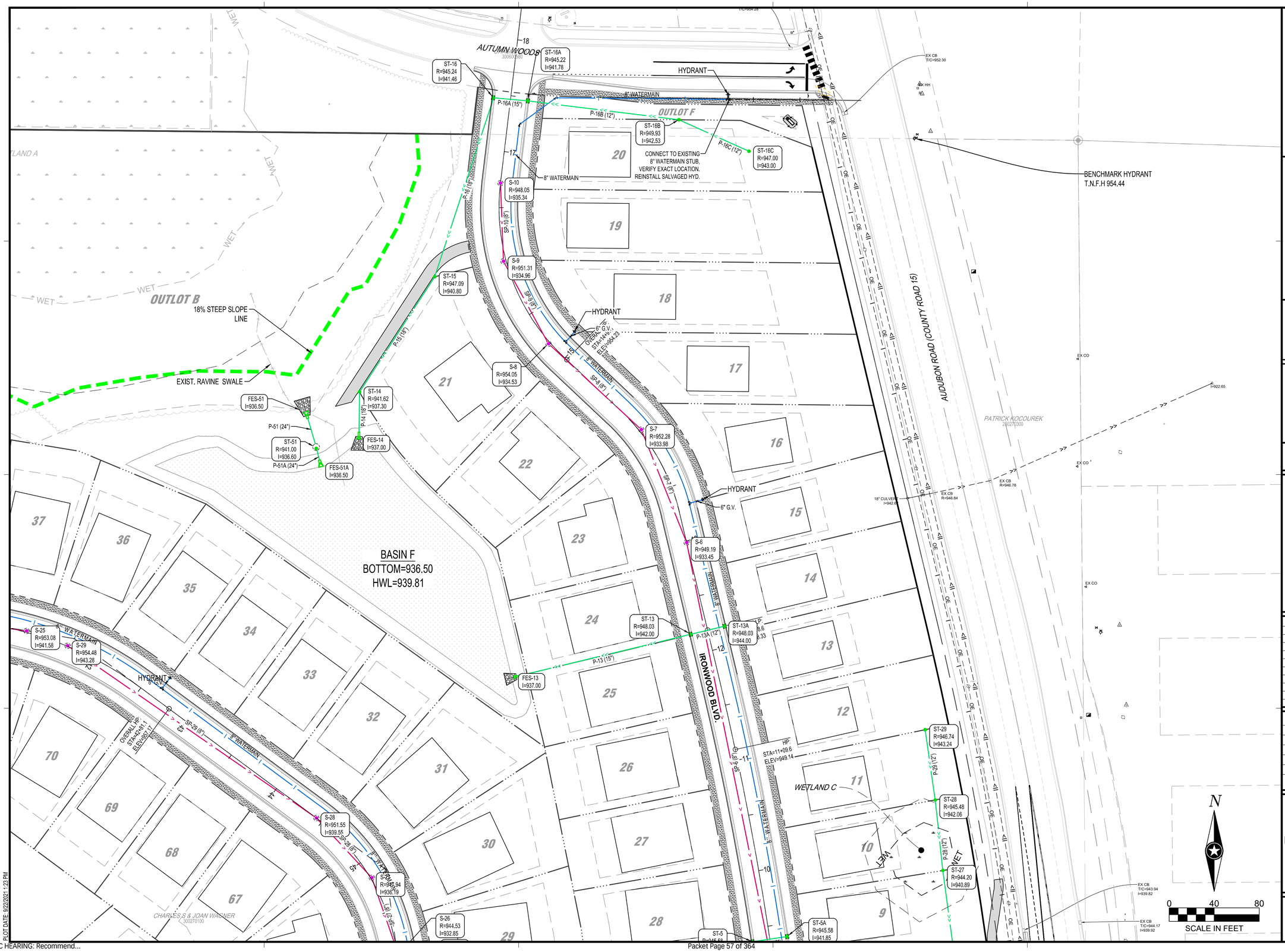
TITLE

UTILITY PLAN (NW)

SHEET

23 OF 47

PRELIMINARY NOT FOR CONSTRUCTION



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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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.	-

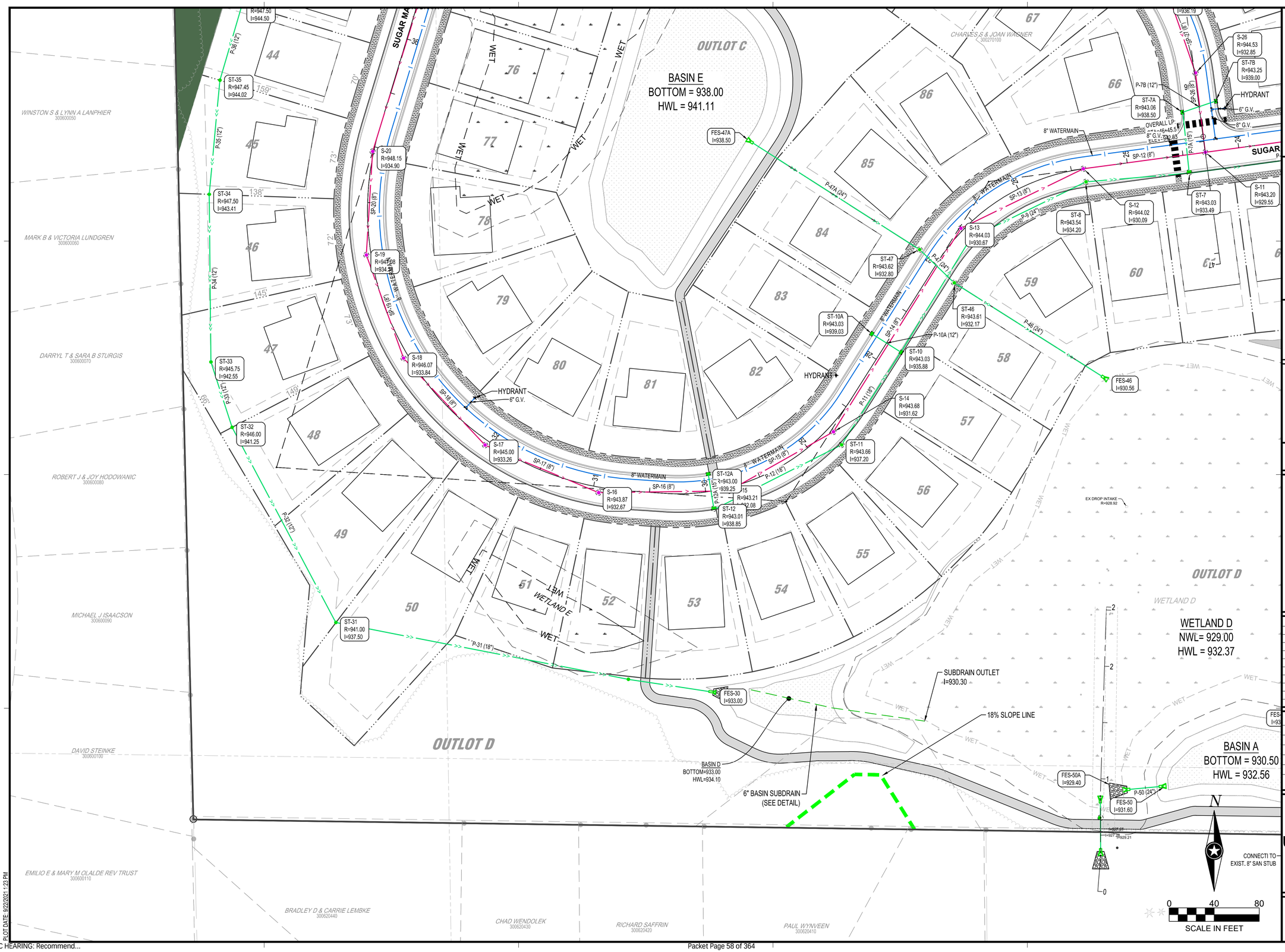
TITLE

UTILITY PLAN (NE)

SHEET

24 OF 47

PRELIMINARY NOT FOR CONSTRUCTION



PRELIMINARY NOT FOR CONSTRUCTION

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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.	-

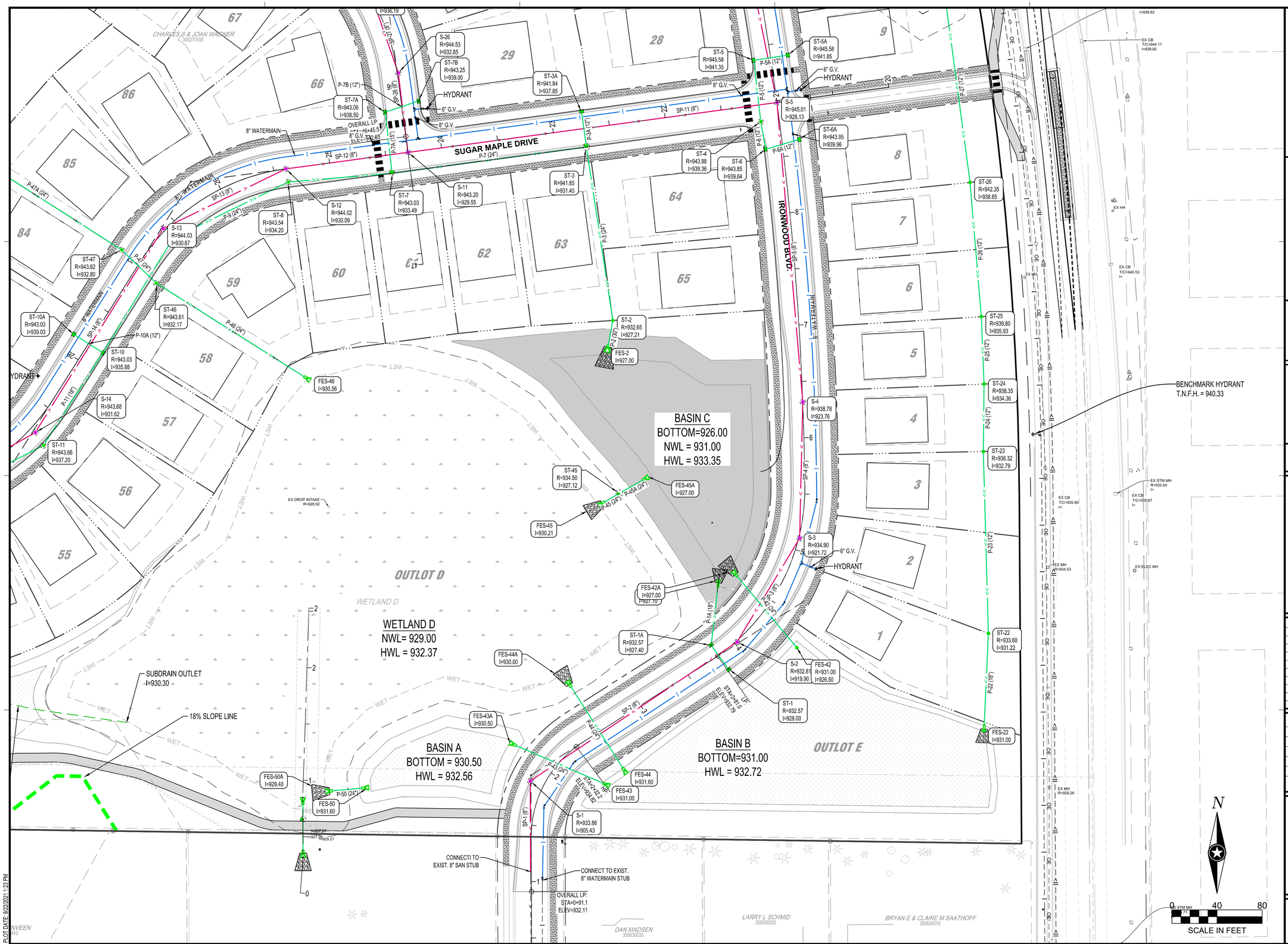
TITLE

UTILITY PLAN (SW)

SHEET

25 OF 47

PLOT DATE: 9/22/2021 1:23 PM



PRELIMINARY NOT FOR CONSTRUCTION

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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.	-

TITLE

UTILITY PLAN (SE)

SHEET

26

OF 47

PLOT DATE: 9/22/2021 1:23 PM



HYDRANT COVERAGE LEGEND

R250'

EXISTING HYDRANT

R250'

PROPOSED HYDRANT

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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

PRELIMINARY NOT FOR CONSTRUCTION

PLOT DATE: 9/30/2021 1:49 PM



PRELIMINARY NOT FOR CONSTRUCTION

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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

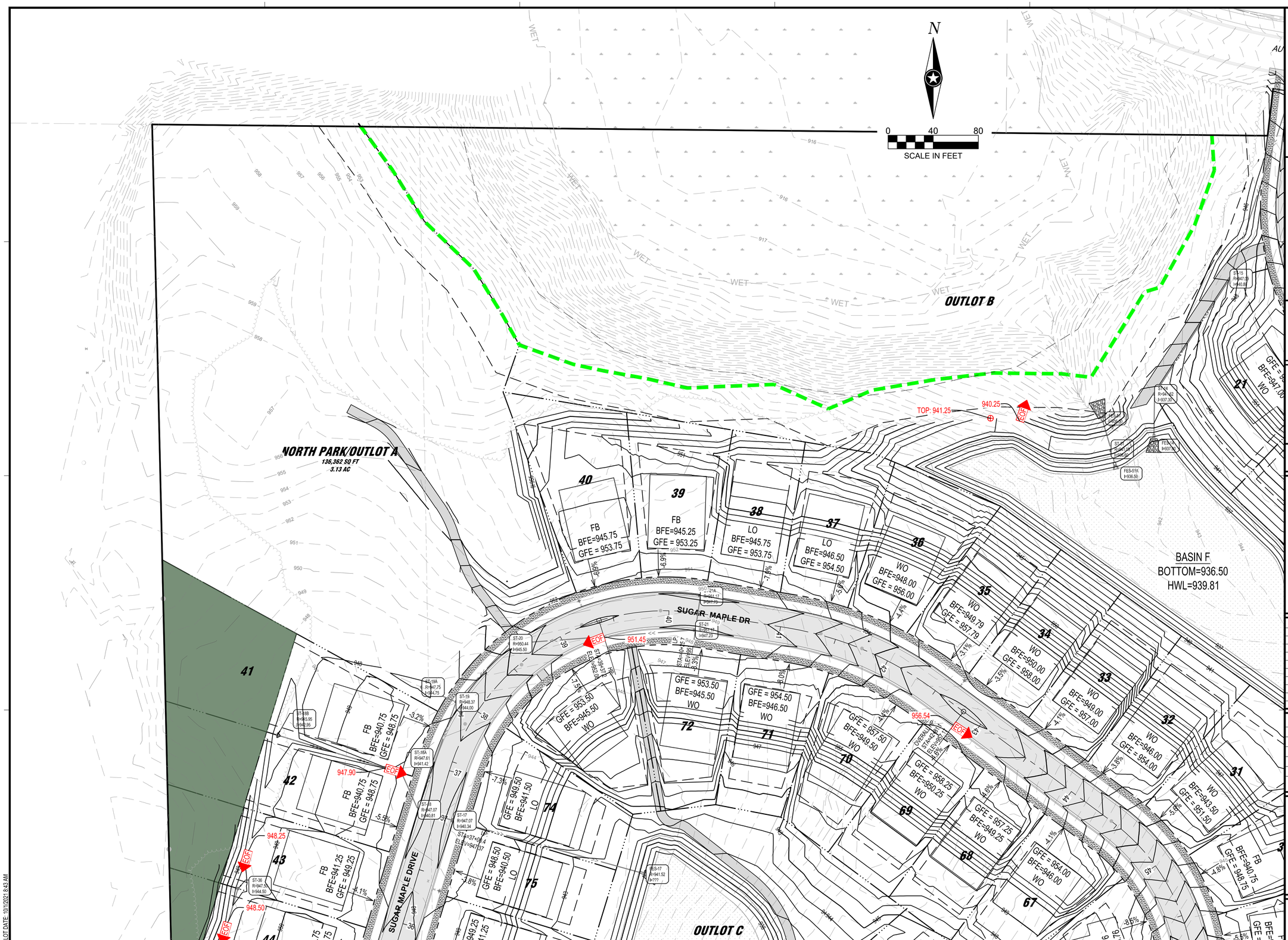
GRADING PLAN (OVERALL)

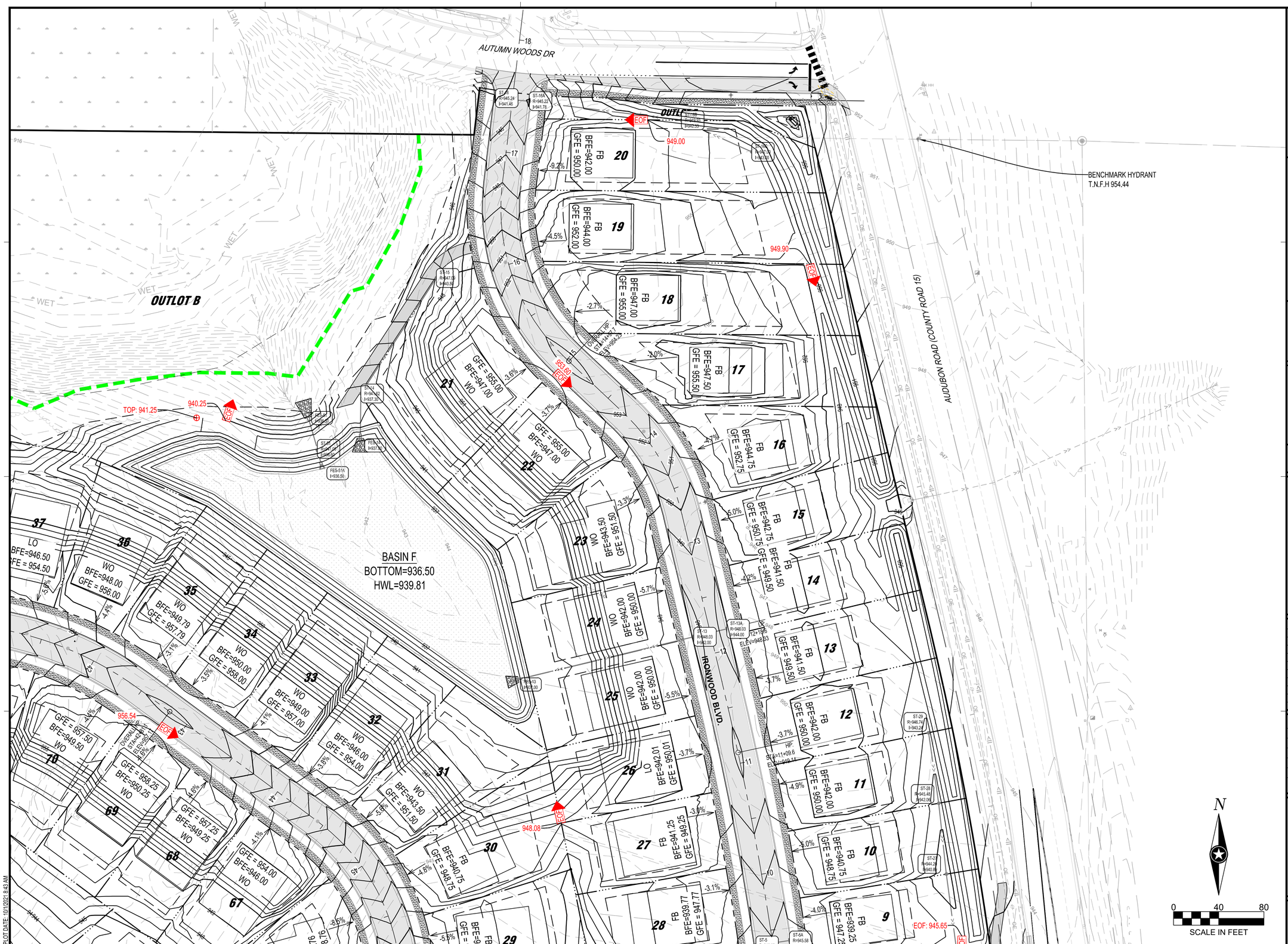
SHEET

28

OF 47

PLOT DATE: 10/1/2021 8:43 AM


N
0 40 80
SCALE IN FEET
OUTLOT B
NORTH PARK/OUTLOT A
136,362 SQ FT
3.13 AC
SUGAR MAPLE DR
SUGAR MAPLE DRIVE
OUTLOT C
BASIN F
BOTTOM=936.50
HWL=939.81
TOP: 941.25
940.25
951.45
947.90
948.25
948.50
956.54
WET
FB
LO
WO
BFE=945.75
GFE = 953.75
BFE=945.25
GFE = 953.25
BFE=946.50
GFE = 954.50
BFE=948.00
GFE = 956.00
BFE=949.79
GFE = 957.79
BFE=950.00
GFE = 958.00
BFE=949.00
GFE = 957.00
BFE=946.00
GFE = 954.00
BFE=943.50
GFE = 951.50
BFE=940.75
GFE = 948.75
BFE=941.25
GFE = 949.25
BFE=940.75
GFE = 948.75
BFE=945.50
GFE = 953.50
BFE=946.50
GFE = 954.50
BFE=949.50
GFE = 957.50
BFE=950.25
GFE = 958.25
BFE=949.25
GFE = 957.25
BFE=946.00
GFE = 954.00
BFE=940.75
GFE = 948.75
BFE=941.25
GFE = 949.25
BFE=940.50
GFE = 948.50
BFE=941.50
GFE = 949.50
BFE=945.50
GFE = 953.50
BFE=945.50
GFE = 953.50
BFE=940.75
GFE = 948.75
BFE=940.75
GFE = 948.75
BFE=941.25
GFE = 949.25
BFE=940.50
GFE = 948.50
BFE=941.50
GFE = 949.50
BFE=945.50
GFE = 953.50
BFE=946.50
GFE = 954.50
BFE=948.00
GFE = 956.00
BFE=949.79
GFE = 957.79
BFE=950.00
GFE = 958.00
BFE=949.00
GFE = 957.00
BFE=946.00
GFE = 954.00
BFE=943.50
GFE = 951.50
BFE=940.75
GFE = 948.75
BFE=941.25
GFE = 949.25
BFE=940.50
GFE = 948.50
BFE=941.50
GFE = 949.50
BFE=945.50
GFE = 953.50
BFE=946.50
GFE = 954.50
BFE=949.50
GFE = 957.50
BFE=950.25
GFE = 958.25
BFE=949.25
GFE = 957.25
BFE=946.00
GFE = 954.00



PLOT DATE: 10/1/2021 8:43 AM

PRELIMINARY NOT FOR CONSTRUCTION

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

PROJECT

LENNAR

RESERVE AT AUTUMN WOODS

CHASKA MINNESOTA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

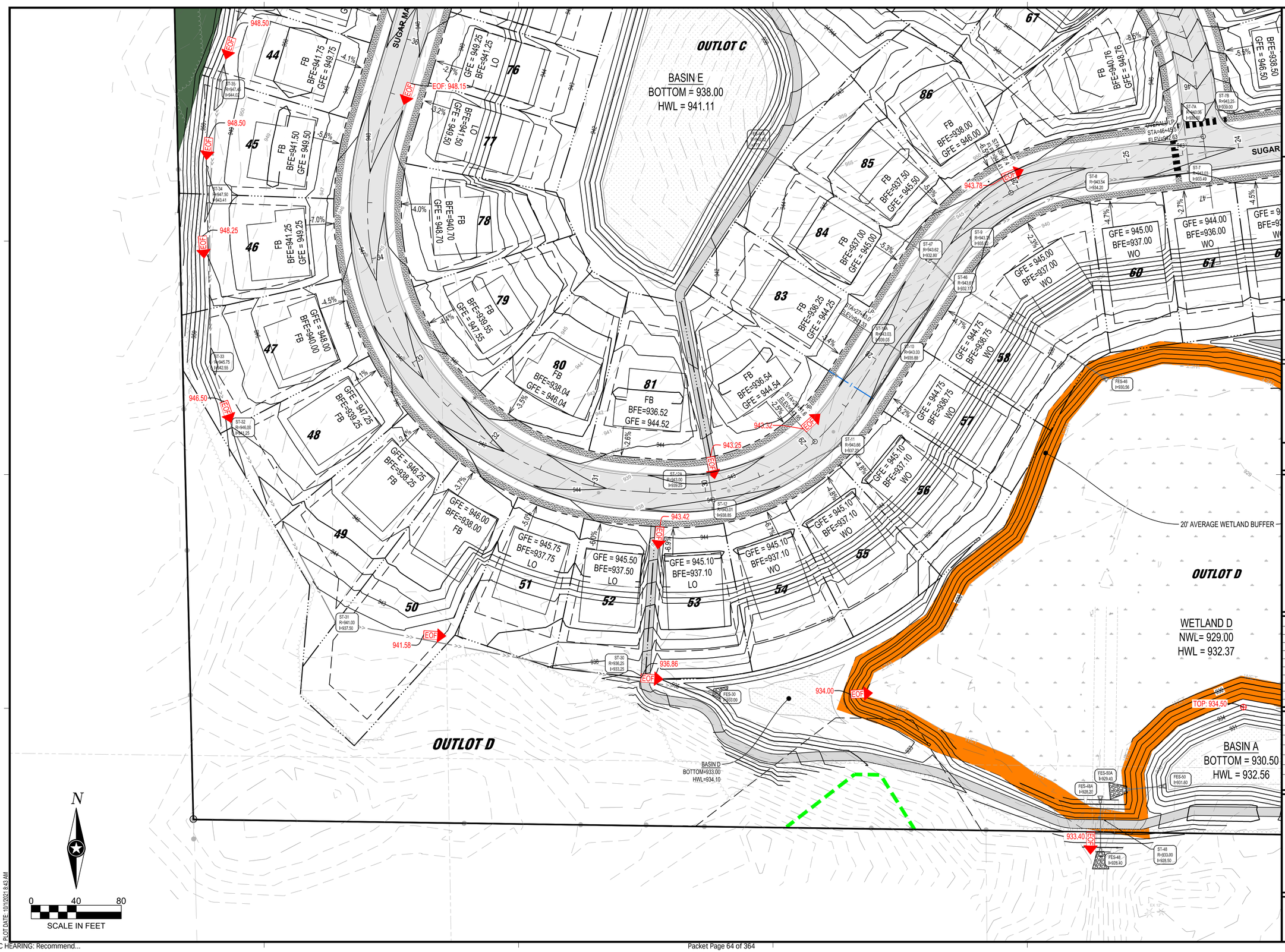
PROJECT NO.	21-24984
FILE NAME	24984 GRADE
DRAWN BY	JRS
DESIGNED BY	JRS
REVIEWED BY	JDF
ORIGINAL ISSUE DATE	07/06/21
CLIENT PROJECT NO.	-

TITLE

GRADING PLAN (NE)

SHEET

30 OF 47



PLOT DATE: 10/1/2021 8:43 AM

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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

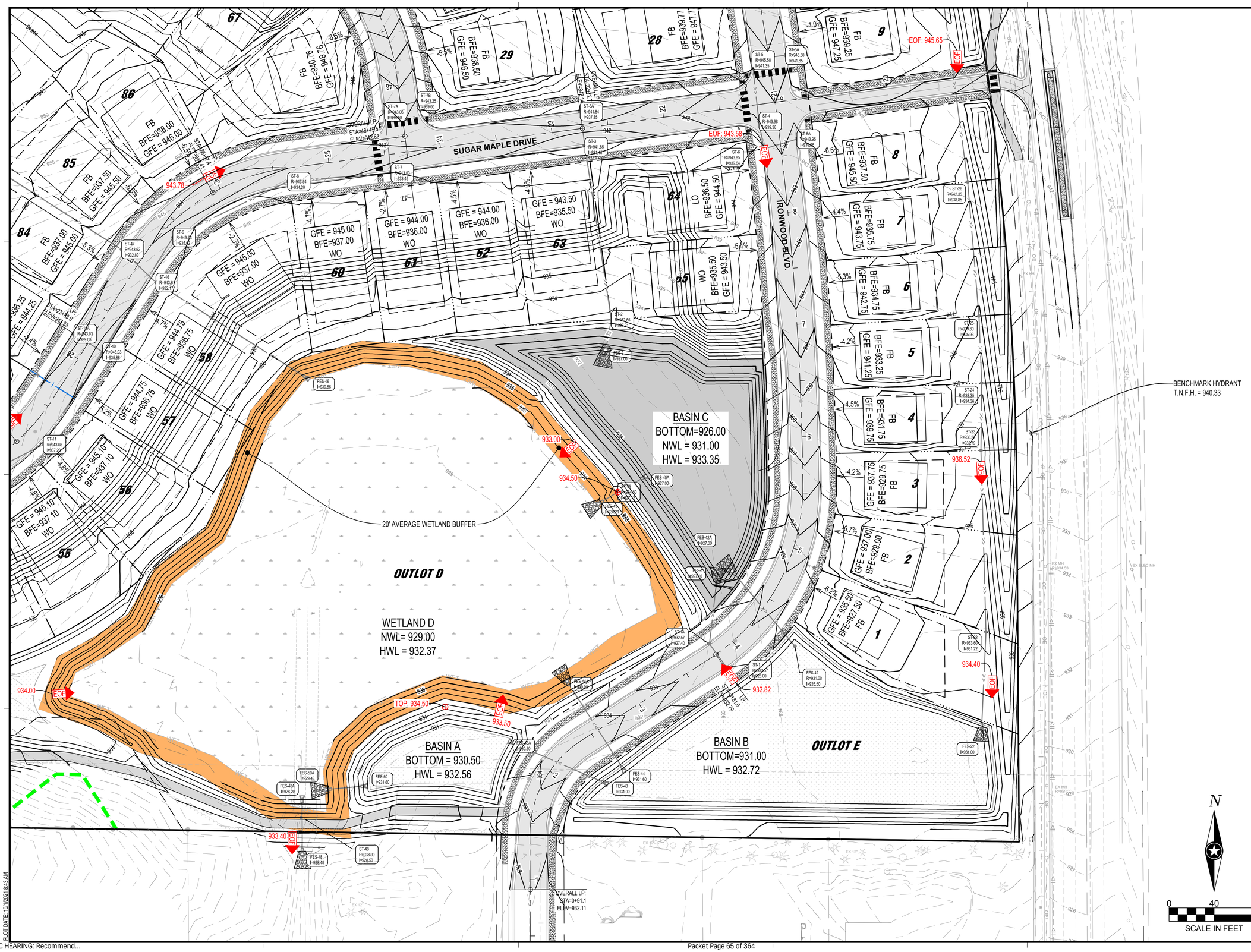
GRADING PLAN (SW)

SHEET

31

OF 47

PRELIMINARY NOT FOR CONSTRUCTION



PRELIMINARY NOT FOR CONSTRUCTION

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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

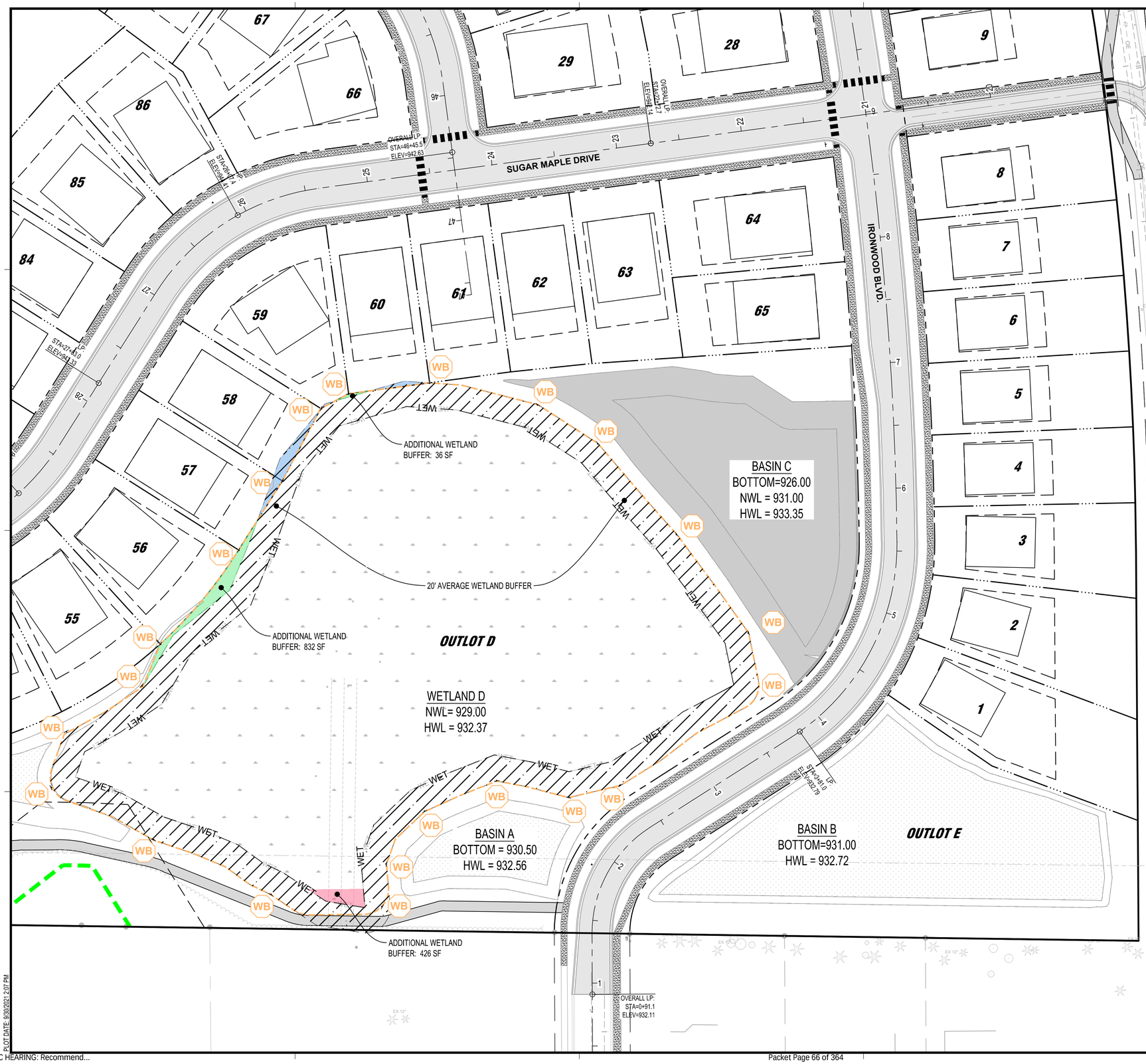
GRADING PLAN (SE)

SHEET

32

OF 47

PLOT DATE: 10/1/2021 8:43 AM



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
WB	WETLAND BUFFER SIGN, TO BE PLACED AT PROPERTY LINE OR BUFFER EDGE (PER WATERSHED DISTRICT REQUIREMENTS)

N

0 40 80

SCALE IN FEET

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

PROJECT

LENNAR

RESERVE AT 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

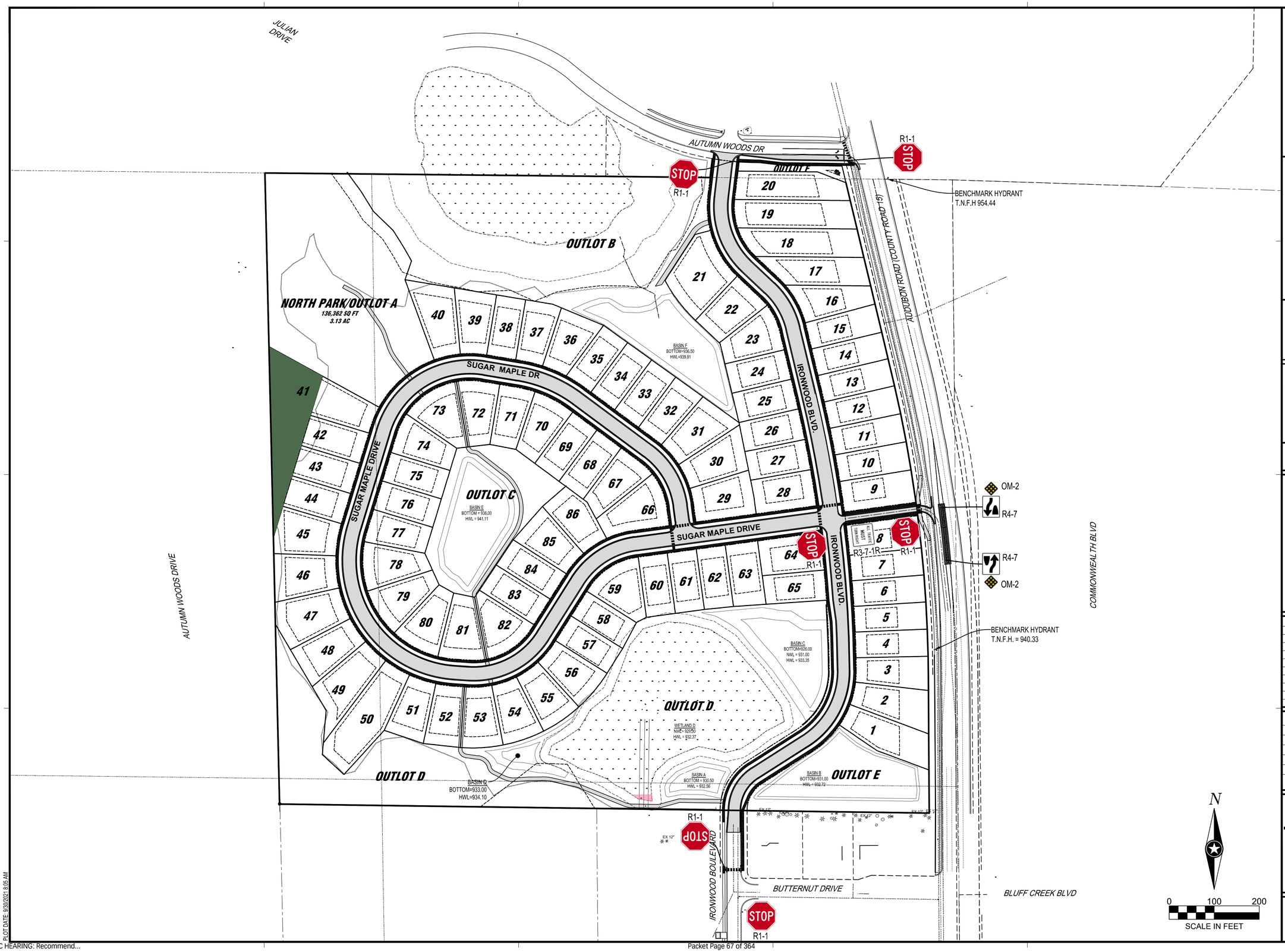
SHEET

33

OF 47

PRELIMINARY NOT FOR CONSTRUCTION

PLOT DATE: 9/30/2022 2:07 PM



PRELIMINARY NOT FOR CONSTRUCTION

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

PROJECT

LENNAR

RESERVE AT AUTUMN WOODS

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

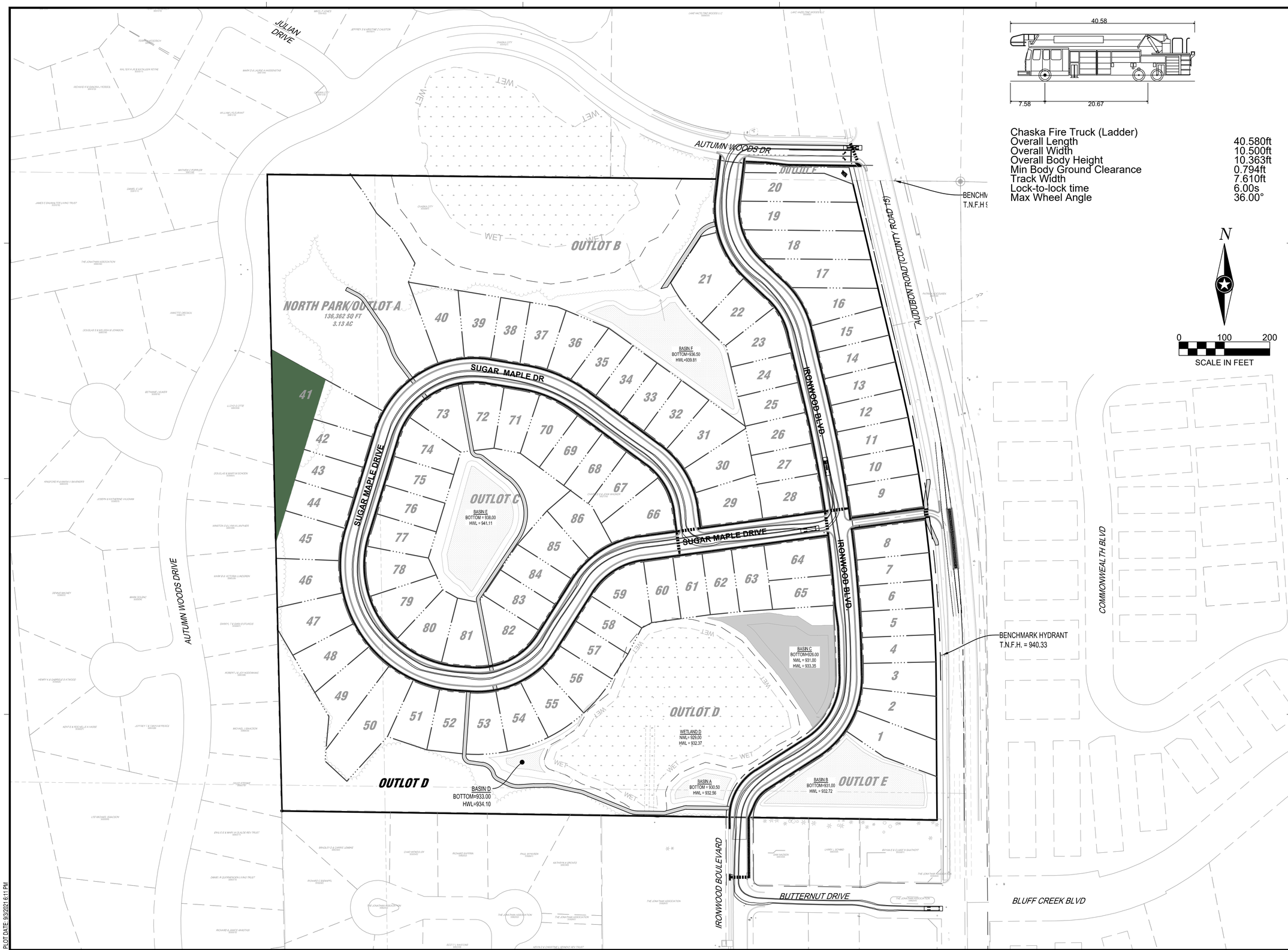
TRAFFIC CONTROL PLAN (SIGNAGE)

SHEET

34

OF 46

PLOT DATE: 9/30/2021 8:05 AM



Chaska Fire Truck (Ladder)	
Overall Length	40.580ft
Overall Width	10.500ft
Overall Body Height	10.363ft
Min Body Ground Clearance	0.794ft
Track Width	7.610ft
Lock-to-lock time	6.00s
Max Wheel Angle	36.00°

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

PROJECT

LENNAR

RESERVE AT AUTUMN WOODS

CHASKA MINNESOTA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

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

TITLE

EMERGENCY VEHICLE ACCESS PLAN

SHEET

35 OF 47

PRELIMINARY NOT FOR CONSTRUCTION

PLOT DATE: 8/3/2021 6:11 PM

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)

SOD	QTY	BOTANICAL / COMMON NAME

CODE REQUIREMENTS SUMMARY

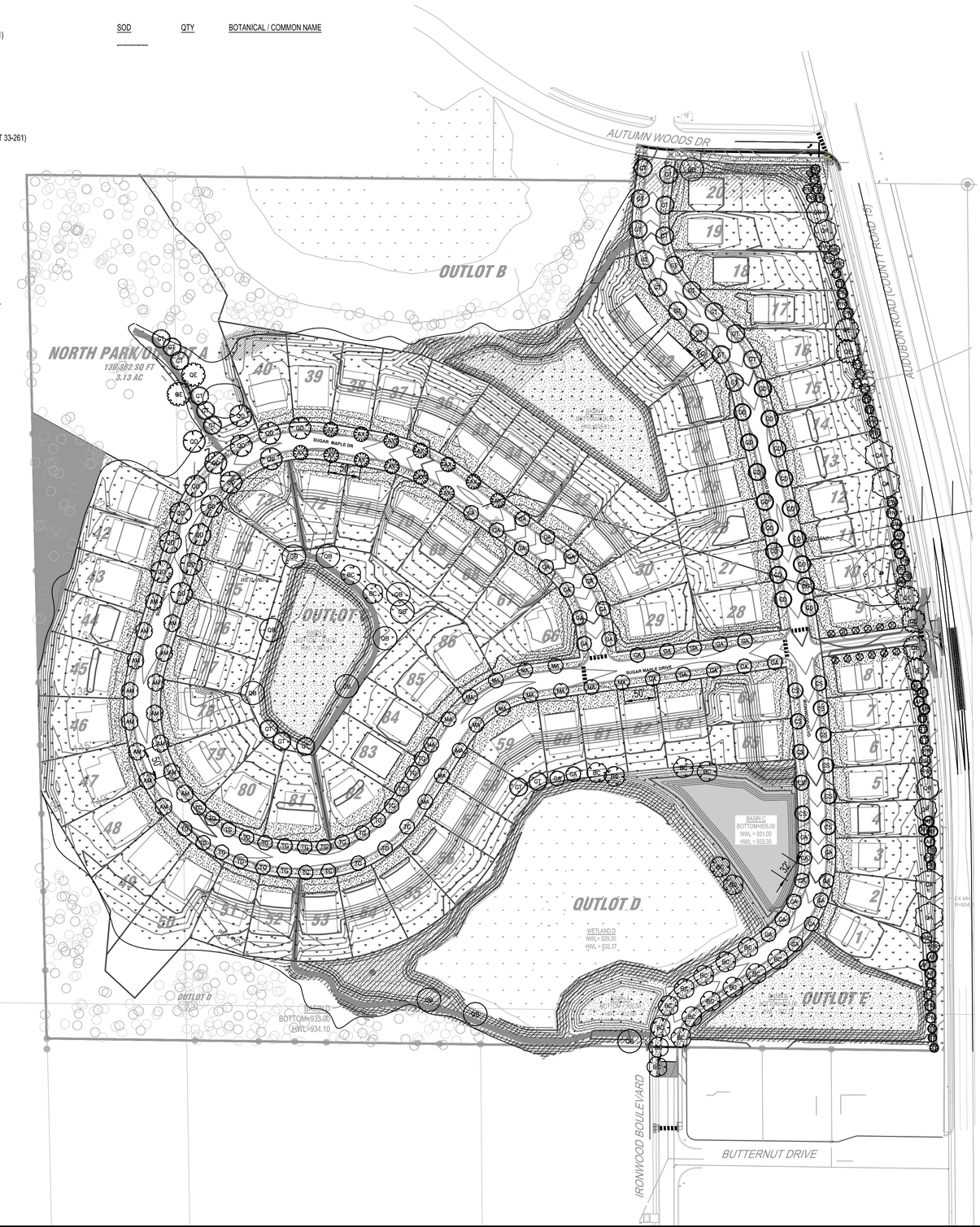
STREET TREES REQUIREMENTS:
1 OVERSTORY TREE ON EACH SIDE OF THE STREET FOR EVERY 50 FEET OF CENTERLINE.
9,370 LF / 50 = (188) TREES
- TREES REQUIRED = 188
- TREES PROVIDED = 188

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
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
QC	12	QUERCUS ROBUR X ALBA 'CRIMSCHMIDT' TM CRIMSON SPIRE OAK	2.5" CAL	B & B
QR	4	QUERCUS RUBRA RED OAK	2.5" CAL	B & B
TG	26	TILIA CORDATA 'GREENSPIRE' GREENSPIRE LITTLELEAF LINDEN	2.5" CAL	B & B

N

0 100 200
SCALE IN FEET

ISG

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.
JERREMY D. FOSS
DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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.	-

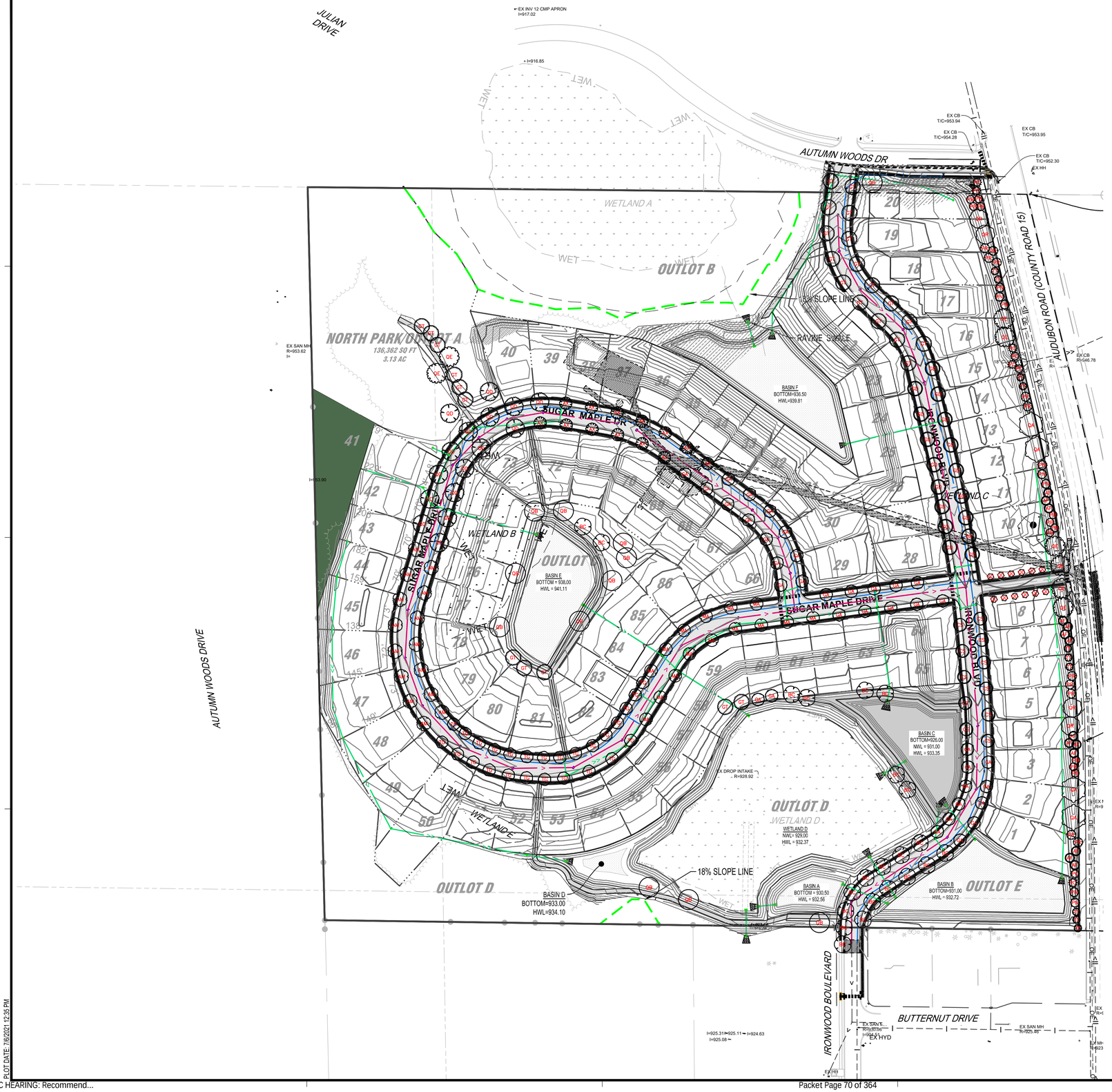
TITLE

RESTORATION AND PLANTING PLAN

SHEET
36
OF 47

PRELIMINARY NOT FOR CONSTRUCTION

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



PLANT 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

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

PROJECT

LENNAR

RESERVE AT AUTUMN WOODS

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)

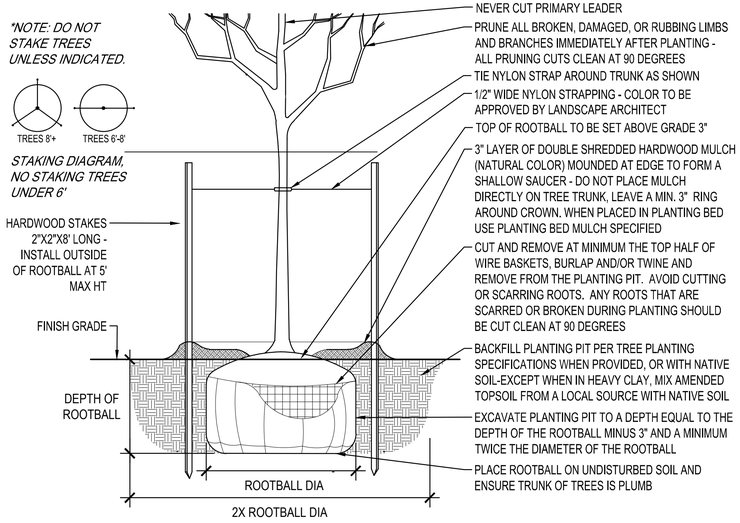
SHEET

37

OF 47

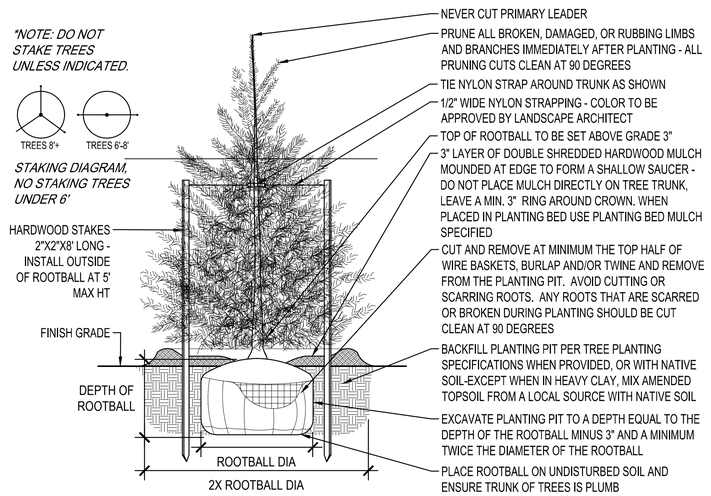
PRELIMINARY NOT FOR CONSTRUCTION

PLOT DATE: 7/6/2021 12:35 PM



DECIDUOUS TREE PLANTING DETAIL

SCALE: 1" = 1'-0

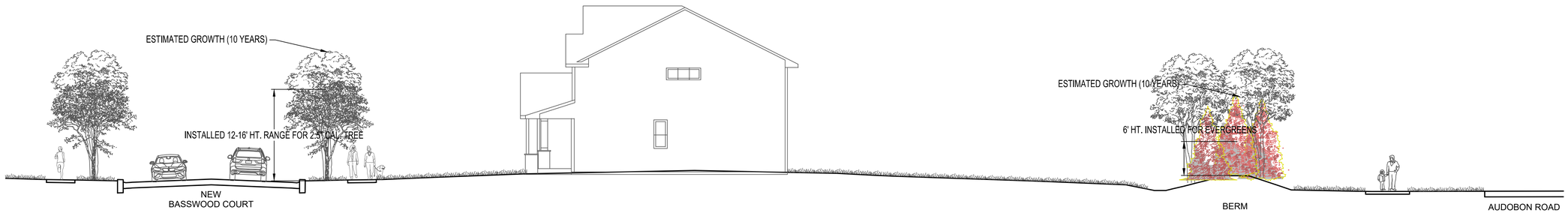


CONIFER / EVERGREEN TREE PLANTING DETAIL

SCALE: 1" = 1'-0

GENERAL PLANTING NOTES

1. 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.
2. SAVE AND PROTECT ALL EXISTING TREES NOT NOTED TO BE REMOVED.
3. REMOVE ALL CONSTRUCTION DEBRIS AND MATERIALS INJURIOUS TO PLANT GROWTH FROM PLANTING PITS AND BEDS PRIOR TO BACKFILLING WITH PLANTING MIX.
4. ANY AREAS OUTSIDE THE LIMIT OF WORK THAT ARE DISTURBED SHALL BE RESTORED TO ITS ORIGINAL CONDITION AT NO ADDITIONAL COST TO OWNER.
5. 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.
6. REFER TO PLANTING DETAILS PLAN FOR AMENDED SOIL DEPTH IN PLANTING BEDS AND SURROUNDING TREES.
7. 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.
8. ALL PLANT MATERIALS SHALL BE TRUE TO THEIR SCIENTIFIC NAME AND SIZE AS INDICATED IN THE PLANT SCHEDULE.
9. 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.
10. OWNER RESERVES THE RIGHT TO REVISE QUANTITIES TO SUIT BUDGET LIMITATIONS. CONTRACTOR'S UNIT BID PRICES SHALL PREVAIL FOR ANY CHANGES IN QUANTITIES.
11. 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.
12. 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.
13. 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.
14. FOR TREES PROVIDE DOUBLE SHREDDED HARDWOOD MULCH RING (NATURAL COLOR) AT 3" DEPTH PER PLANTING DETAILS.
15. ALL TURF AREAS DISTURBED BY CONSTRUCTION SHALL BE SODDED OR SEEDED PER PLANS.



PLOT DATE: 10/1/2021 10:05 AM

PRELIMINARY NOT FOR CONSTRUCTION

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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.	-

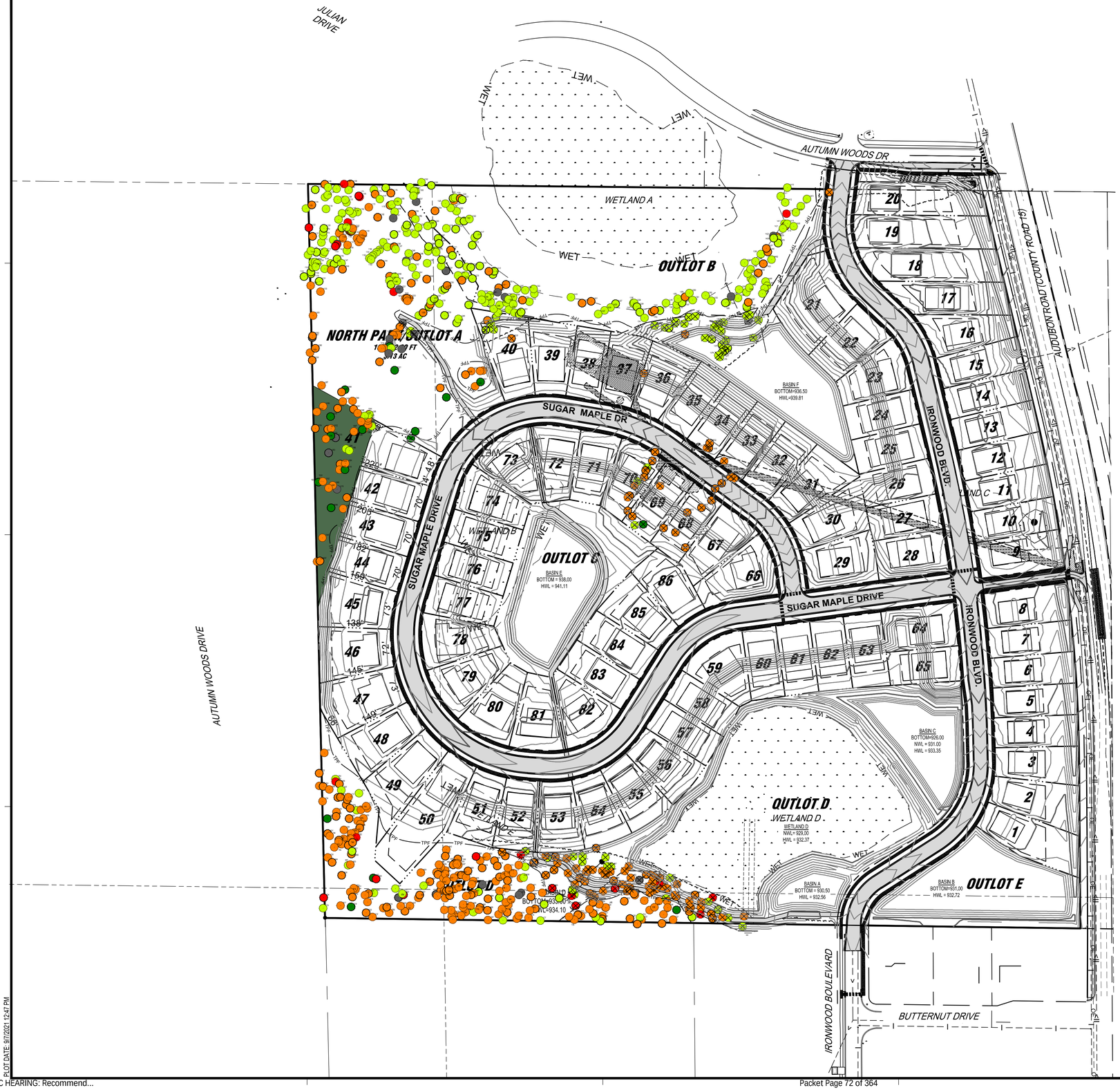
TITLE

PLANTING NOTES AND DETAILS

SHEET

38

OF 47



N

0 100 200

SCALE IN FEET

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

PRELIMINARY NOT FOR CONSTRUCTION

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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.	-

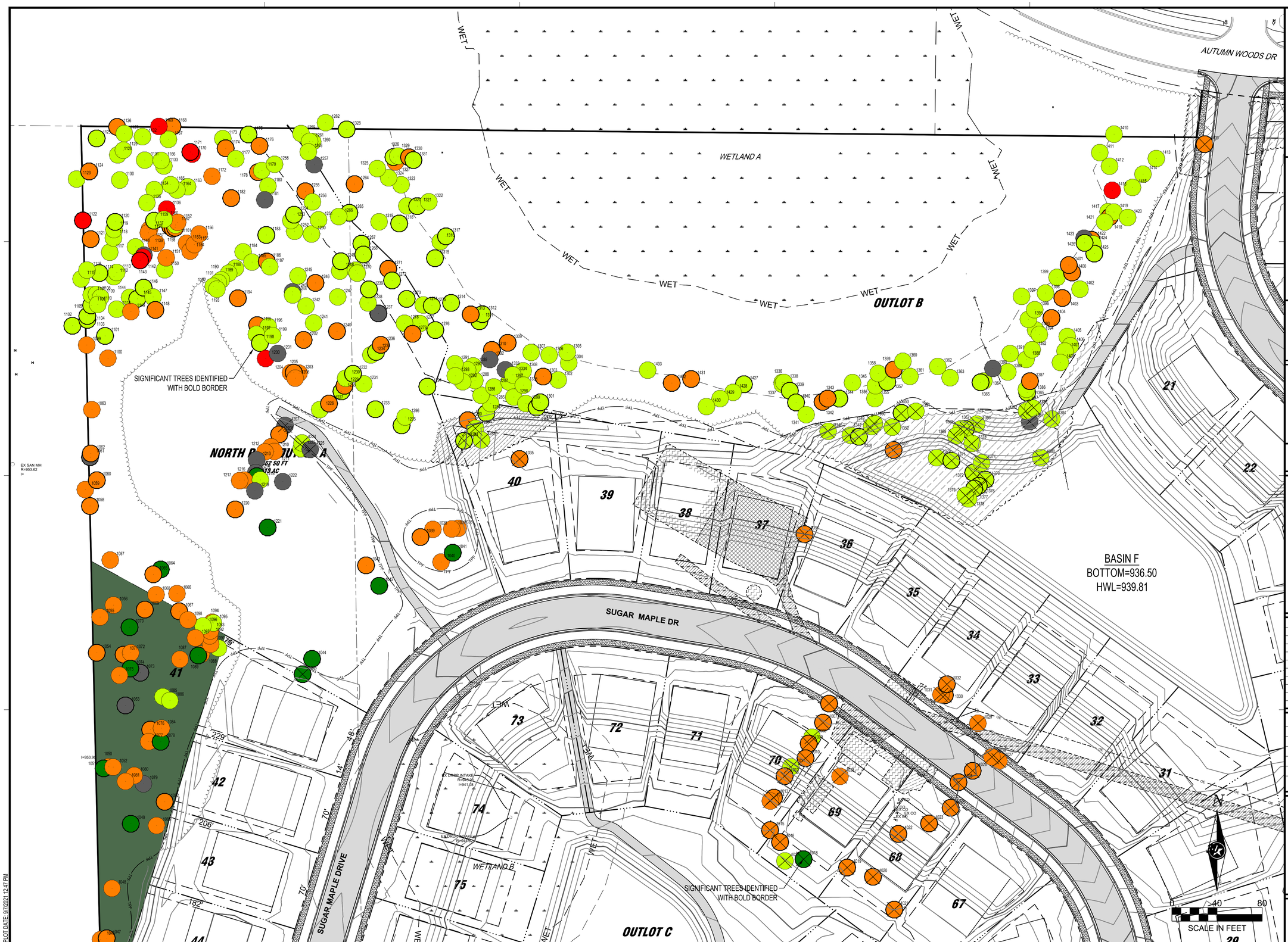
TITLE

OVERALL TREE PRESERVATION

SHEET

39

OF 47



ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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

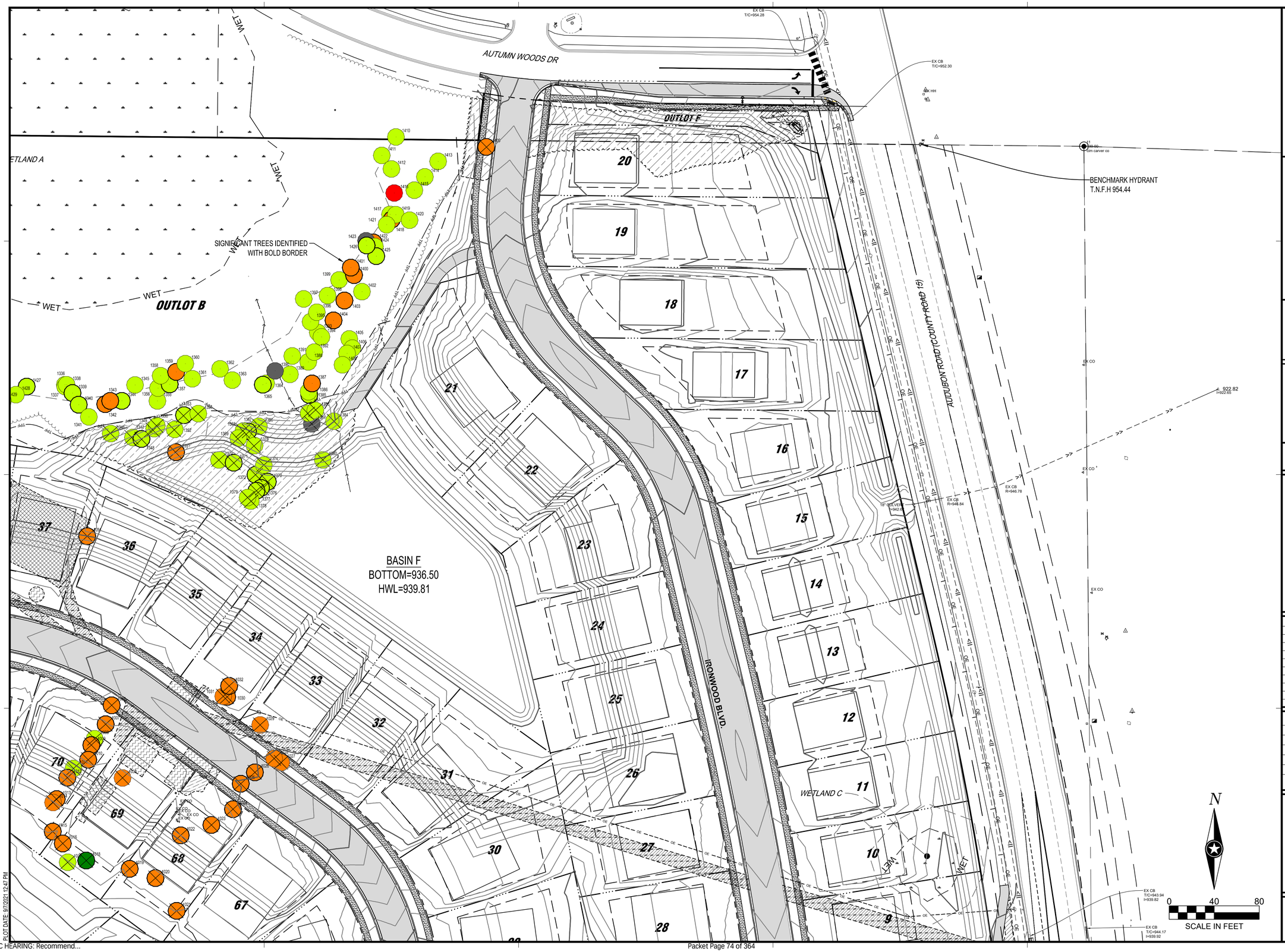
TREE PRESERVATION A

SHEET

40 OF 47

PRELIMINARY NOT FOR CONSTRUCTION

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



PRELIMINARY NOT FOR CONSTRUCTION

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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

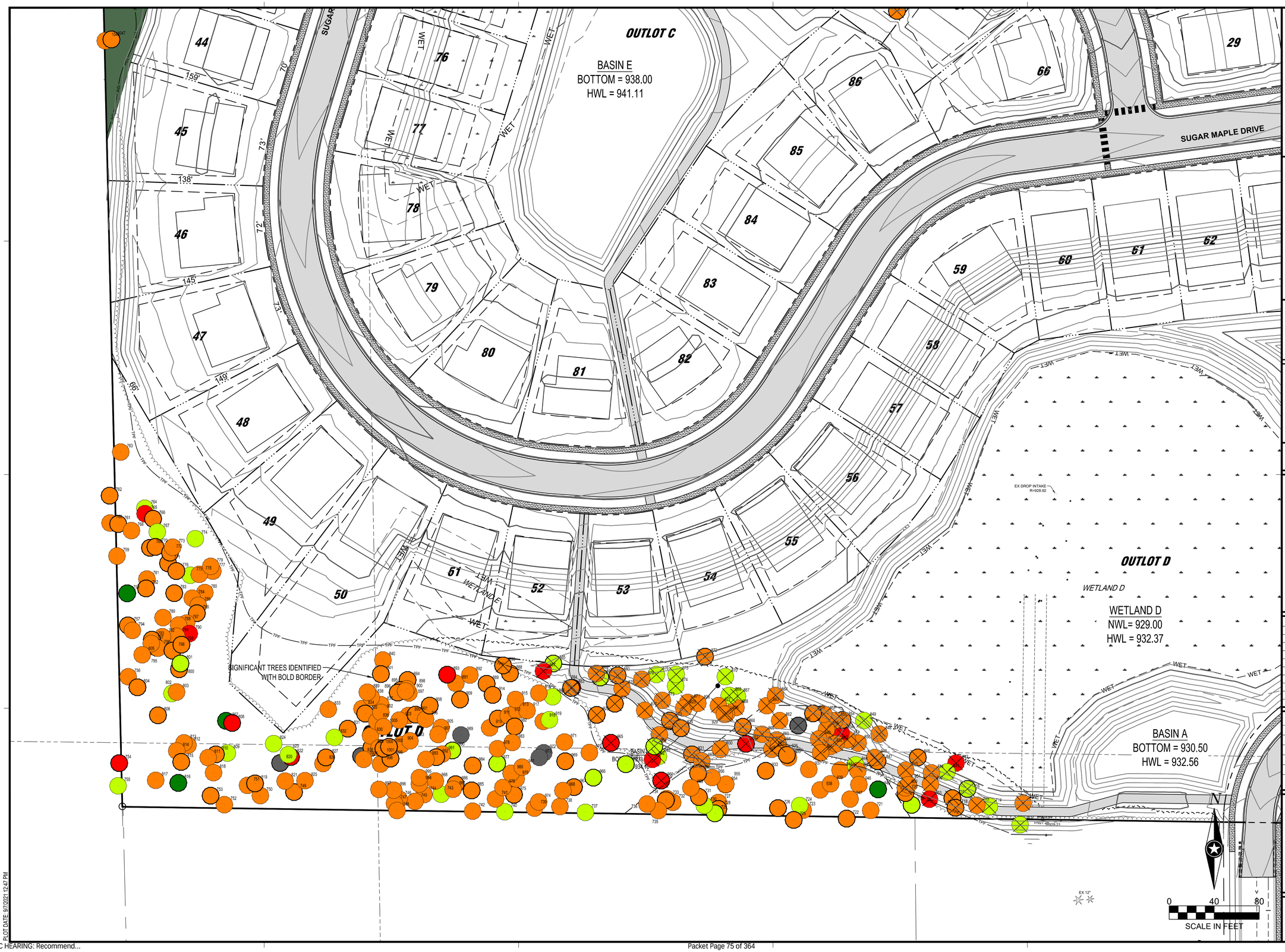
TREE PRESERVATION B

SHEET

41

OF 47

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



ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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

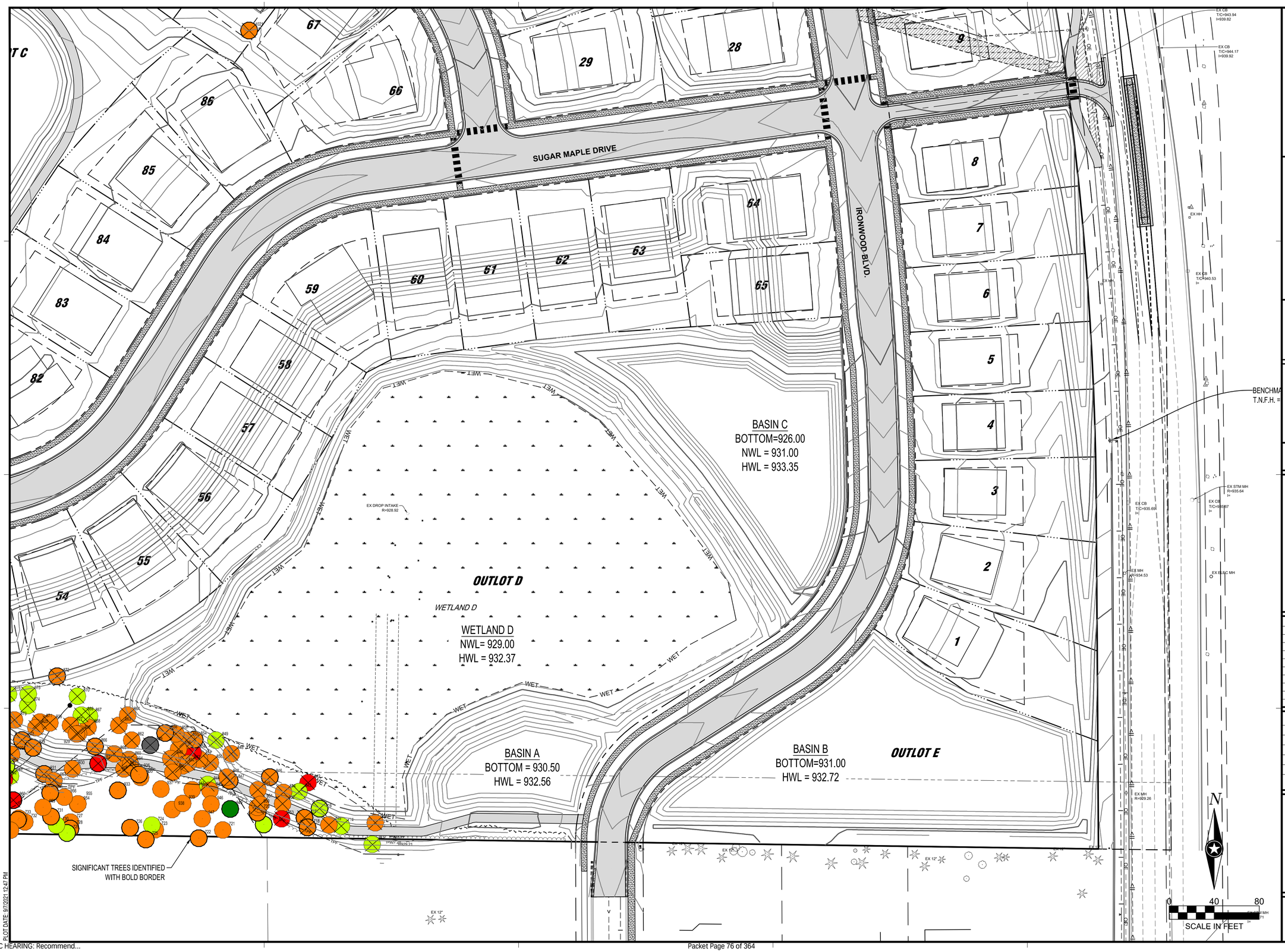
TREE PRESERVATION C

SHEET

42 OF 47

PRELIMINARY NOT FOR CONSTRUCTION

PLOT DATE: 6/7/2021 12:47 PM



PRELIMINARY NOT FOR CONSTRUCTION

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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

PLOT 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

ISG

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.
JERREMY D. FOSS
DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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 A

SHEET

44

OF 47

PRELIMINARY NOT FOR CONSTRUCTION

PLOT 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	

PRELIMINARY NOT FOR CONSTRUCTION

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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 B

SHEET

45

OF 47

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

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

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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

PRELIMINARY NOT FOR CONSTRUCTION

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

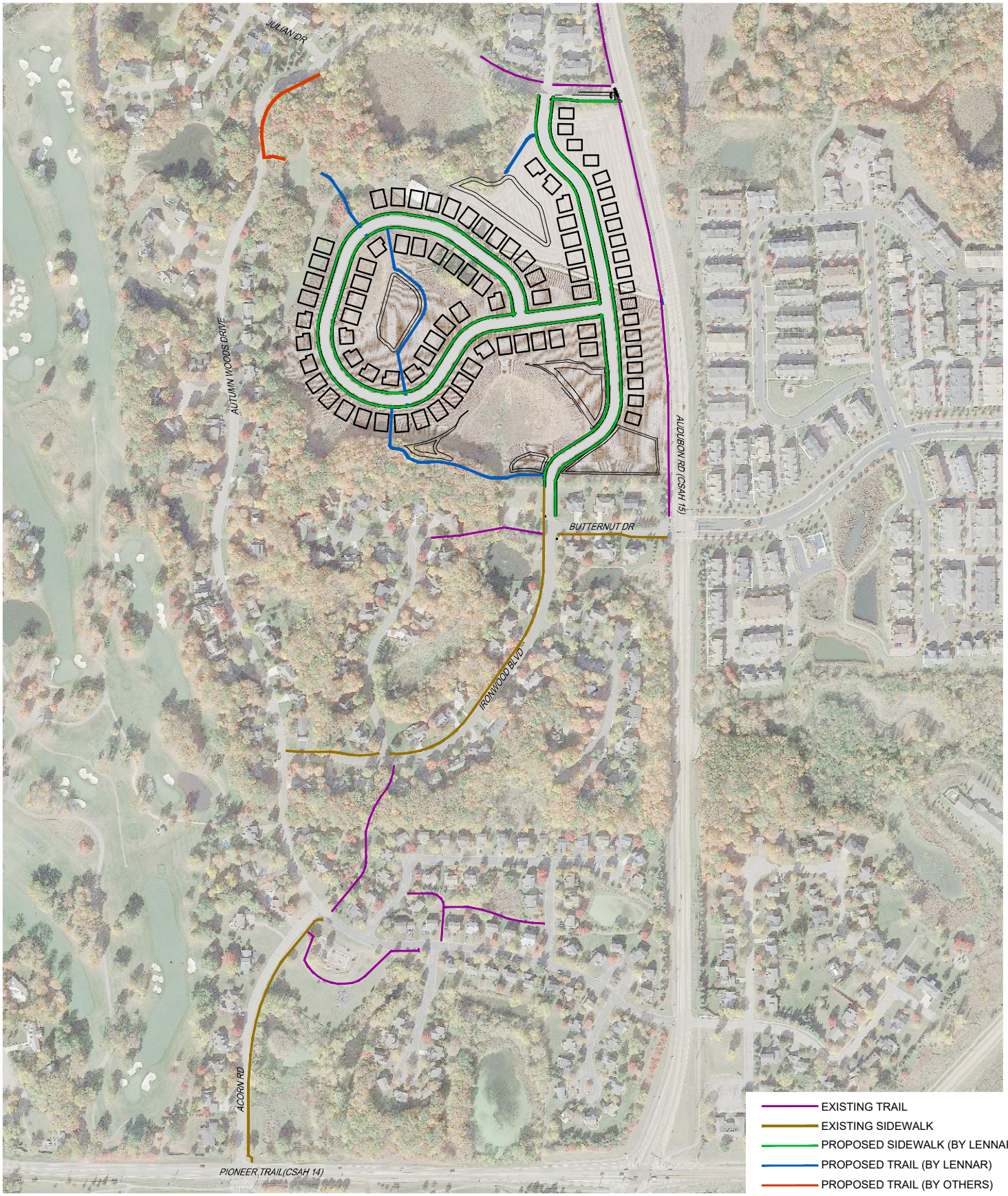


EXHIBIT: EXISTING AND PROPOSED PEDESTRIAN FACILITIES

ISG

Architecture + Engineering + Environmental + Planning

THE RESERVE AT AUTUMN WOODS
Chaska, MN - 09/20/2021
ISG PROJECT NO. 21-24984

CAD FILE NAME: 24984 EXISTING PEDESTRIAN FACILITY MAP

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.

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.

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.

~~~
~~~



INTERSECTION MAP

0 250 500
SCALE: 1" = 500 FEET

ISG
Architecture + Engineering + Environmental + Planning
www.isgmn.com

Lennar Wagner Woods
Chaska, MN - 05/20/2021
ISG PROJECT NO. 2021-24984

CAD FILE NAME: 24984 INTERSECTION EXHIBITS

DRAFT

TRAFFIC IMPACT ANALYSIS - DRAFT

Reserve at Autumn Woods
Chaska, MN

September 3rd, 2021

Project No. 21-24984

ISG
Architecture
Engineering
Environmental
Planning
ISGInc.com

REPORT FOR:
LENNAR HOMES
Josh Metzer
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.

_____

Jerremy 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

TABLE OF CONTENTS

Executive Summary 1
Studied Intersection Description and Location 1
Findings 2
Recommendations 3
Introduction 4
Purpose of Report 4
Study Objectives 4
Existing Conditions 4
Housing Data, Zoning, and Land Use 4
Area Roadway System 5
Existing Traffic Volumes and Analysis Assumptions 7
Proposed Conditions 17
Site Traffic 17
Other Traffic 24
Total Future Traffic 24
Traffic Analysis 25
Capacity and Level of Service at Studied Intersections 25
Crash Analysis 58
Recommendations 59

APPENDICES

Appendix A: Preliminary Site Concept ..... A
Appendix B: Project Location + Roadway Classification Map ..... B
Appendix C: Intersection and Site Configuration Map C
Appendix D: City of Chaska Zoning Map ..... D
Appendix E: Hourly Traffic Volume Counts ..... E
Appendix F: Turning Movement Assignments for Intersection 8 ..... F
Appendix G: Existing (2021) Synchro Analysis Worksheets ..... G
Appendix H: Traffic Distribution ..... H
Appendix I: Intersection 1 Warrant Anlysis I
Appendix J: Existing Shared Use Trail + Sidewalks ..... J
Appendix K: Existing Bus Routes ..... K
Appendix L: Opening (2023) Volumes – Scenarios 1, 2, and 3 L
Appendix M: Opening (2023) Synchro Analysis Worksheets – Scenarios 1, 2, and 3 ..... M
Appendix N: No Build (2023) Volumes ..... N
Appendix O: No Build (2023) Synchro Analysis Worksheets ..... O
Appendix P: Full Build (2043) Volumes – Scenarios 1, 2, and 3 ..... P
Appendix Q: Full Build (2043) Synchro Analysis Worksheets – Scenarios 1, 2, and 3 ..... Q
Appendix R: No Build (2043) Volumes ..... R
Appendix S: No Build (2043) Synchro Analysis Worksheets ..... S
Appendix T: Crash Map ..... T

TABLE OF FIGURES

Figure 1 Carver County within the state of Minnesota. 4
Figure 2 Hour total volumes collected across Intersections 1, 2, 3, 4, and 5 for the study area. 8
Figure 3 Highway Capacity Manual (HCM), 2016 Signalized Intersection LOS. 12
Figure 4 Highway Capacity Manual (HCM), 2016 Unsignalized Intersection LOS. 12
Figure 5 Historical AADT volumes along the county roadways 13
Figure 6 Historical growth along the county roadways 14
Figure 7 Historical and forecasted traffic growth along Audubon Road (CSAH 15) 14
Figure 8 Historical and forecasted traffic growth along Dakota Avenue S. 15
Figure 9 Warrant 2, four hour volume plot for Intersection 1. 23
Figure 10 Warrant 3, peak hour for Intersection 1. 23

TABLE OF TABLES

Table 1 ITE Trip Generation for the Proposed Development. 7
Table 2 Intersection 1 Existing (2021) LOS and delay. 9
Table 3 Intersection 2 Existing (2021) LOS and delay. 9
Table 4 Intersection 3 Existing (2021) LOS and delay. 10
Table 5 Intersection 4 Existing (2021) LOS and delay. 10
Table 6 Intersection 5 Existing (2021) LOS and delay. 11
Table 7 Intersection 8 Existing (2021) LOS and delay. 11
Table 8 PM Peak Hour Trip Generation of the Proposed Residential Development. 17
Table 9 Trip Assignments evaulated within the performed Sensitivity Analysis. 20
Table 10 Warrant Analysis summary for Intersection 1. 22
Table 11 Intersection 1 Opening (2023) LOS and delay for Scenarios , 2, and 3. 26
Table 12 Intersection 2 Opening (2023) LOS and delay for Scenarios , 2, and 3. 27
Table 13 Intersection 3 Opening (2023) LOS and delay for Scenarios , 2, and 3. 28
Table 14 Intersection 4 Opening (2023) LOS and delay for Scenarios , 2, and 3. 29
Table 15 Intersection 5 Opening (2023) LOS and delay for Scenarios , 2, and 3. 30
Table 16 Intersection 6 Opening (2023) LOS and delay for Scenarios , 2, and 3. 31
Table 17 Intersection 7 Opening (2023) LOS and delay for Scenarios , 2, and 3. 32
Table 18 Intersection 8 Opening (2023) LOS and delay for Scenarios , 2, and 3. 33
Table 19 Intersection 1 No Build (2023) LOS and delay. 34
Table 20 Intersection 2 No Build (2023) LOS and delay. 34
Table 21 Intersection 3 No Build (2023) LOS and delay. 35
Table 22 Intersection 4 No Build (2023) LOS and delay. 35
Table 23 Intersection 5 No Build (2023) LOS and delay. 36
Table 24 Intersection 8 No Build (2023) LOS and delay. 36
Table 25 Intersection 1 Full Build (2043) LOS and delay for Scenarios 1, 2, and 3. 37
Table 26 Intersection 2 Full Build (2043) LOS and delay for Scenarios 1, 2, and 3. 38
Table 27 Intersection 3 Full Build (2043) LOS and delay for Scenarios , 2, and 3. 39
Table 28 Intersection 4 Full Build (2043) LOS and delay for Scenarios , 2, and 3. 40
Table 29 Intersection 5 Full Build (2043) LOS and delay for Scenarios , 2, and 3. 41
Table 30 Intersection 6 Full Build (2043) LOS and delay for Scenarios , 2, and 3. 42
Table 31 Intersection 7 Full Build (2043) LOS and delay for Scenarios , 2, and 3. 43
Table 32 Intersection 8 Full Build (2043) LOS and delay for Scenarios , 2, and 3. 44
Table 33 Intersection 1 No Build (2043) LOS and delay. 45
Table 34 Intersection 2 No Build (2043) LOS and delay. 45
Table 35 Intersection 3 No Build (2043) LOS and delay. 46
Table 36 Intersection 4 No Build (2043) LOS and delay. 46
Table 37 Intersection 5 No Build (2043) LOS and delay. 47
Table 38 Intersection 8 No Build (2043) LOS and delay. 47

Table 39 Intersection 1 Comparison Tables. 48
Table 40 Intersection 2 Comparison Tables. 49
Table 41 Intersection 3 Comparison Tables. 50
Table 42 Intersection 4 Comparison Tables. 51
Table 43 Intersection 5 Comparison Tables. 52
Table 44 Intersection 6 No Build (2043) LOS and delay. 53
Table 45 Intersection 7 No Build (2043) LOS and delay. 54
Table 46 Intersection 8 Comparison Tables. 55

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

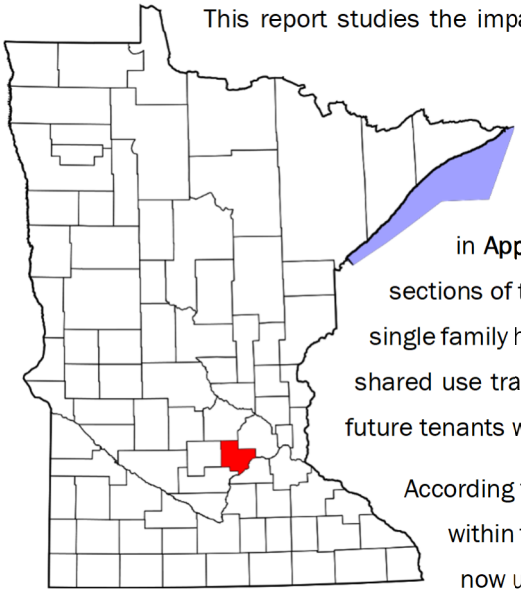


Figure 1 Carver County within the state of Minnesota.

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, Butternut 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 additional 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	R^2	# 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	0.92	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	0.89	157
Weekday	ln(T) = 0.92 ln(X)+2.71	915	50%	50%	457	458	0%	0%	100%	0	0	0	0	457	458	2.1	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.

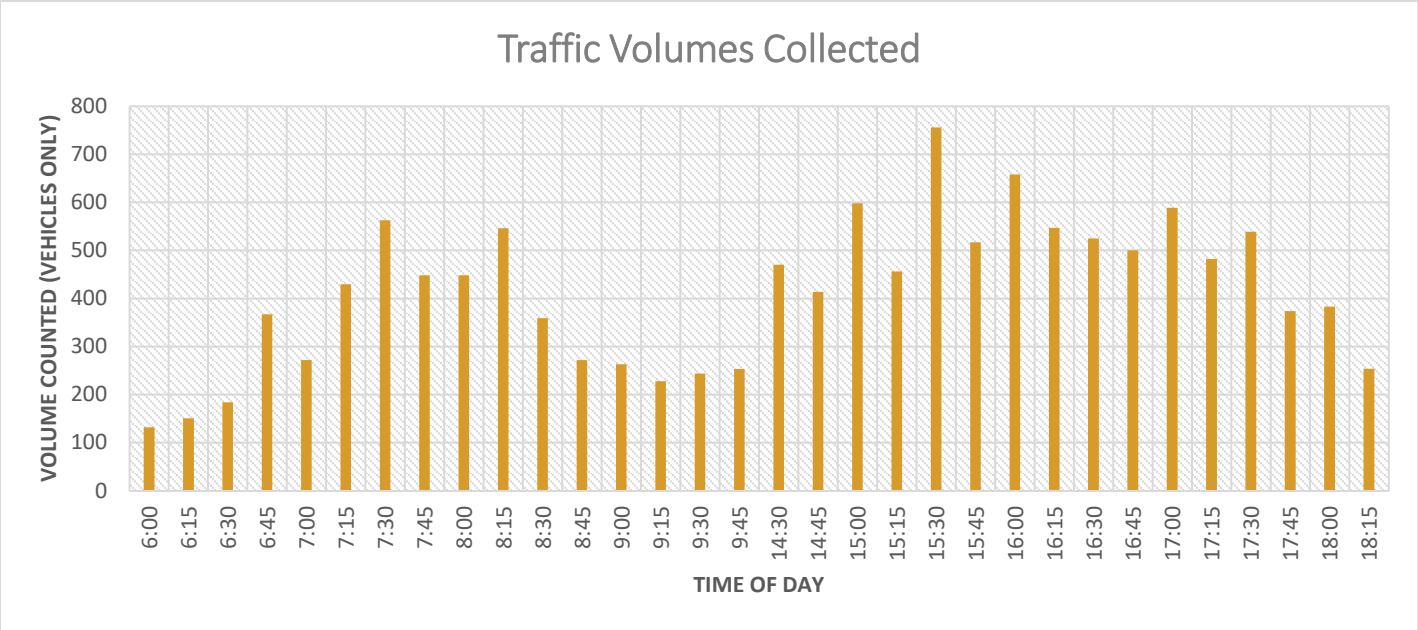


Figure 2 Hour total volumes collected across Intersections 1, 2, 3, 4, and 5 for the study area.

Additional coordination was completed with the County and City, including but not limited to:

- Obtaining existing signal timing information for Intersections 2 and 8 from the County. A copy of the signal timing can be provided upon request. The signal information entered within the study is based on controller timing plan 1 for both intersections, matching minimum green, walk, pedestrian clear, vehicle extension, yellow, and red clear time.
- Coordination with the local school district to obtain existing bus routes through the existing Autumn Woods Drive development. Exhibits and discussion on the routes are within the **Modal Split** section of this Report.
- Utilizing the 48-hr traffic volume that were performed by the City, conducted on the 24th and 25th of May.

To analyze the traffic conditions within the study area, Synchro version 11's Synchro Control Delay (Percentile Method) and the Highway Capacity Manual 6th Edition delay methods were utilized for this report. Intersections 1-8 were modeled. The resulting Synchro analysis worksheets were prepared for the existing conditions (Intersections 6 and 7 are not included within the existing tables as they will be a result of the proposed development) and are provided in **Appendix G. Tables 2 – 7** show the existing level of service (LOS) and delay for Intersection 1, 2, 3, 4, 5 and 8 for PM Peak Hour period of 4:30 PM – 5:30 PM. See the **Level of Service and Delay Comparison** section for discussion on level of service and delay.

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												
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	0.0	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

on the results discussed, a signal warrant analysis and turn lane warrant analysis were performed for Intersection 1. The process and results will be discussed in the Proposed Conditions of the Report.

ROADWAY HISTORICAL GROWTH RATE

The growth rate was back-calculated using the historical traffic counts along Audubon Road (CSAH 15) and Pioneer Trail (CSAH 14) in the study area using the following equation:

$$F = C(1+i)^n$$
$$where: C = the\ current\ AADT$$
$$F = the\ future\ AADT$$
$$i = percent\ growth\ in\ decimal\ form$$
$$n = number\ of\ years\ between\ C\ and\ F$$

The historical AADT (**Figures 5** and **6**) were utilized to forecast future AADT volumes to year 2043, 20 years from the opening of the Reserve at Autumn Woods (denoted as "Full Build"). In the past 15 years, traffic volumes on Audubon Road (CSAH 15) and Pioneer Trail (CSAH 14) have decreased. This decrease is most likely the result of the reconstruction of Pioneer Trail (CSAH 14) from Audubon Road (CSAH 15) to Homestead Lane. In addition, State Highway 212 was constructed within this timeframe, between 2006-2008. There is a drop in traffic volumes after the completed construction.

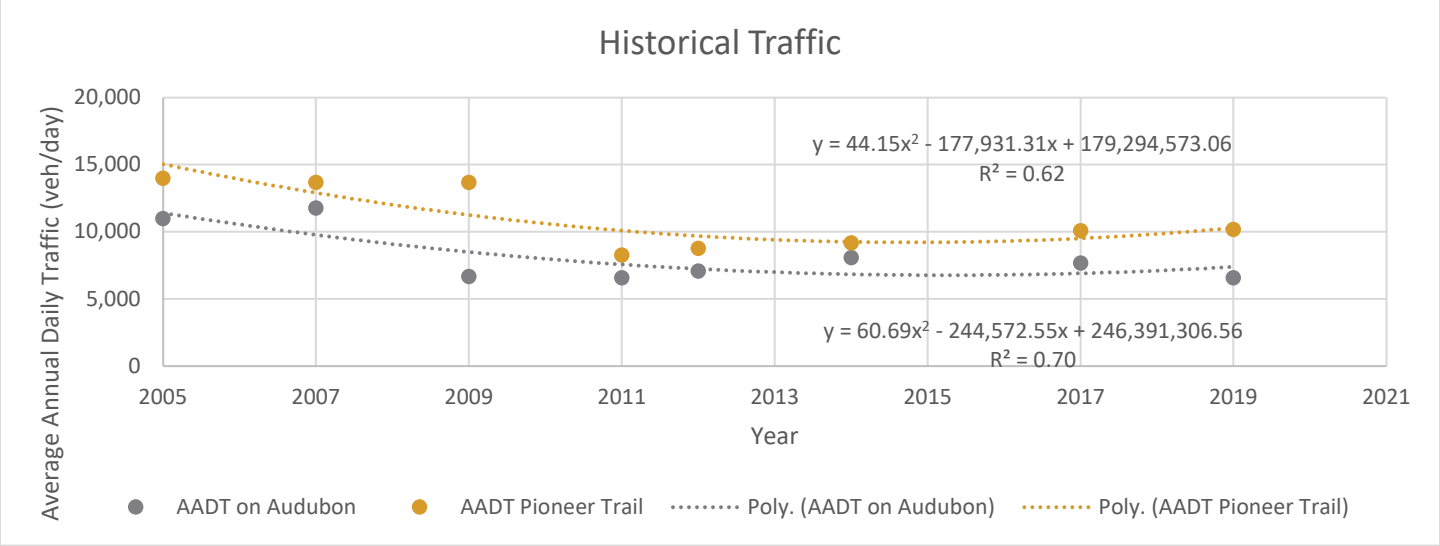


Figure 5 Historical AADT volumes along the county roadways.

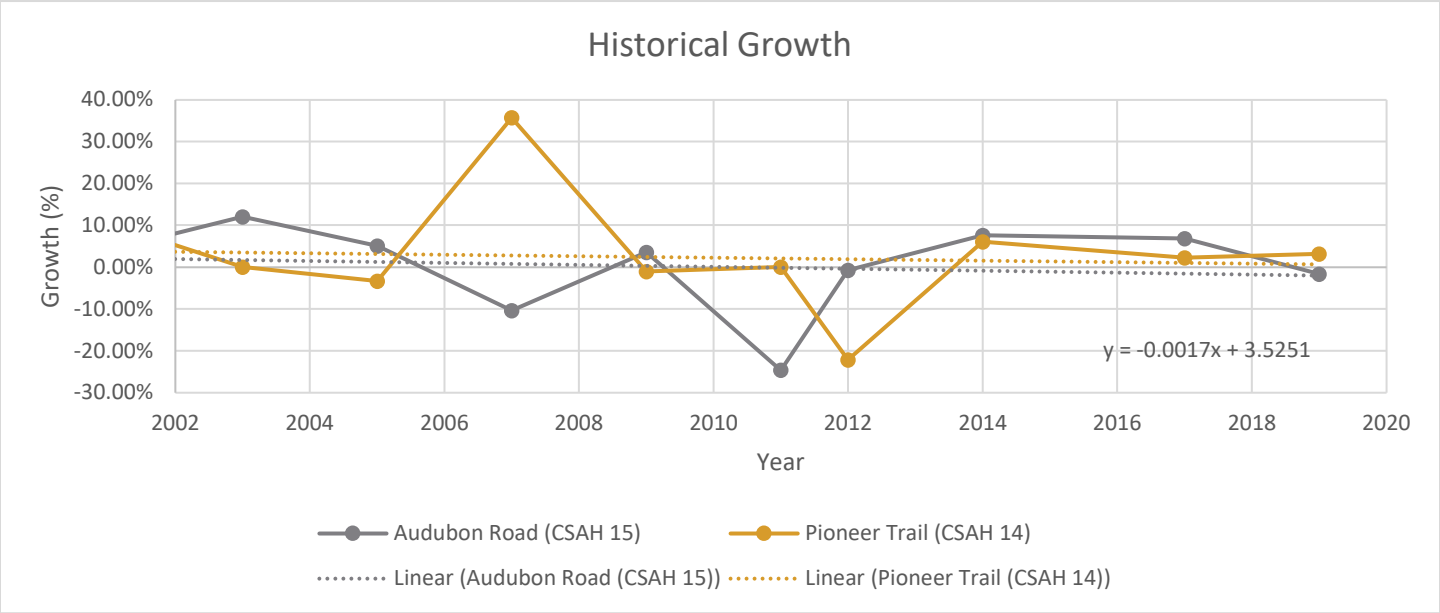


Figure 6 Historical growth along county roadways.

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).

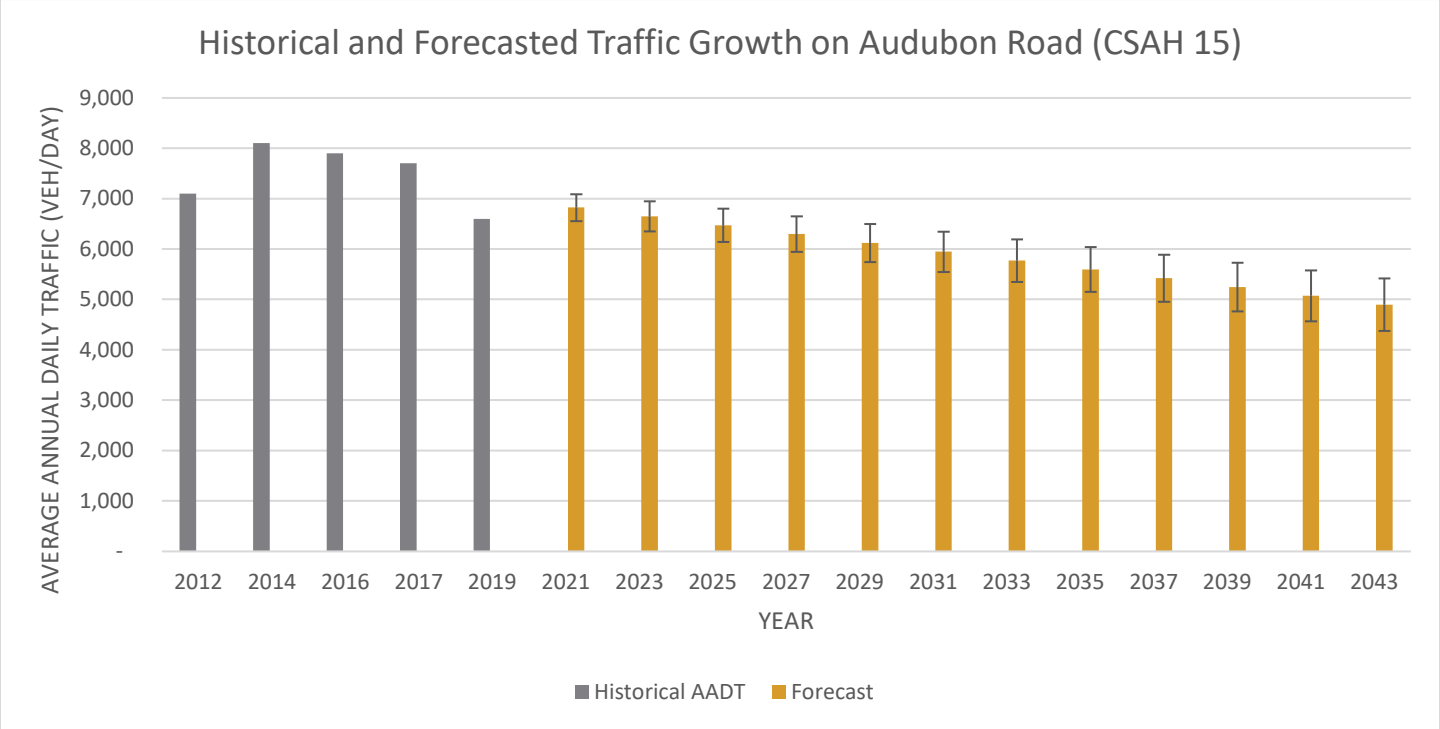


Figure 7 Historical and forecasted traffic growth along Audubon Road (CSAH 15).

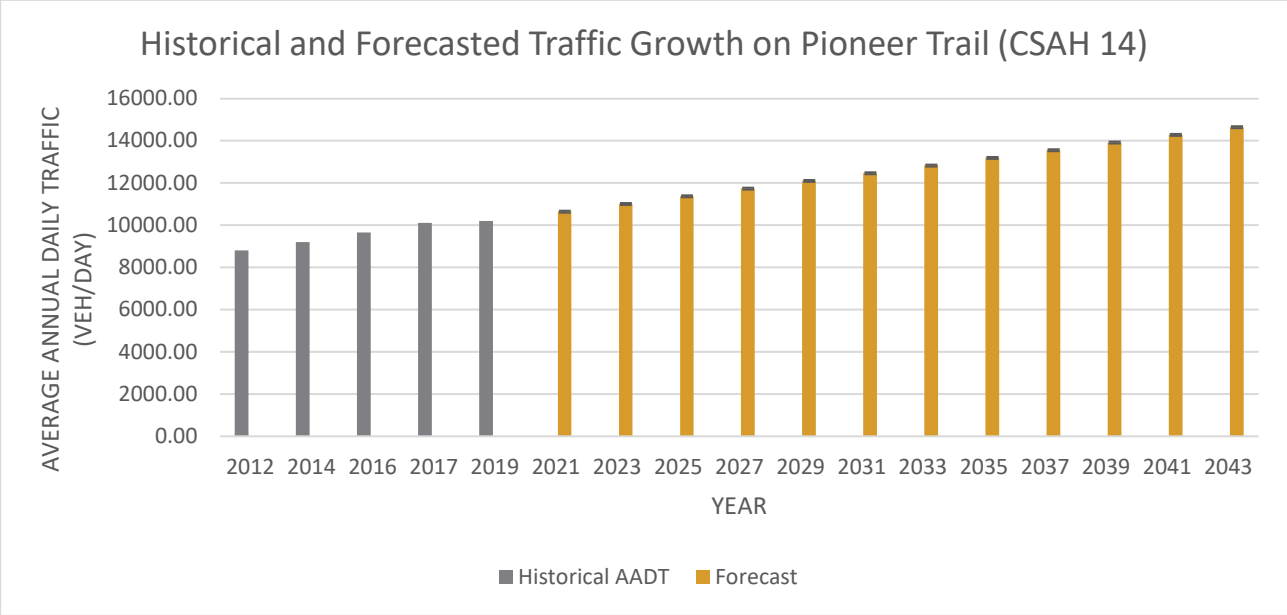


Figure 8 Historical and forecasted traffic growth along Dakota Avenue S.

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 evaulated 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.

WARRANT ANALYSIS

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.

At the time of the traffic counts, a continuous 13-hourly volume count was not performed by ISG nor the City. Utilizing the 8 hours of traffic volume collected, the additional traffic volume was approximated based on a typical traffic volume pattern and the data collected. For a signal to be warranted the intersection is evaluated via 9 warrants listed within the MnMUTCD, the full warrant analysis is provided in **Appendix I**. A summary table of the results are found within **Table 8**.

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.

Table 10 Warrant Analysis summary for Intersection 1.

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.

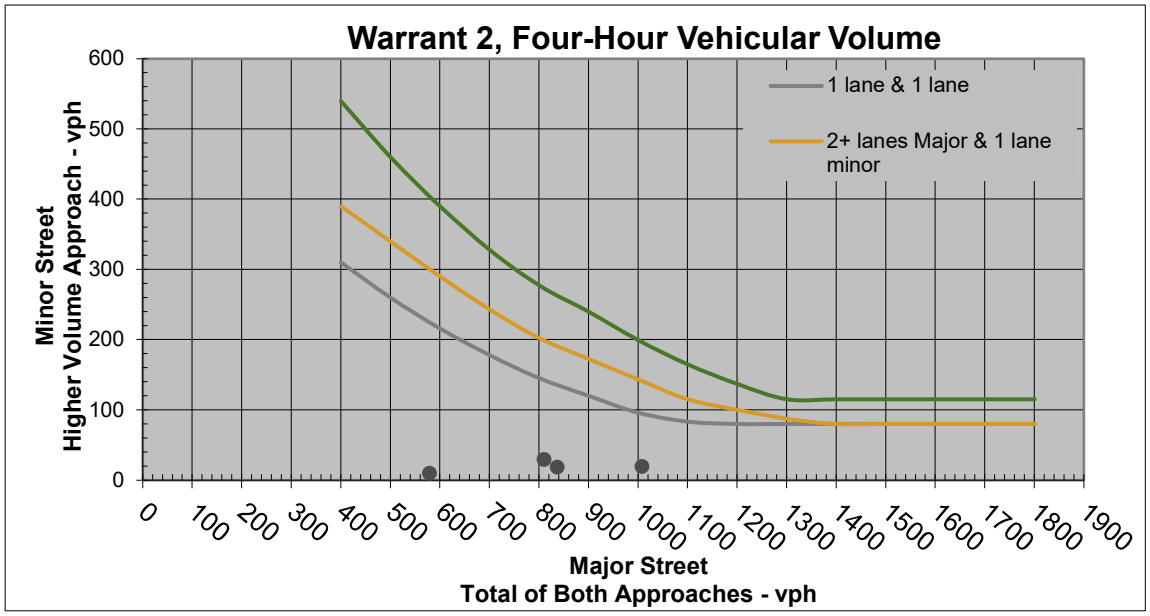


Figure 9 Warrant 2, four hour volume plot for Intersection 1.

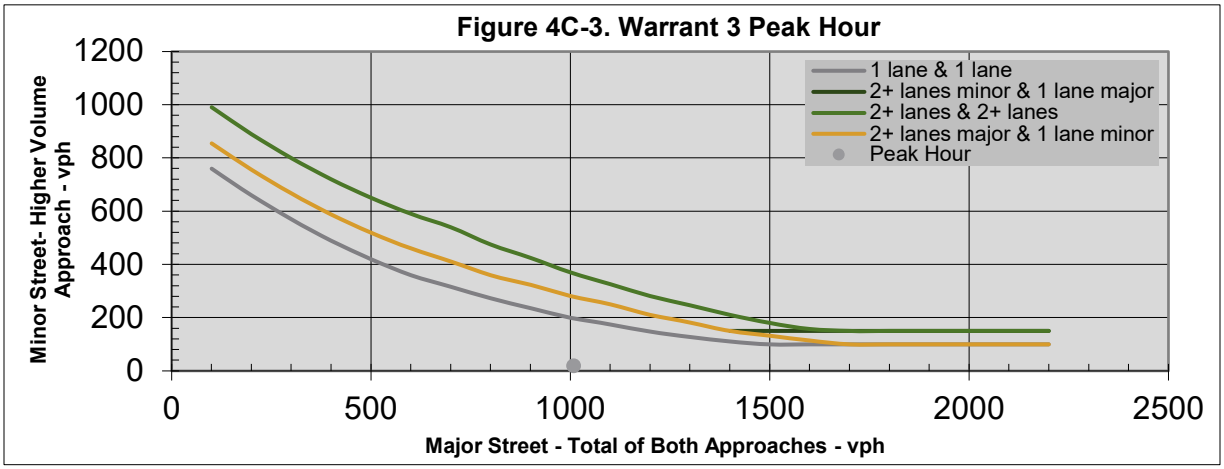


Figure 10 Warrant 3, peak hour for Intersection 1.

7.A. PUBLIC HEARING: Recommend... Packet Page 113 of...
Page 108 of...

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												
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				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												
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		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												
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	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												
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)		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												
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)		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												
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	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													
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		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													
Ironwood Blvd. & Autumn Woods Dr.	Overall	Eastbound			Westbound			Northbound			Southbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
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													
Ironwood Blvd. & Autumn Woods Dr.	Overall	Eastbound			Westbound			Northbound			Southbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)					12		3		13	18	3	17		
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													
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		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												
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	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												
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).
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												
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	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												
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)		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												
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			0.0			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												
Butternut Dr. & Ironwood Blvd.	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
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												
Butternut Dr. & Ironwood Blvd.	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
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												
Ironwood Blvd. & Autumn Woods Dr.	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												
Ironwood Blvd. & Autumn Woods Dr.	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												
Ironwood Blvd. & Autumn Woods Dr.	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												
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	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												
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	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													
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			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													
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	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												
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	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												
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 31 Intersection 7 Full Build (2043) LOS and delay for Scenarios , 2, and 3.

INTERSECTION 8	PM PEAK - SCENARIO 1													
	2043 FULL 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)		22	562	23	31	438	26	10	0	17	15	1	25	
Queue (ft)		36	243	36	40	146	21	0		26	29			
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													
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)		22	562	23	31	438	26	10	0	17	15	1	26	
Queue (ft)		52	290	36	41	191	13	26		15	29			
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													
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)		22	562	23	31	438	26	10	0	17	15	1	26	
Queue (ft)		163	250	48	34	260	17	27		21	28			
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												
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)		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	PM PEAK												
	Autumn Woods Dr. & 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)**	**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	PM PEAK												
	Butternut Dr. & Ironwood Blvd.	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	PM PEAK												
	Ironwood Blvd. & Autumn Woods Dr.	Overall	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)**	**4.9**		0.0			7.3			0.0			0.0	
	LOS	**A**		A			A			A			A	
Scenario 2 (2023)	**Delay (sec)**	**4.7**		0.0			7.3			0.0			0.0	
	LOS	**A**		A			A			A			A	
Scenario 3 (2023)	**Delay (sec)**	**4.6**		0.0			7.3			0.0			0.0	
	LOS	**A**		A			A			A			A	
No Build (2023)	**Delay (sec)**													
	LOS													
Scenario 1 (2043)	**Delay (sec)**	**4.6**		0.0			7.3			0.0			0.0	
	LOS	**A**		A			A			A			A	
Scenario 2 (2043)	**Delay (sec)**	**4.7**		0.0			7.3			0.0			0.0	
	LOS	**A**		A			A			A			A	
Scenario 3 (2043)	**Delay (sec)**	**4.6**		0.0			7.3			0.0			0.0	
	LOS	**A**		A			A			A			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)**	**0.1**		14.5			0.0			0.0			0.0	
	LOS	**A**		B			0.0			A			A	
Scenario 2 (2023)	**Delay (sec)**	**0.1**		14.4			0.0			0.0			0.0	
	LOS	**A**		B			0.0			A			A	
Scenario 3 (2023)	**Delay (sec)**													
	LOS													
No Build (2023)	**Delay (sec)**													
	LOS													
Scenario 1 (2043)	**Delay (sec)**	**0.1**		18.1			0.0			0.0			0.0	
	LOS	**A**		C			0.0			A			A	
Scenario 2 (2043)	**Delay (sec)**	**0.1**		18.1			0.0			0.0			0.0	
	LOS	**A**		C			0.0			A			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.

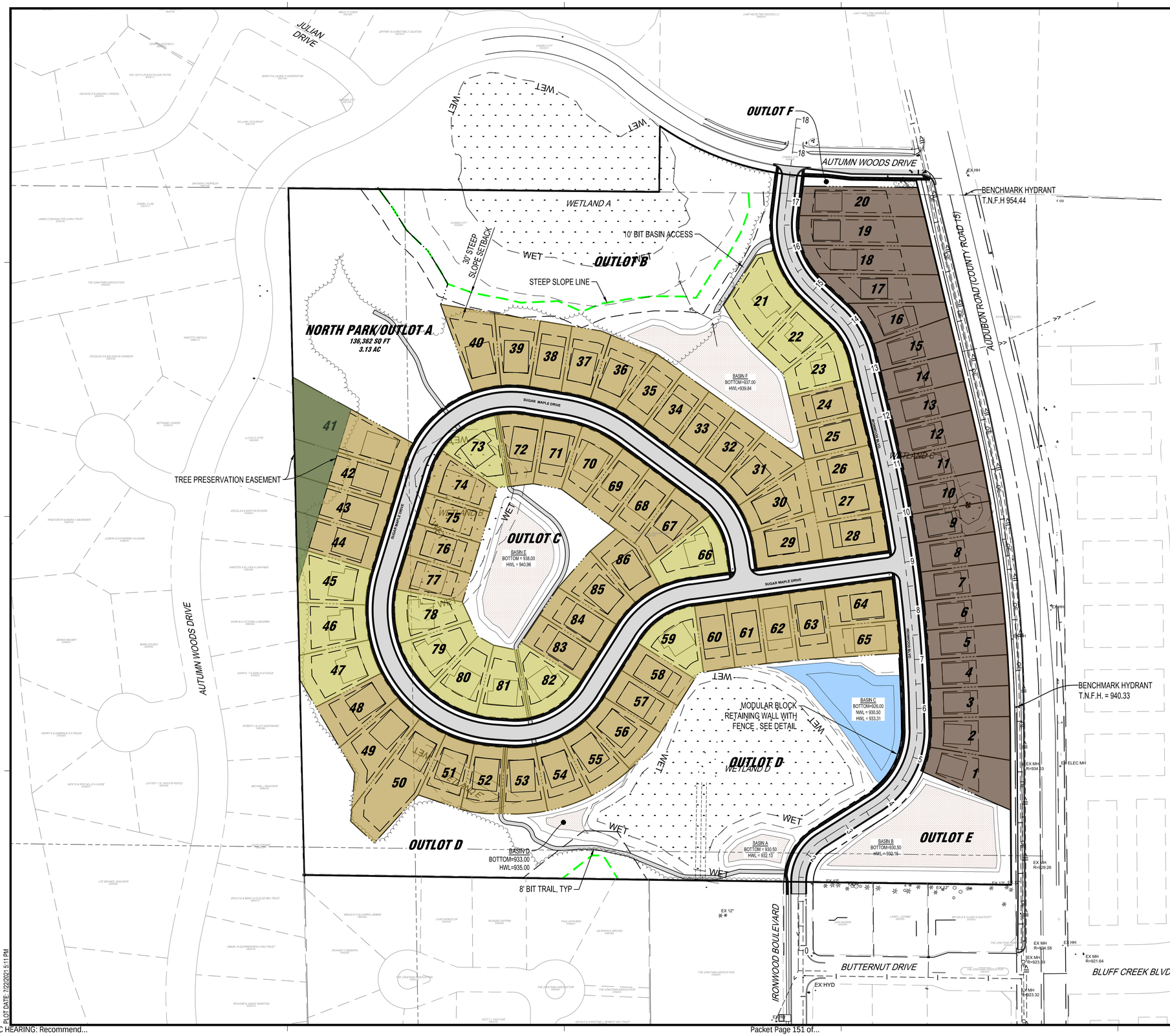
RECOMMENDATIONS

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

7.A. PUBLIC HEARING: Recommend... Packet Page 150 of...



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

ISG

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.

JERREMY D. FOSS

DATE _____ LIC. NO. 55871

THIS DOCUMENT IS THE PROPERTY OF I & S GROUP, INC. AND MAY NOT BE USED, COPIED OR DUPLICATED WITHOUT PRIOR WRITTEN CONSENT.

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.	-

TITLE

OVERALL SITE PLAN

SHEET

17 OF 39

PRELIMINARY NOT FOR CONSTRUCTION

PLOT DATE: 7/22/2021 5:11 PM

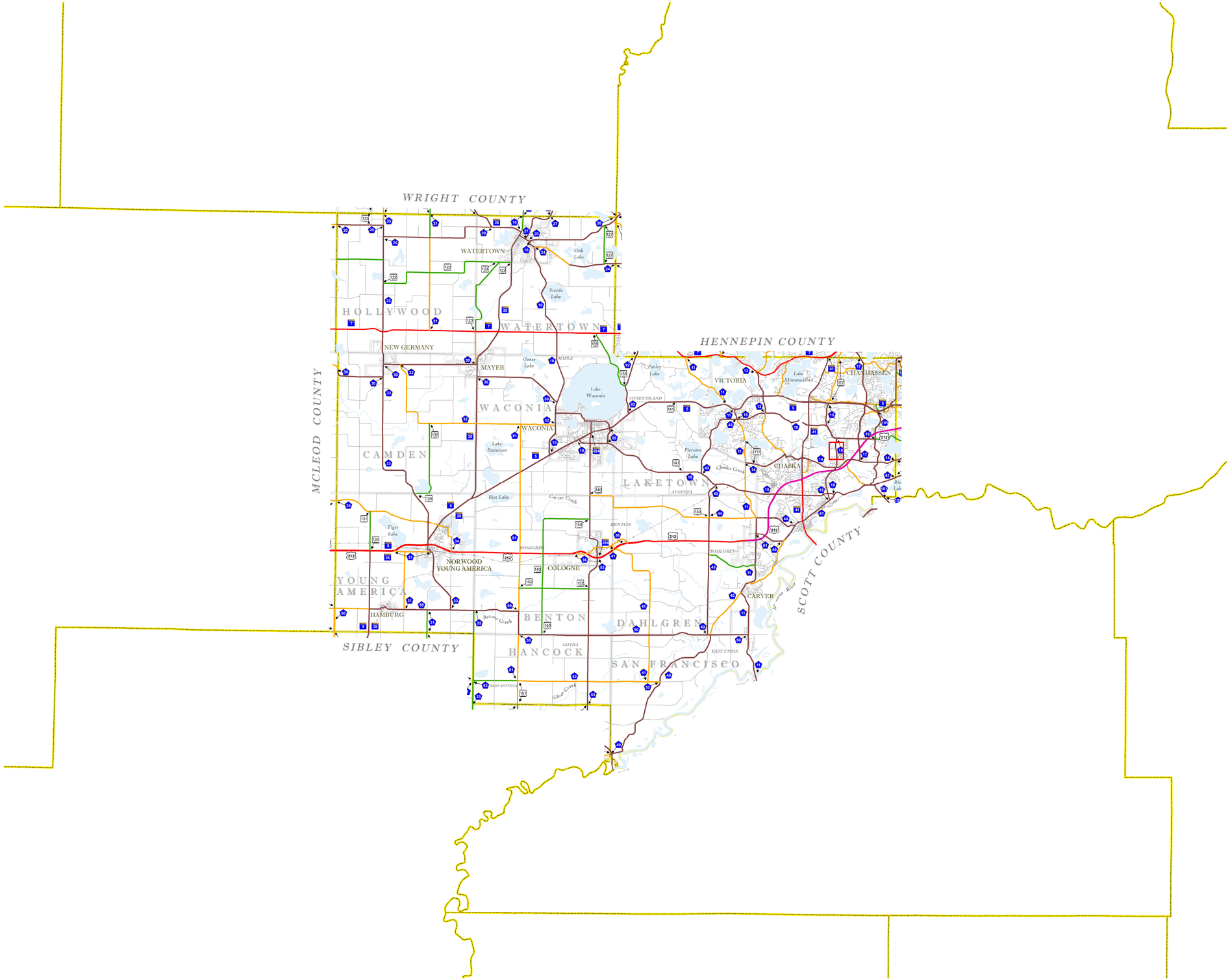
Appendix B: Project Location + Roadway Classification Map

7.A. PUBLIC HEARING: Recommend... Packet Page 152 of...
Page 147 of...

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

2 1 0 2 4 6 8 Miles

0 1.5 3 6 9 12 Kilometers

1 in = 10,560 ft

DECEMBER 2020

Projection:
Transverse Mercator
NAD 1986
UTM Zone 15

N W E S

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

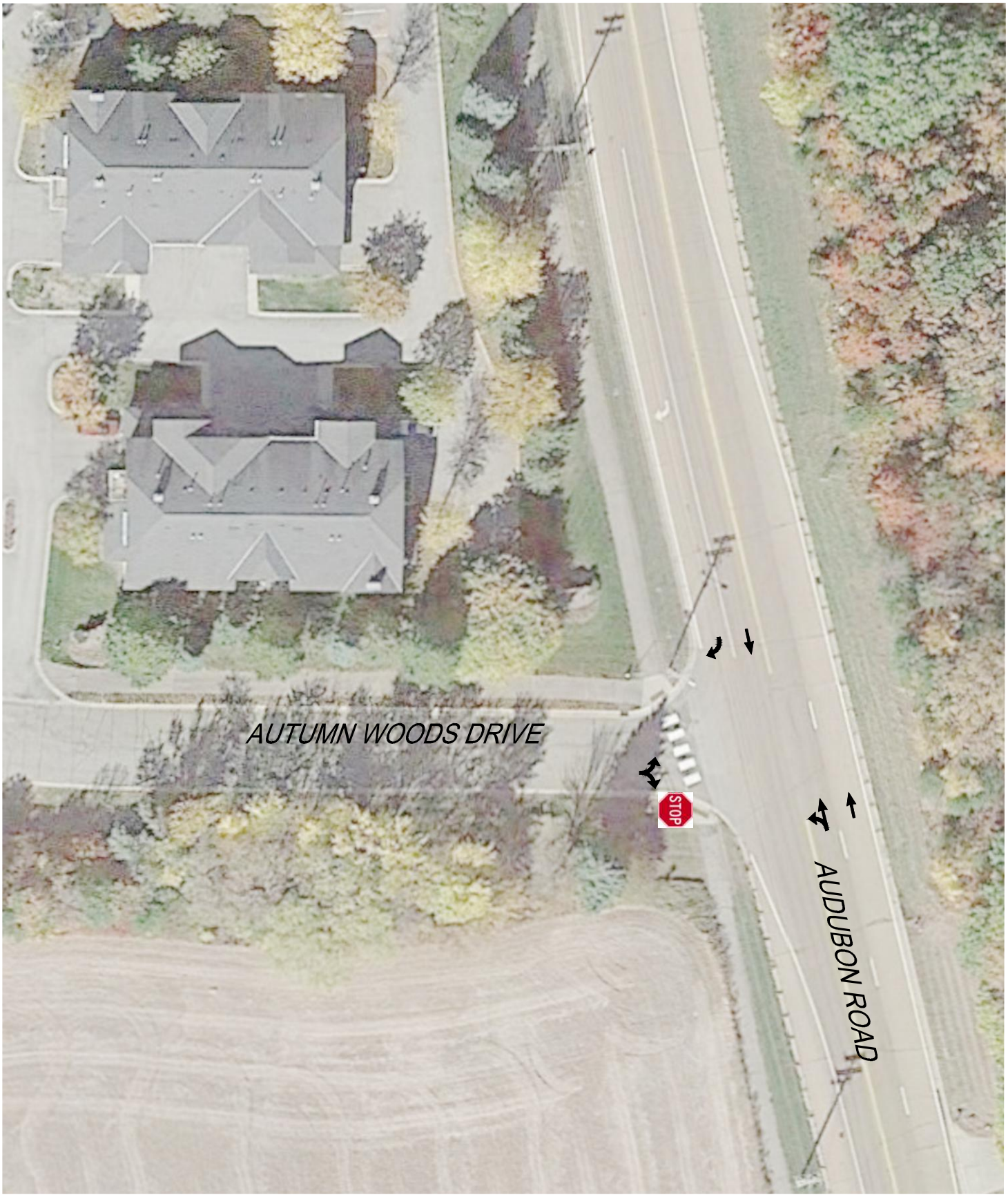


To request information from this document in an alternative format, call 651-366-4718 or 1-800-657-3774 (Greater Minnesota); 711 or 1-800-627-3529 (Minnesota Relay). You may also send an e-mail to ADArequest.dot@state.mn.us. (Please request at least one week in advance.)

SHEET 1 OF 1

Appendix C: Intersection and Site Configuration Map

7.A. PUBLIC HEARING: Recommend... Packet Page 154 of...
Page 149 of...



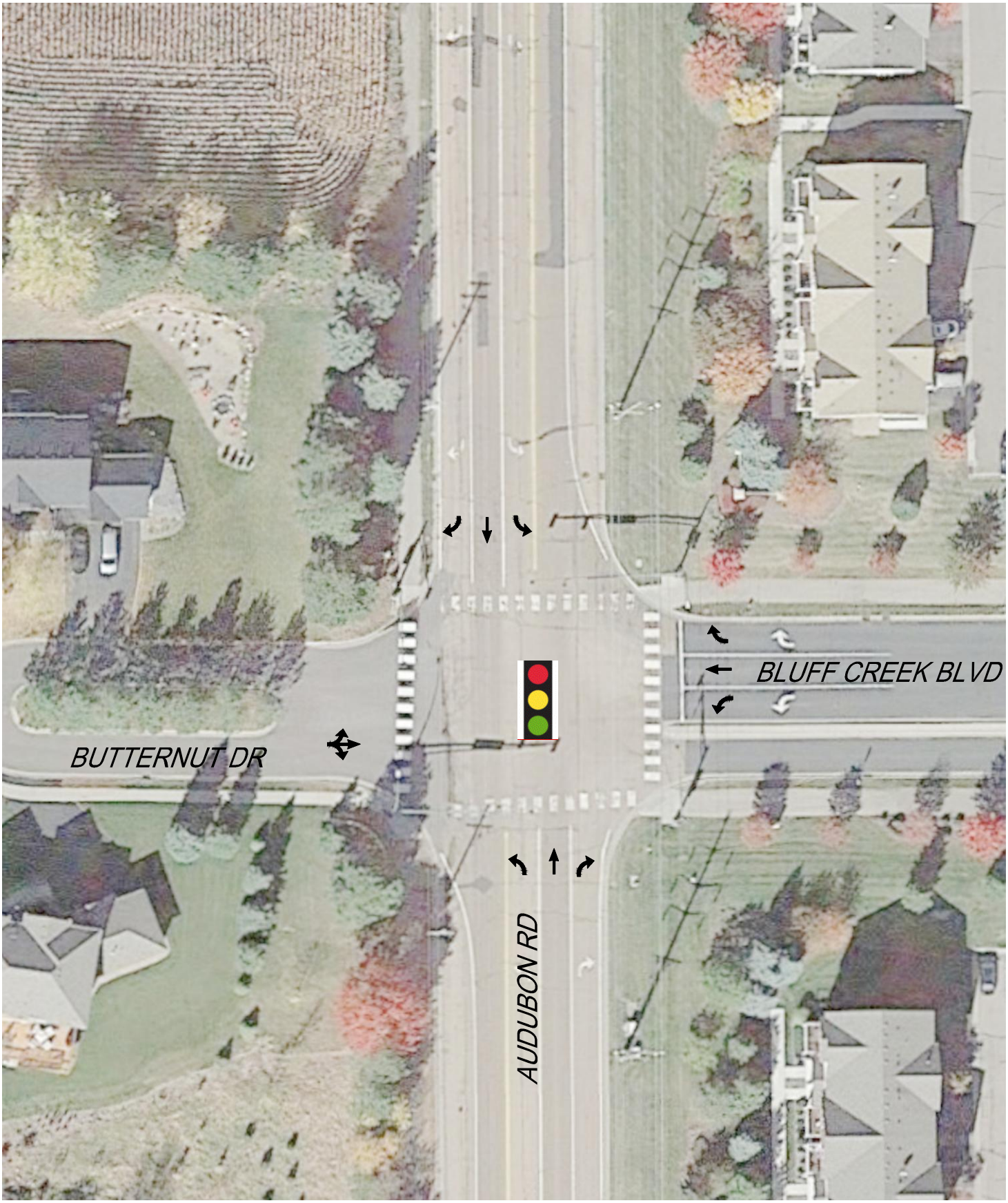
AUTUMN WOODS DRIVE + AUDUBON ROAD INTERSECTION

0 50 100
SCALE: 1" = 50 FEET

ISG
Architecture + Engineering + Environmental + Planning
www.isgmn.com

Lennar Wagner Woods
Chaska, MN - 05/20/2021
ISG PROJECT NO. 2021-24984

CAD FILE NAME: 24984 INTERSECTION EXHIBITS



AUDUBON RD + BLUFF CREEK BLVD + BUTTERNUT DR
INTERSECTION

0 50 100
SCALE: 1" = 50 FEET

ISG
Architecture + Engineering + Environmental + Planning
www.isgmn.com

Lennar Wagner Woods
Chaska, MN - 05/20/2021
ISG PROJECT NO. 2021-24984

CAD FILE NAME: 24984 INTERSECTION EXHIBITS



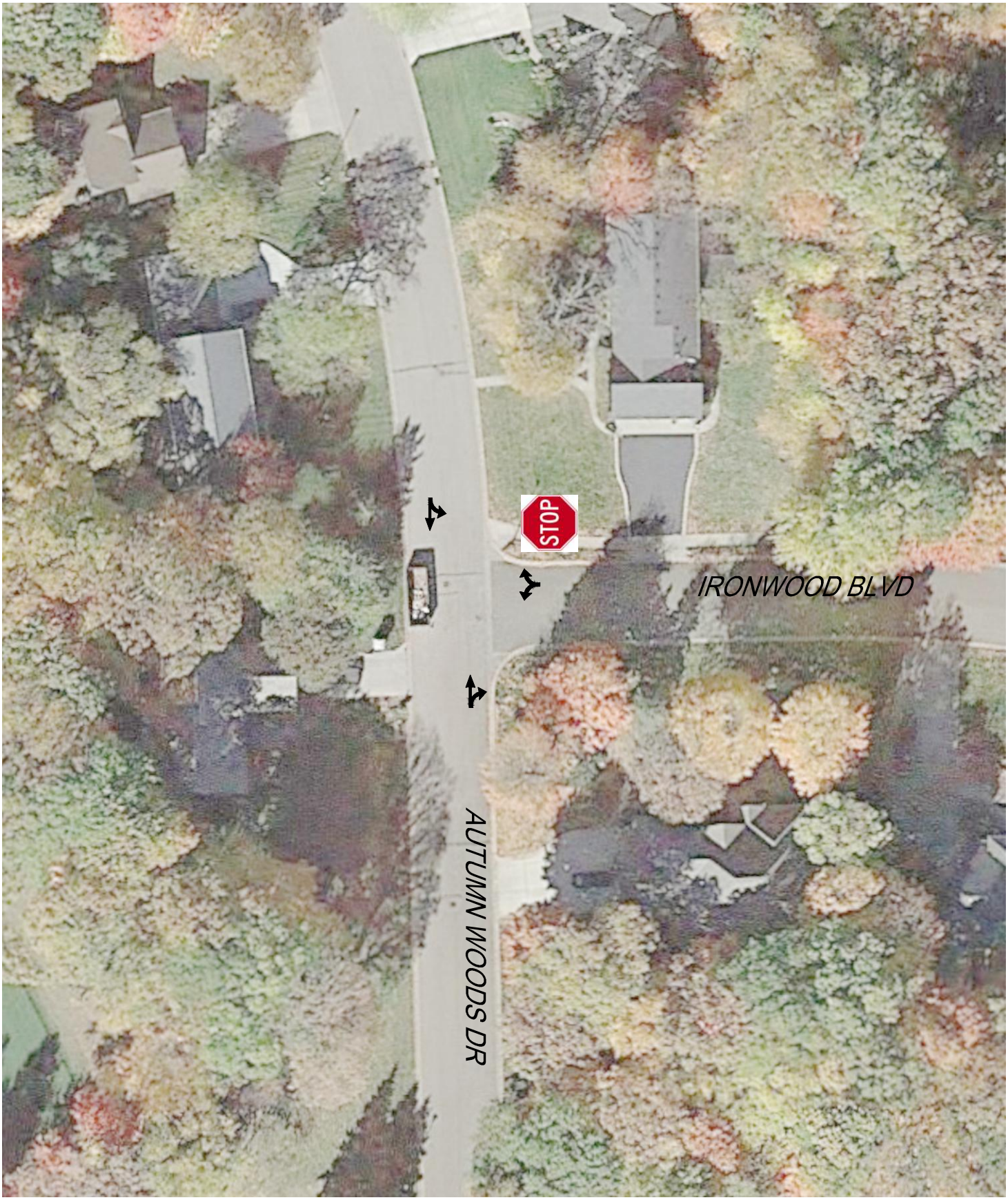
BUTTERNUT DR + IRONWOOD BLVD INTERSECTION

0 50 100
SCALE: 1" = 50 FEET

ISG
Architecture + Engineering + Environmental + Planning
www.isgmn.com

Lennar Wagner Woods
Chaska, MN - 05/20/2021
ISG PROJECT NO. 2021-24984

CAD FILE NAME: 24984 INTERSECTION EXHIBITS



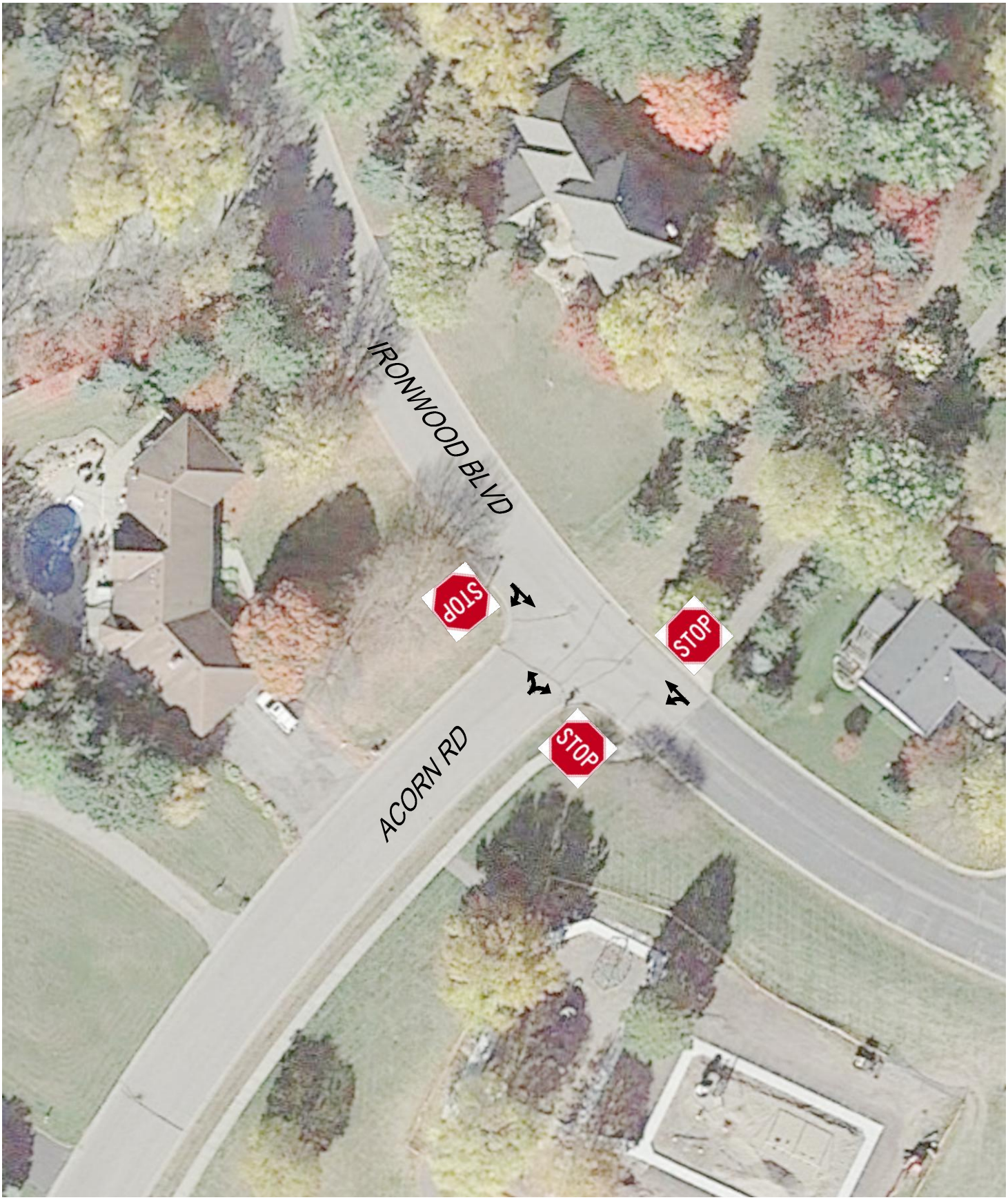
AUTUMN WOODS DR + IRONWOOD BLVD INTERSECTION

0 50 100
SCALE: 1" = 50 FEET

ISG
Architecture + Engineering + Environmental + Planning
www.isgmn.com

Lennar Wagner Woods
Chaska, MN - 05/20/2021
ISG PROJECT NO. 2021-24984

CAD FILE NAME: 24984 INTERSECTION EXHIBITS



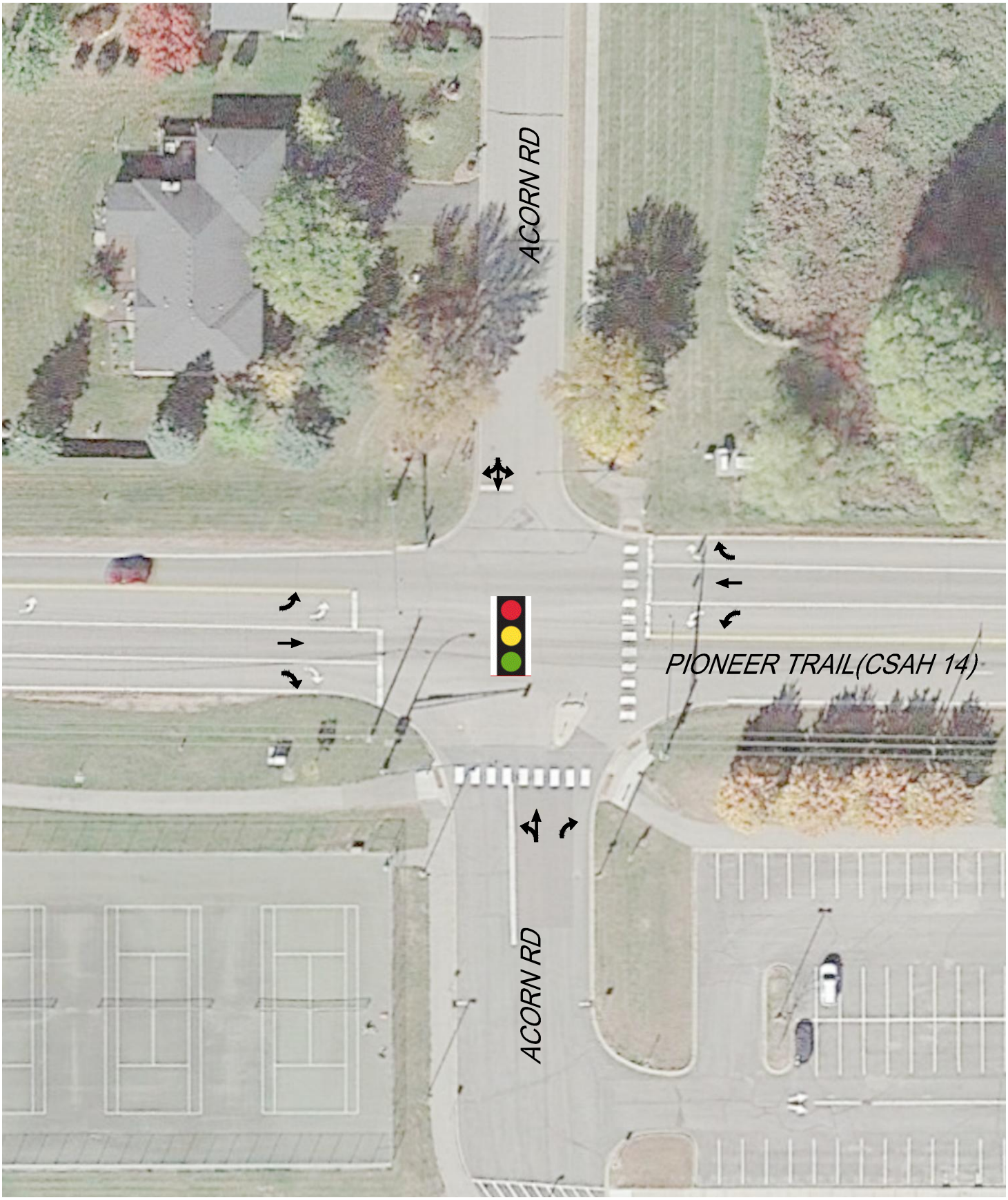
AUTUMN WOODS DR + ACORN RD INTERSECTION

0 50 100
SCALE: 1" = 50 FEET

ISG
Architecture + Engineering + Environmental + Planning
www.isgmn.com

Lennar Wagner Woods
Chaska, MN - 05/20/2021
ISG PROJECT NO. 2021-24984

CAD FILE NAME: 24984 INTERSECTION EXHIBITS



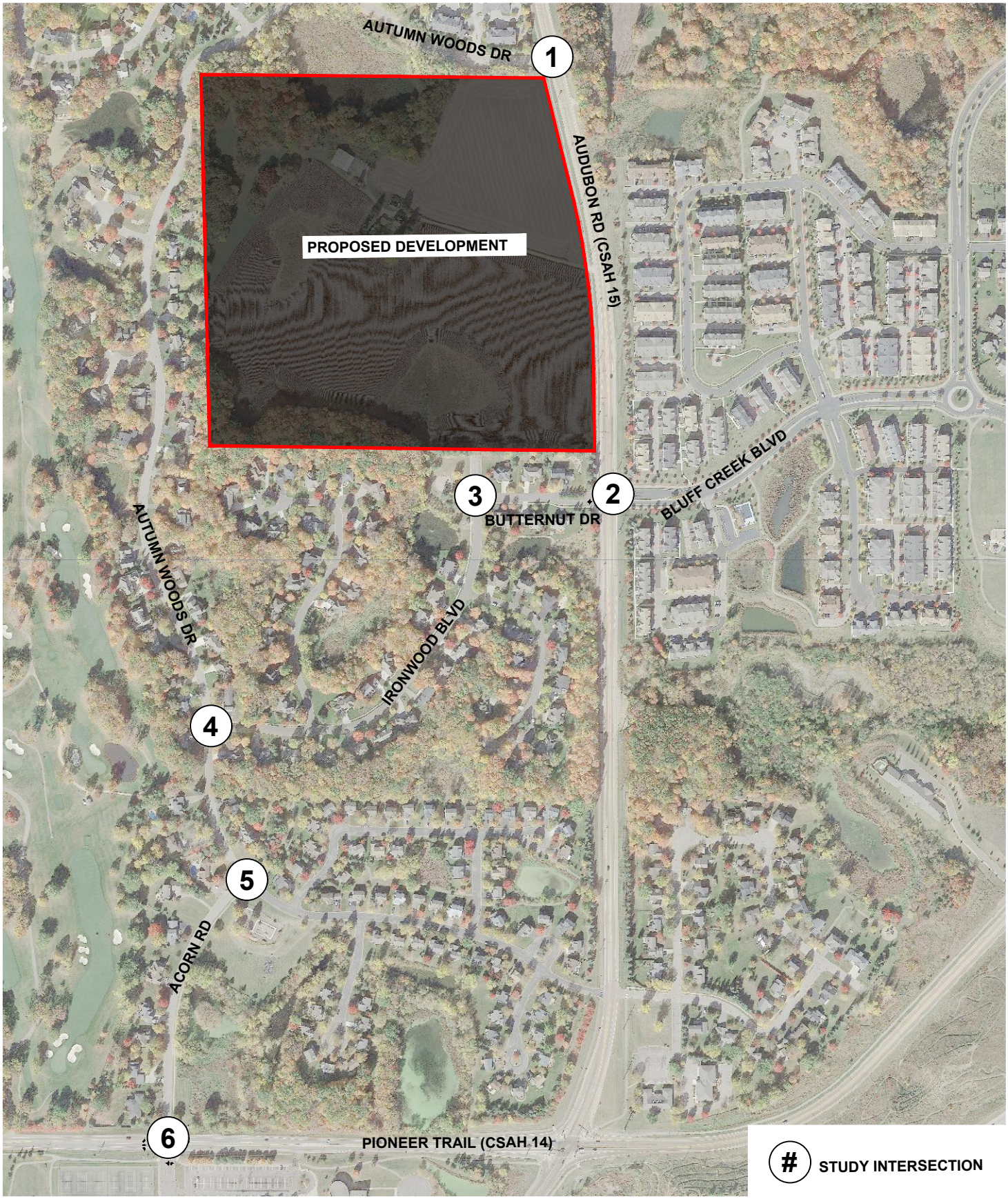
PIONEER TRAIL (CSAH 14) + ACORN RD INTERSECTION

0 50 100
SCALE: 1" = 50 FEET

ISG
Architecture + Engineering + Environmental + Planning
www.isgmn.com

Lennar Wagner Woods
Chaska, MN - 05/20/2021
ISG PROJECT NO. 2021-24984

CAD FILE NAME: 24984 INTERSECTION EXHIBITS



INTERSECTION MAP

0 250 500
SCALE: 1" = 500 FEET

ISG
Architecture + Engineering + Environmental + Planning
www.isgmn.com

Lennar Wagner Woods
Chaska, MN - 05/20/2021
ISG PROJECT NO. 2021-24984

CAD FILE NAME: 24984 INTERSECTION EXHIBITS

Appendix D: City of Chaska Zoning Map

7.A. PUBLIC HEARING: Recommend... Packet Page 162 of...

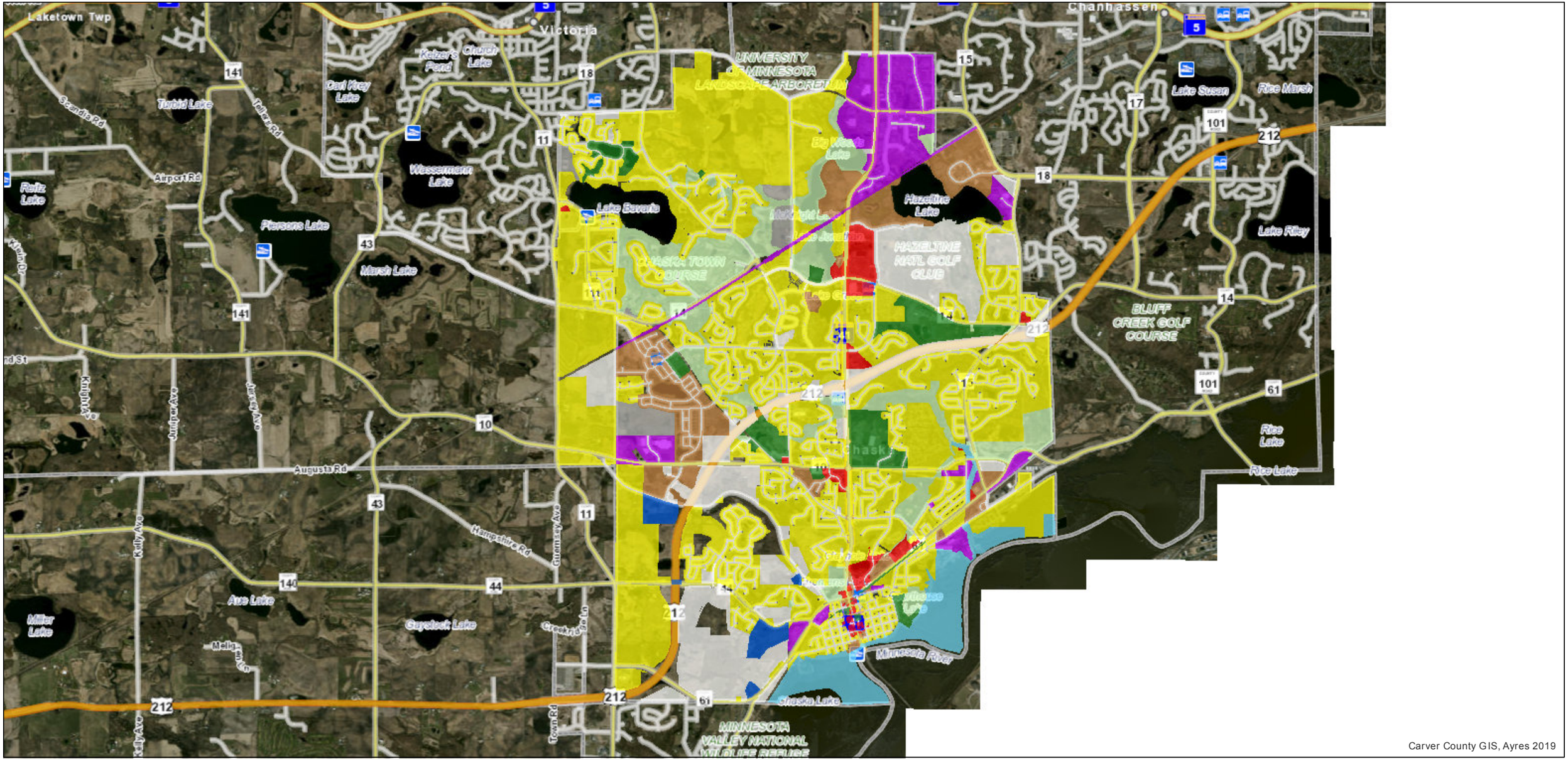
CITY OF CHASKA

Zoning Districts

Date: 6/30/2021

0 0.3 0.6 1.2 1.8 2.4 mi

N



Appendix E: Hourly Traffic Volume Counts

7.A. PUBLIC HEARING: Recommend... Packet Page 164 of...
Page 159 of...

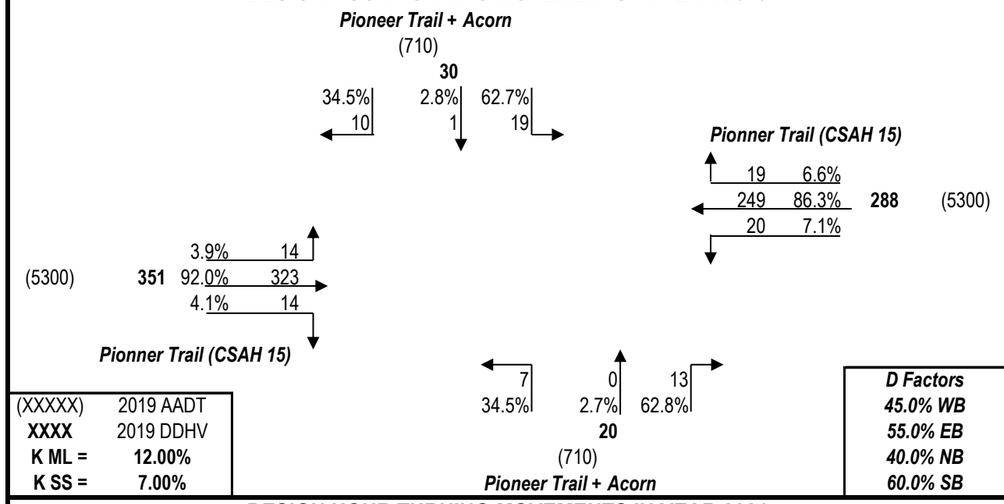
Intersection:	Ironwood Blvd. + Butternut Dr.	Acorn Rd. + Autumn Woods Dr.	Audubon Rd. (CSAH 15) + Autumn Woods Dr.	Audubon (CSAH 15) + Butternut Dr.	Ironwood Blvd. + Autumn Woods Dr.
Interval Start	**Total Veh. Volumes (per each intersection)**				
6:00	1	0	66	65	0
6:15	1	1	71	77	1
6:30	0	2	90	90	2
6:45	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

7.A. PUBLIC HEARING: Recommend... Packet Page 166 of...
Page 161 of...

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

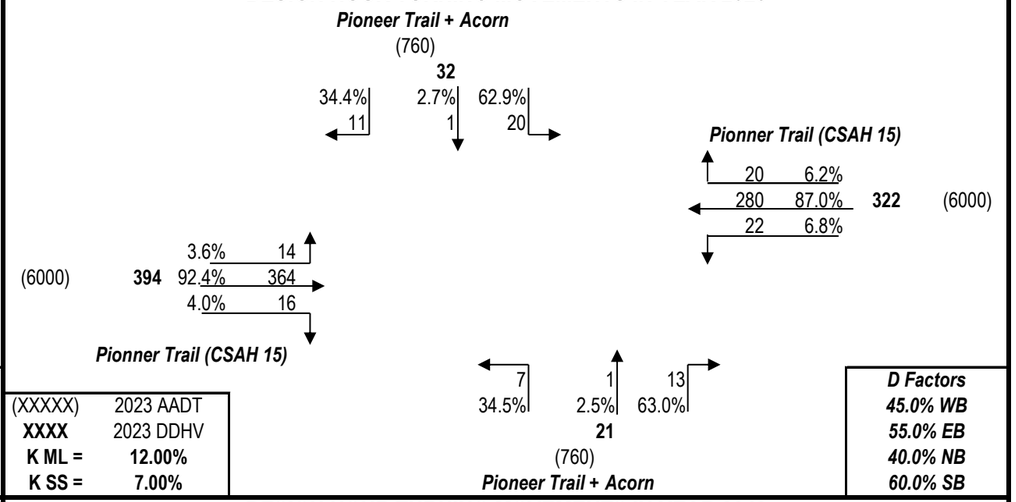
DESIGN HOUR TURNING MOVEMENTS IN YEAR 2019



(XXXXX)	2019 AADT
XXXX	2019 DDHV
K ML =	**12.00%**
K SS =	**7.00%**

D Factors
45.0% WB
55.0% EB
40.0% NB
60.0% SB

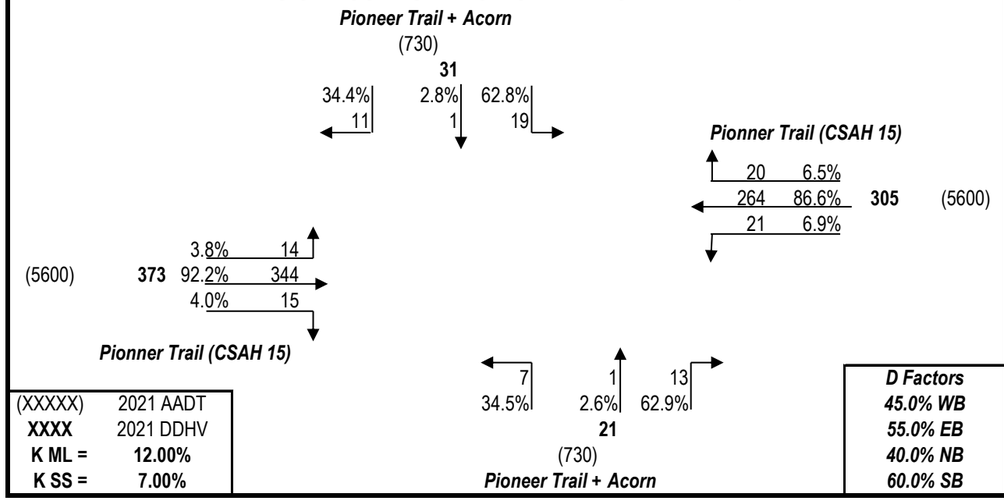
DESIGN HOUR TURNING MOVEMENTS IN YEAR 2023



(XXXXX)	2023 AADT
XXXX	2023 DDHV
K ML =	**12.00%**
K SS =	**7.00%**

D Factors
45.0% WB
55.0% EB
40.0% NB
60.0% SB

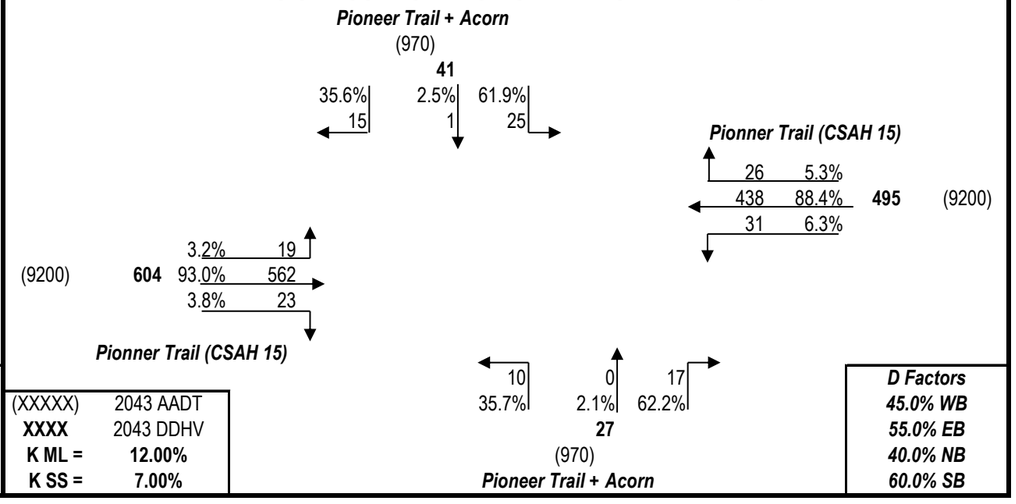
DESIGN HOUR TURNING MOVEMENTS IN YEAR 2021



(XXXXX)	2021 AADT
XXXX	2021 DDHV
K ML =	**12.00%**
K SS =	**7.00%**

D Factors
45.0% WB
55.0% EB
40.0% NB
60.0% SB

DESIGN HOUR TURNING MOVEMENTS IN YEAR 2043

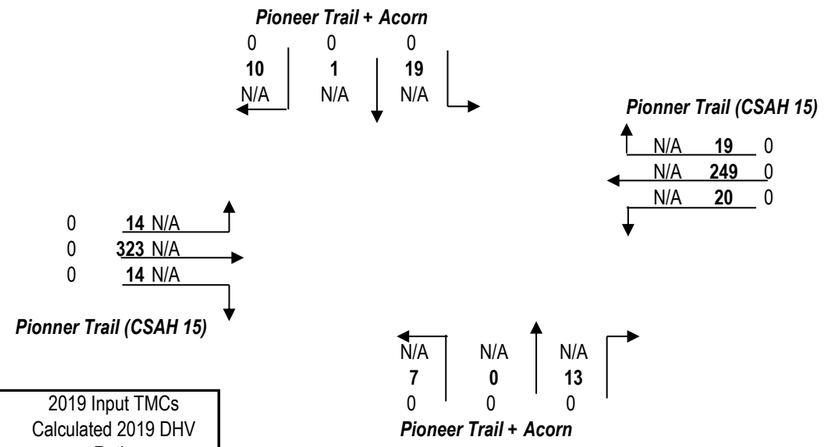


(XXXXX)	2043 AADT
XXXX	2043 DDHV
K ML =	**12.00%**
K SS =	**7.00%**

D Factors
45.0% WB
55.0% EB
40.0% NB
60.0% SB

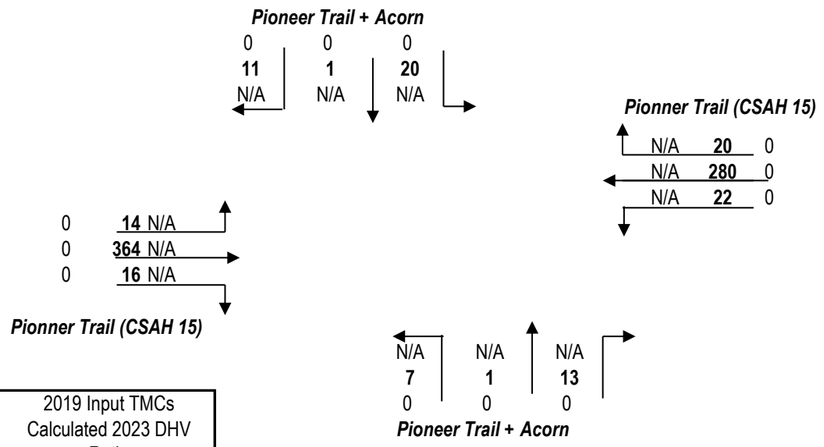
PROJECT TRAFFIC FOR Pionner Trail (CSAH 15) AT Pioneer Trail + Acorn

2019 INPUT TMCs COMPARED TO 2019 DHV



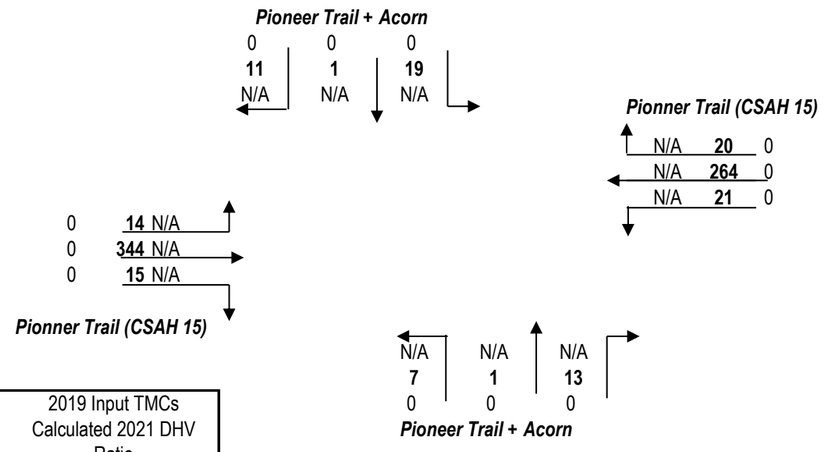
(XXX)	2019 Input TMCs
XXX	Calculated 2019 DHV
X.XX	Ratio

2019 INPUT TMCs COMPARED TO 2023 DHV



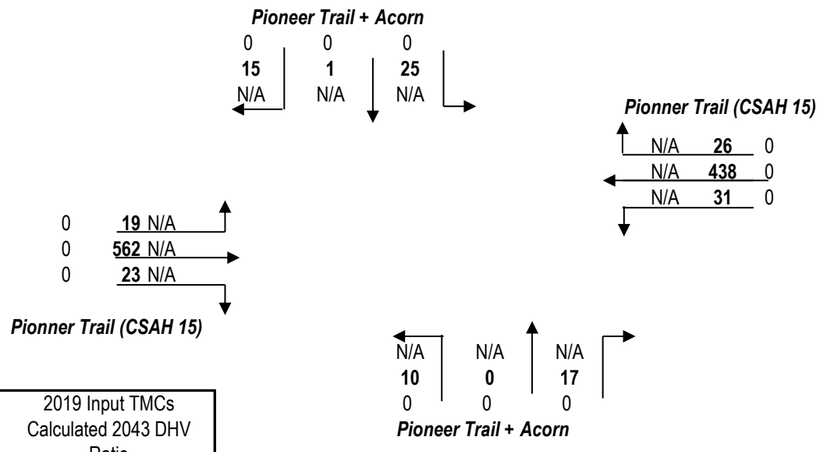
(XXX)	2019 Input TMCs
XXX	Calculated 2023 DHV
X.XX	Ratio

2019 INPUT TMCs COMPARED TO 2021 DHV



(XXX)	2019 Input TMCs
XXX	Calculated 2021 DHV
X.XX	Ratio

2019 INPUT TMCs COMPARED TO 2043 DHV



(XXX)	2019 Input TMCs
XXX	Calculated 2043 DHV
X.XX	Ratio

Appendix G: Existing (2021) Synchro Analysis Worksheets

7.A. PUBLIC HEARING: Recommend... Packet Page 169 of...
Page 164 of...

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane 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		

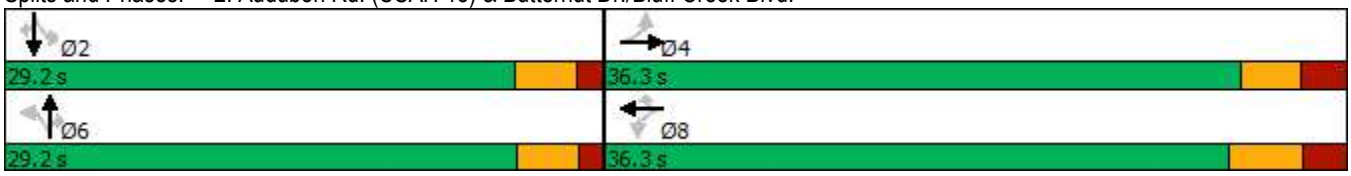
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	896	1103	-
HCM Lane V/C Ratio	-	-	0.022	0.004	-
HCM Control Delay (s)	-	-	9.1	8.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

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	

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			

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



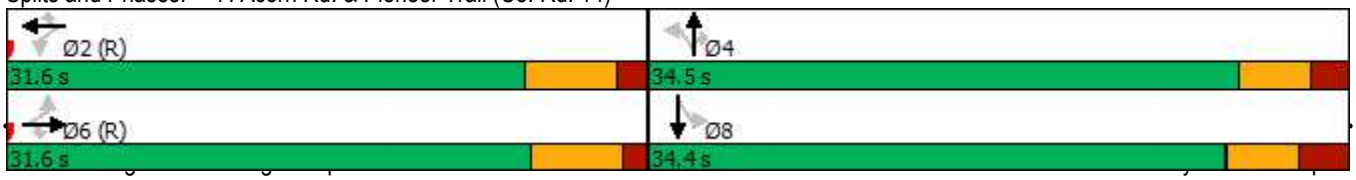
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	344	15	21	264	20	7	1	13	19	1	11
Future Volume (vph)	14	344	15	21	264	20	7	1	13	19	1	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	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	

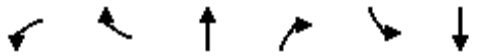
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	6		6	2		2	4		4	8		
Detector Phase	6	6	6	2	2	2	4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	8.0	8.0	5.0	5.0	
Minimum Split (s)	25.8	25.8	25.8	30.1	30.1	30.1	34.5	34.5	34.5	24.1	24.1	
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	0.04	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)





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

7.A. PUBLIC HEARING: Recommend... Packet Page 180 of...



TRIP DISTRIBUTION SCENARIO 1 EXITING

0 250 500
SCALE: 1" = 500 FEET

ISG
Architecture + Engineering + Environmental + Planning

RESERVE AT AUTUMN WOODS
CHASKA, MN - 06/30/2021
ISG PROJECT NO. 21-24984

CAD FILE NAME: 24984 TRIP DISTRIBUTION EXHIBITS



TRIP DISTRIBUTION SCENARIO 1 ENTERING

0 250 500
SCALE: 1" = 500 FEET

ISG
Architecture + Engineering + Environmental + Planning
www.isgmn.com

RESERVE AT AUTUMN WOODS
CHASKA, MN - 06/30/2021
ISG PROJECT NO. 21-24984

CAD FILE NAME: 24984 TRIP DISTRIBUTION EXHIBITS



TRIP DISTRIBUTION SCENARIO 2 EXITING

SCALE: 1" = 500 FEET

ISG Architecture + Engineering + Environmental + Planning

RESERVE AT AUTUMN WOODS
CHASKA, MN - 06/30/2021
ISG PROJECT NO. 21-24984

CAD FILE NAME: 24984 TRIP DISTRIBUTION EXHIBITS



TRIP DISTRIBUTION SCENARIO 2 ENTERING

0 250 500
SCALE: 1" = 500 FEET

ISG
Architecture + Engineering + Environmental + Planning
www.isgmn.com

RESERVE AT AUTUMN WOODS
CHASKA, MN - 06/30/2021
ISG PROJECT NO. 21-24984

CAD FILE NAME: 24984 TRIP DISTRIBUTION EXHIBITS



TRIP DISTRIBUTION SCENARIO 3 ENTERING (2023)

SCALE: 1" = 500 FEET

ISG
Architecture + Engineering + Environmental + Planning

RESERVE AT AUTUMN WOODS
CHASKA, MN - 06/30/2021
ISG PROJECT NO. 21-24984

CAD FILE NAME: 24984 TRIP DISTRIBUTION EXHIBITS



TRIP DISTRIBUTION SCENARIO 3 EXITING (2023)

SCALE: 1" = 500 FEET

ISG Architecture + Engineering + Environmental + Planning

RESERVE AT AUTUMN WOODS
CHASKA, MN - 06/30/2021
ISG PROJECT NO. 21-24984

CAD FILE NAME: 24984 TRIP DISTRIBUTION EXHIBITS



TRIP DISTRIBUTION SCENARIO 3 ENTERING (2043)

0 250 500
SCALE: 1" = 500 FEET

ISG
Architecture + Engineering + Environmental + Planning
www.isgmn.com

RESERVE AT AUTUMN WOODS
CHASKA, MN - 08/11/2021
ISG PROJECT NO. 21-24984

CAD FILE NAME: 24984 SENSITIVITY STUDY EXHIBITS



TRIP DISTRIBUTION SCENARIO 3 EXITING (2043)

0 250 500
SCALE: 1" = 500 FEET

ISG
Architecture + Engineering + Environmental + Planning
www.isgmn.com

RESERVE AT AUTUMN WOODS
CHASKA, MN - 08/11/2021
ISG PROJECT NO. 21-24984

CAD FILE NAME: 24984 SENSITIVITY STUDY EXHIBITS

Appendix I: Intersection 1 Warrant Anlysis

7.A. PUBLIC HEARING: Recommend... Packet Page 189 of...
Page 184 of...

Multi-Way Stop Application

OMUTCD Section 2B.07

	Warranted ?
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.	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.* *If this condition is satisfied, there must also be an average delay of at least 30 seconds per vehicle during the peak hour.	No
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 Major/ Minor	ADJUSTED VOLUMES		Condition C.1		Condition C.2		Condition D	
	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*							
											Cond. A		Cond. B		Cond. A		Cond. B	
	Major	Minor	100%		70%		100%		70%		80%		80%		56%		56%	
			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																
1:00 AM	0	0																
1:15 AM	0	0																
1:30 AM	0	0																
1:45 AM	0	0																
2:00 AM	0	0																
2:15 AM	0	0																
2:30 AM	0	0																
2:45 AM	0	0																
3:00 AM	0	0																
3:15 AM	0	0																
3:30 AM	0	0																
3:45 AM	0	0																
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																

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																
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																
8:15 PM	0	0																
8:30 PM	0	0																
8:45 PM	0	0																
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**			

Warrant Met: **No**

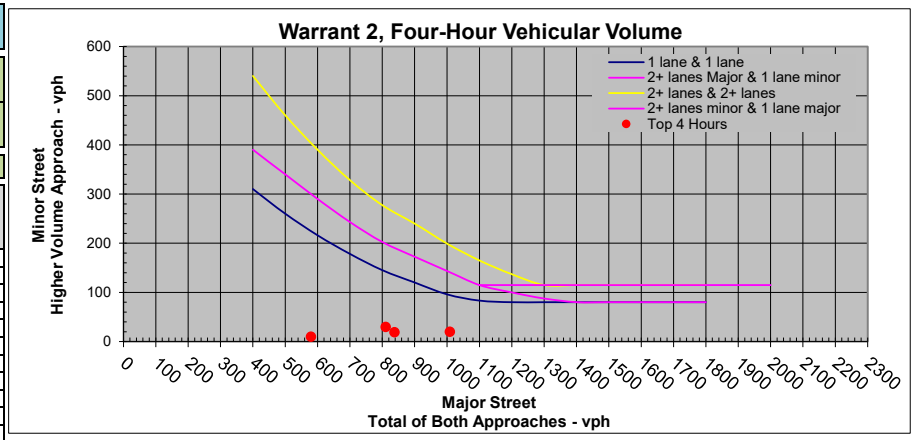
Notes:

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		

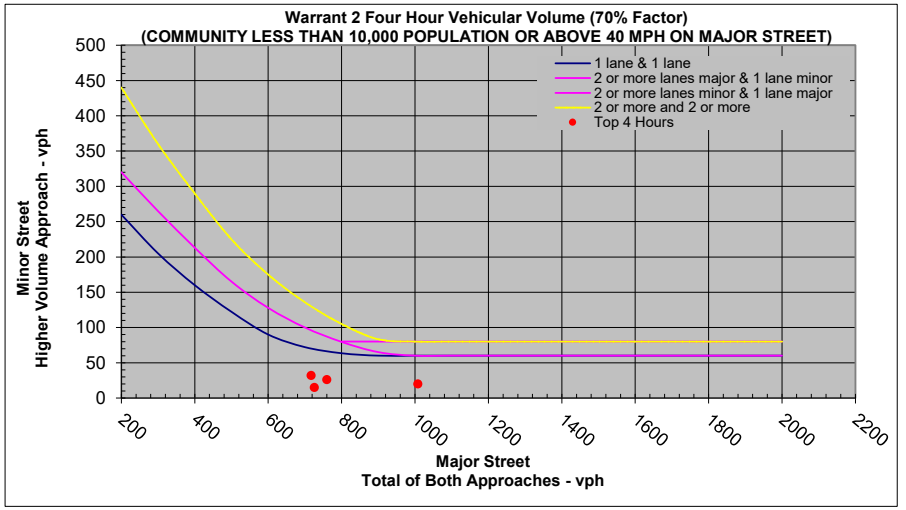
Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? Yes

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

Number of Lanes for Moving Traffic on Each Approach	Peak Hour Start time	3:30 PM
Major Street: 2 or More Lanes	Peak Hour End Time	4:30 PM
Minor Street: 1 Lane		

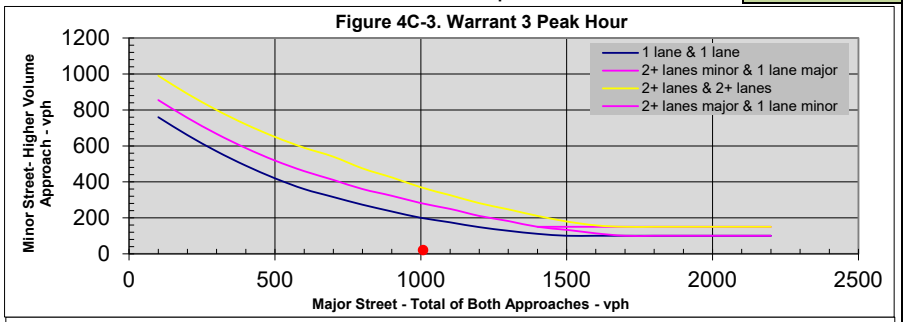
Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street?	Yes
Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time?	No

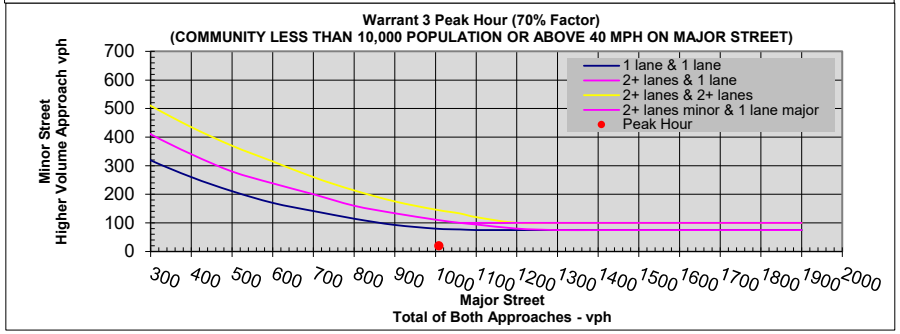
Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present*

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
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
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

If applicable, attach all supporting calculations and documentation.

Are the requirements for Warrant 3 met?: No





Hour Vehicular Volume

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
6:00 AM	397	3	400	400
6:15 AM	455	6	461	461
6:30 AM	579	10	589	589
6:45 AM	726	15	741	741
7:00 AM	758	18	776	776
7:15 AM	818	24	842	842
7:30 AM	810	30	840	840
7:45 AM	717	32	749	749
8:00 AM	632	31	663	663
8:15 AM	544	31	575	575
8:30 AM	449	27	476	476
8:45 AM	392	25	417	417
9:00 AM	384	25	409	409
9:15 AM	289	15	304	304
9:30 AM	197	9	206	206
9:45 AM	111	3	114	114
10:00 AM	381	23	404	404
10:15 AM	381	23	404	404
10:30 AM	381	23	404	404
10:45 AM	381	23	404	404
11:00 AM	349	19	368	368
11:15 AM	349	19	368	368
11:30 AM	349	19	368	368
11:45 AM	349	19	368	368
12:00 PM	405	15	420	420
12:15 PM	405	15	420	420
12:30 PM	405	15	420	420
12:45 PM	405	15	420	420
1:00 PM	414	13	427	427
1:15 PM	485	17	502	502
1:30 PM	556	19	575	575
1:45 PM	760	26	786	786
2:00 PM	517	20	537	537
2:15 PM	713	17	730	730
2:30 PM	837	19	856	856
2:45 PM	964	18	982	982
3:00 PM	1012	13	1025	1025
3:15 PM	994	18	1012	1012
3:30 PM	1008	20	1028	1028
3:45 PM	986	18	1004	1004
4:00 PM	907	20	927	927
4:15 PM	658	14	672	672
4:30 PM	449	8	457	457
4:45 PM	140	4	144	144
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
6:00 PM	0	0	0	0
6:15 PM	0	0	0	0
6:30 PM	0	0	0	0
6:45 PM	0	0	0	0
7:00 PM	0	0	0	0
7:15 PM	0	0	0	0
7:30 PM	0	0	0	0
7:45 PM	0	0	0	0
8:00 PM	0	0	0	0

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
1008	20	289.04422	99.129549

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
6:15 AM	455	5
6:30 AM	579	5
6:45 AM	726	5
7:00 AM	758	4
7:15 AM	818	4
7:30 AM	810	4
7:45 AM	717	4
8:00 AM	632	1
8:15 AM	544	1
8:30 AM	449	1
8:45 AM	392	1
9:00 AM	384	2
9:15 AM	289	2
9:30 AM	197	2
9:45 AM	111	2
10:00 AM	381	0
10:15 AM	381	0
10:30 AM	381	0
10:45 AM	381	0
11:00 AM	349	0
11:15 AM	349	0
11:30 AM	349	0
11:45 AM	349	0
12:00 PM	405	0
12:15 PM	405	0
12:30 PM	405	0
12:45 PM	405	0
1:00 PM	414	0
1:15 PM	485	0
1:30 PM	556	0
1:45 PM	760	0
2:00 PM	517	6
2:15 PM	713	6
2:30 PM	837	6
2:45 PM	964	6
3:00 PM	1012	4
3:15 PM	994	4
3:30 PM	1008	4
3:45 PM	986	4
4:00 PM	907	3
4:15 PM	658	3
4:30 PM	449	3
4:45 PM	140	3
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

Built-up Isolated Community With Less Than 10,000 Population or Above 35 MPH on Major Street?	Yes
15th Percentile Pedestrian Crossing Speed Less than 3.5 f/s?* **If applicable, attach all supporting calculations, documentation, and findings.*	No
If 15th Percentile Pedestrian Crossing Speed is Less than 3.5 f/s, Reduce Criterion by (up to 50%):	0%
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
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
Does the intersection meet the 4-Hour Volume?	No
Does the intersection meet the Peak Hour?	No
Are the Requirements for Warrant 4 Satisfied?	No

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-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

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

Figure 4C-5. Warrant 4, Pedestrians Four-Hour Volume

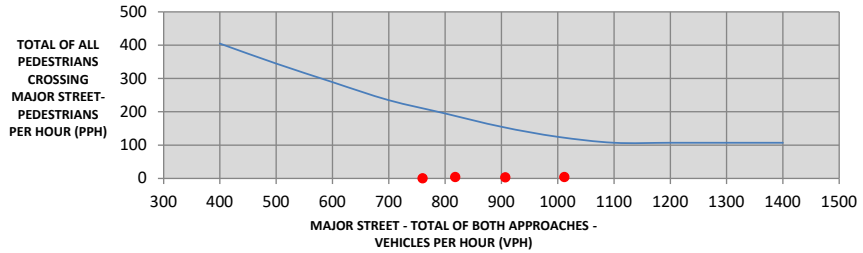
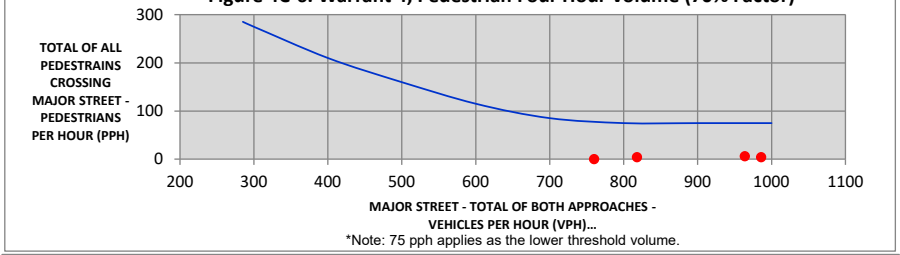
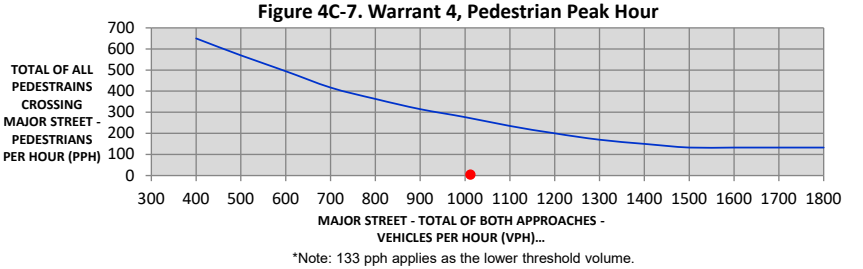


Figure 4C-6. Warrant 4, Pedestrian Four Hour Volume (70% Factor)



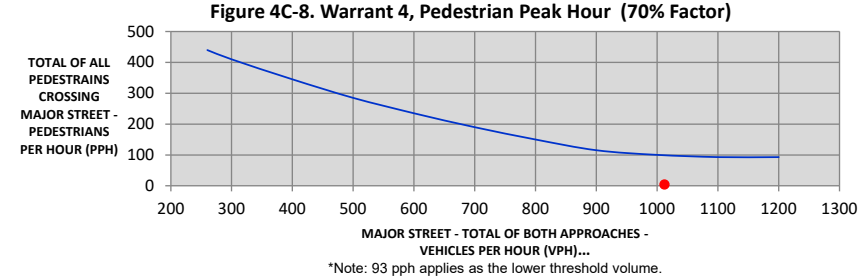
*Note: 75 pph applies as the lower threshold volume.

Figure 4C-7. Warrant 4, Pedestrian Peak Hour



*Note: 133 pph applies as the lower threshold volume.

Figure 4C-8. Warrant 4, Pedestrian Peak Hour (70% Factor)



*Note: 93 pph applies as the lower threshold volume.

OMUTCD WARRANT 5, SCHOOL CROSSING

Do school children (elementary through high school students) cross the major street?	No
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?	No
Is the distance to the nearest traffic control signal along the major street less than 300 feet?	No
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?	Yes
Minimum of 20 schoolchildren during the highest crossing hour?	No
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?	No

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?: No

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.	No
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.	No

**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?: No

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 calculat especially those relating to traffic volume projections and subsequent Warrant analyses.*

Are the requirements for Warrant 8 met?: No

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? No

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: 1

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): 0

Minor-Street Volume (One Direction Only, Approaching the Intersection): 0

Applicable Figure for Comparison: Figure 4C-9

Based on Figure 4C-9, is Warrant 9 Met?:*

If point on graph is above the designated line, then Warrant is met.

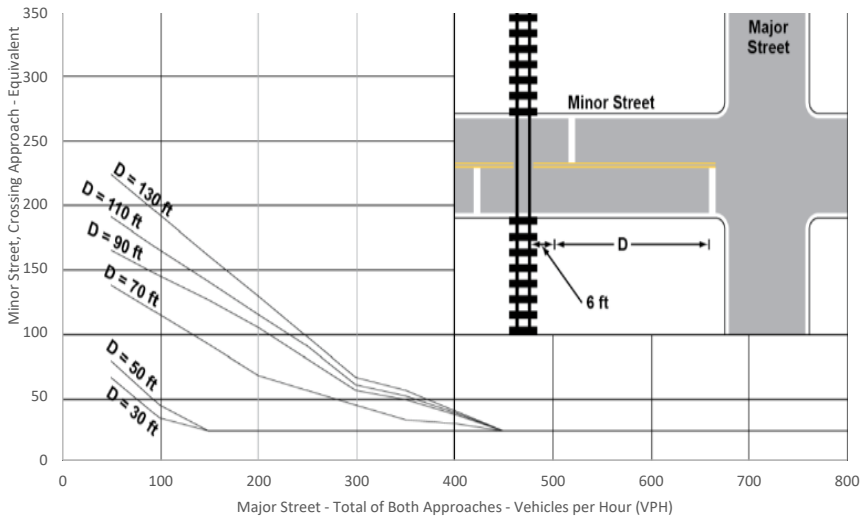
Figure 4C-9

Plot Points		Plot Points	
0	0	0	0
0	0	0	0

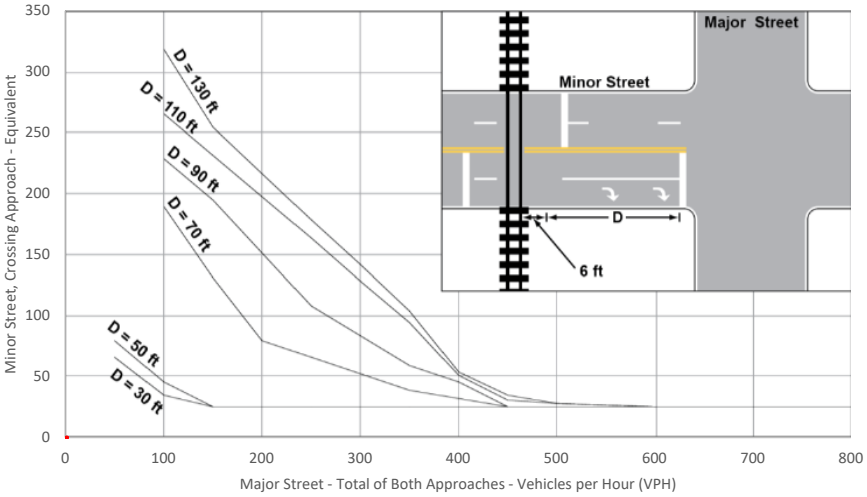
Figure 4C-10

Plot Points		Plot Points	

OMUTCD Figure 4C-9. Warrant 9, Intersection Near a Grade Crossing
(One Approach Lane at the Track Crossing)

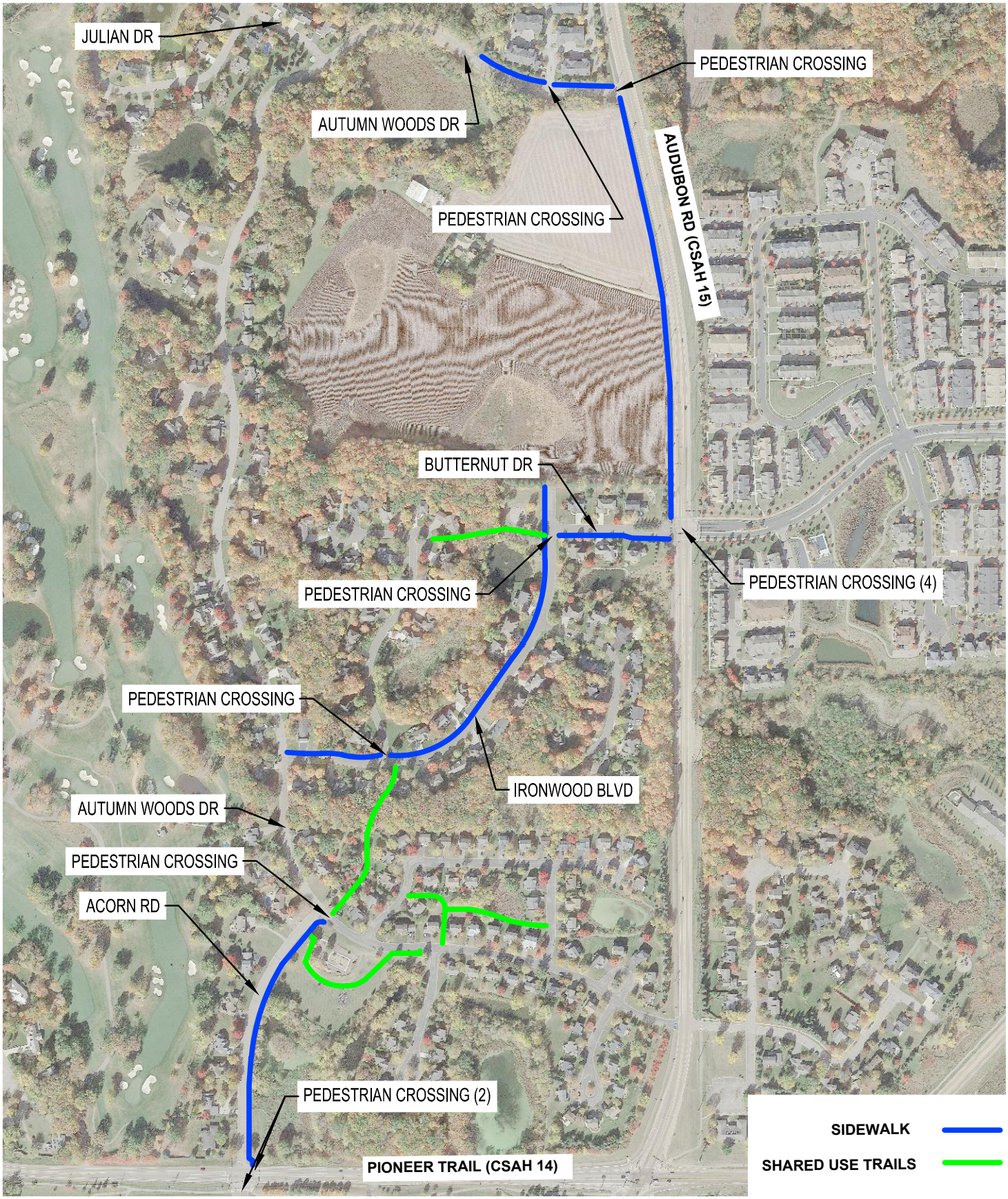


OMUTCD Figure 4C-10. Warrant 9, Intersection Near a Grade Crossing
(Two or More Approach Lanes at the Track Crossing)



Appendix J: Existing Shared Use Trail + Sidewalks

7.A. PUBLIC HEARING: Recommend... Packet Page 202 of...
Page 197 of...



EXISTING PEDESTRIAN FACILITY MAP

0 250 500
SCALE: 1" = 500 FEET

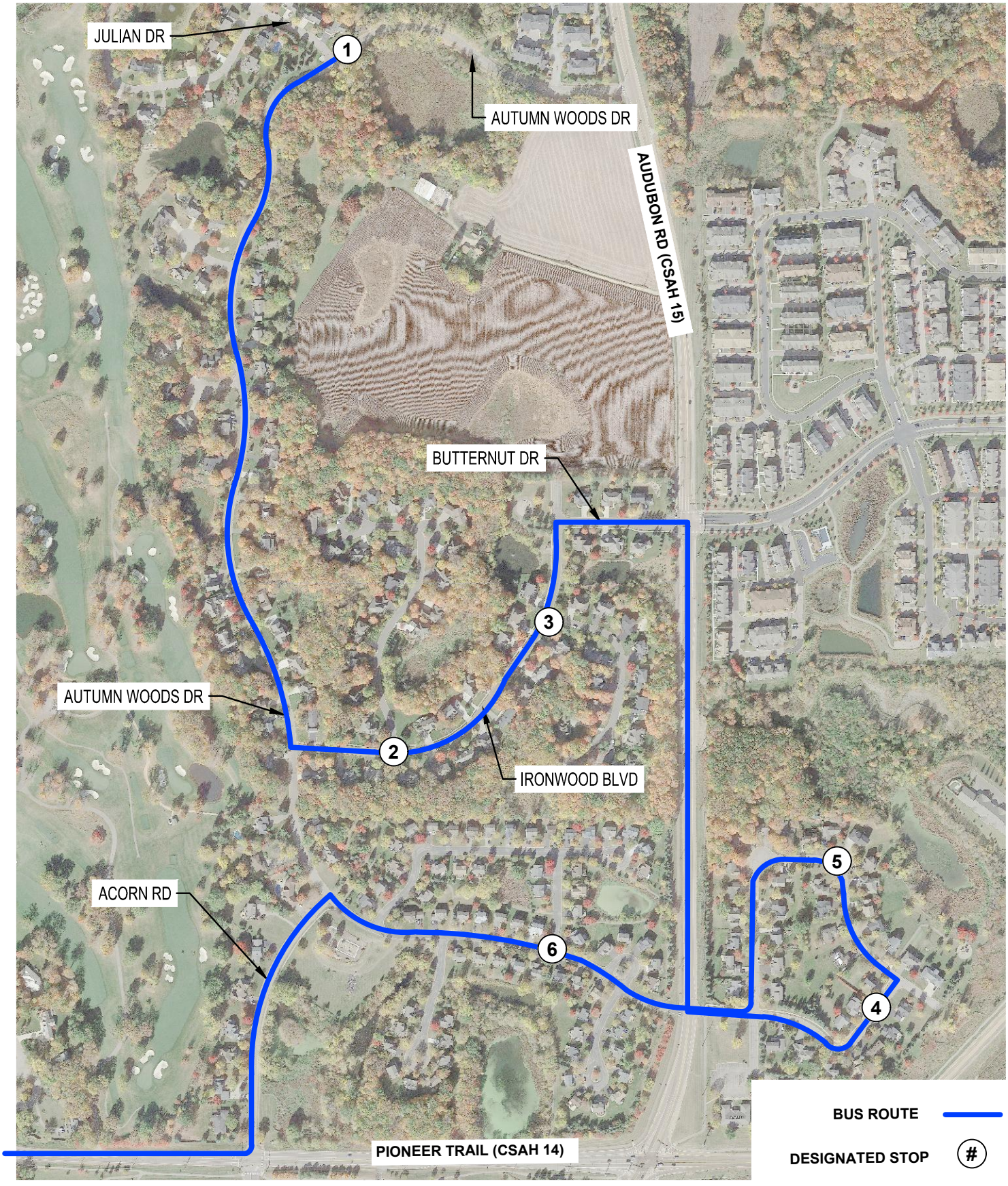
ISG
Architecture + Engineering + Environmental + Planning
www.isgmn.com

Lennar Wagner Woods
Chaska, MN - 05/24/2021
ISG PROJECT NO. 21-24984

CAD FILE NAME: 24984 EXISTING PEDESTRIAN FACILITY MAP

Appendix K: Existing Bus Routes

7.A. PUBLIC HEARING: Recommend... Packet Page 204 of...

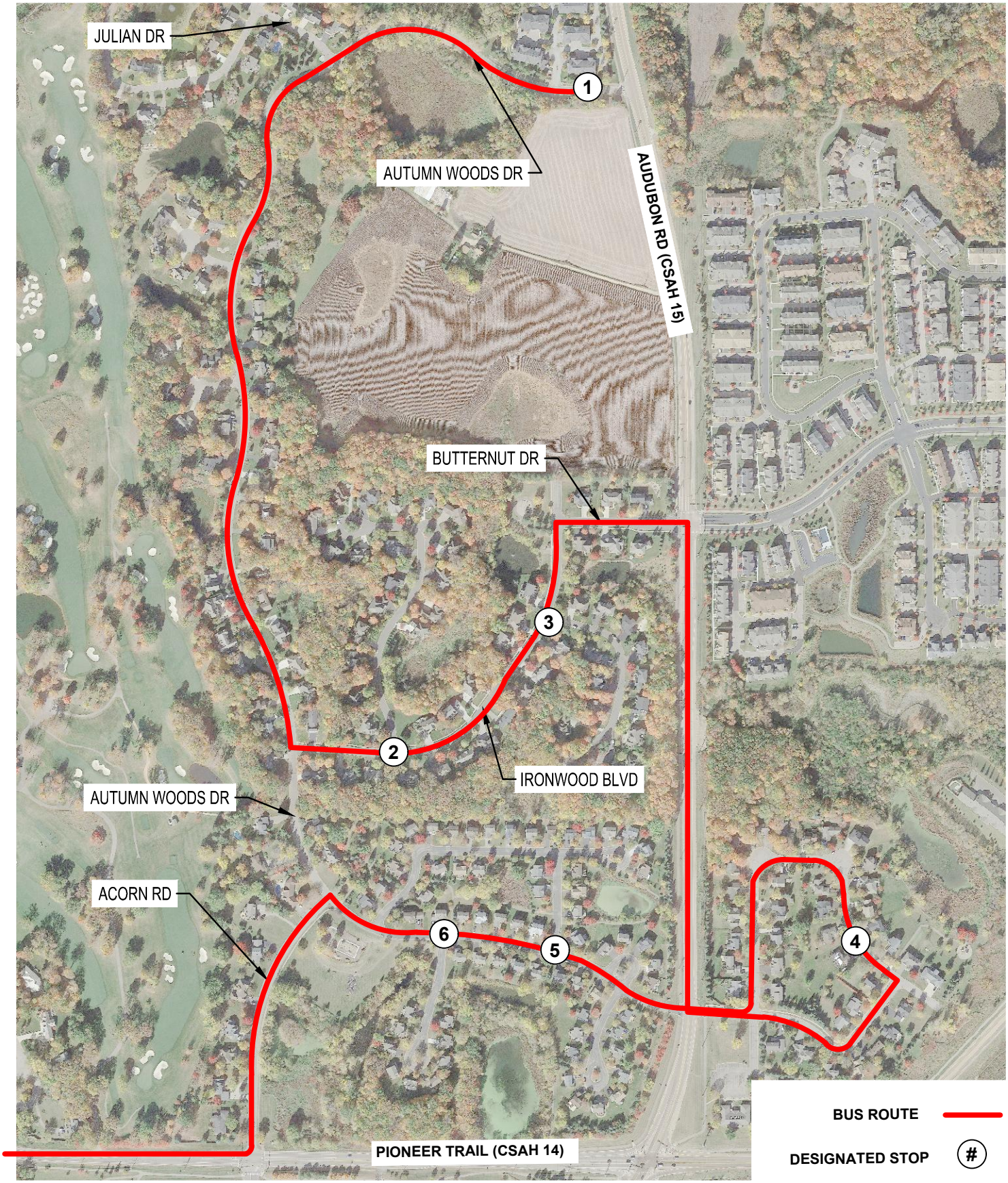


ELEMENTARY SCHOOL BUS ROUTE MAP

ISG
Architecture + Engineering + Environmental + Planning
isgmn.com

Lennar Wagner Woods
Chaska, MN - 05/24/2021
ISG PROJECT NO. 21-24984

CAD FILE NAME: 24984 BUS ROUTS



MIDDLE SCHOOL BUS ROUTE MAP

ISG

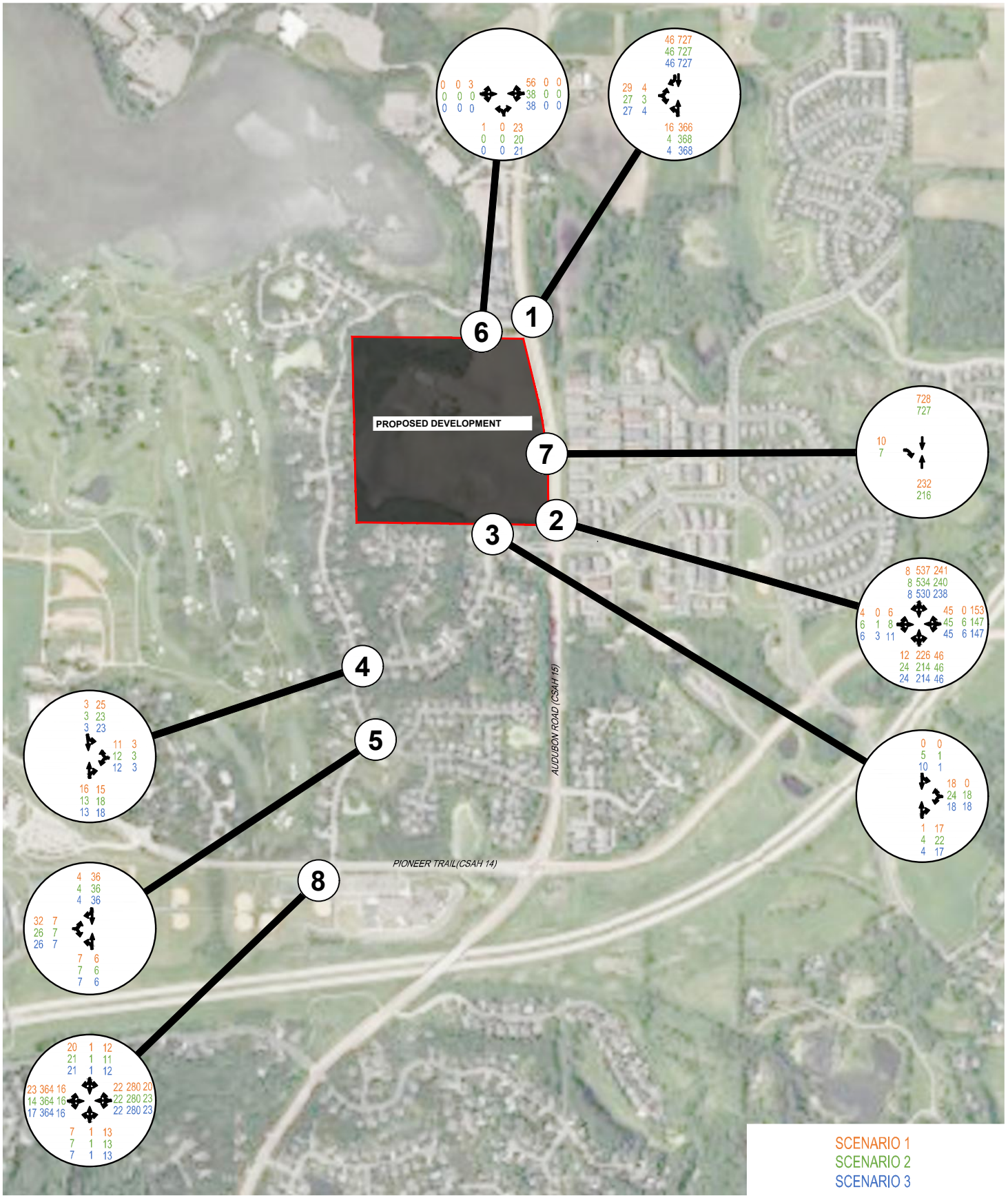
Architecture + Engineering + Environmental + Planning

Lennar Wagner Woods
Chaska, MN - 05/24/2021
ISG PROJECT NO. 21-24984

CAD FILE NAME: 24984 BUS ROUTE

Appendix L: Opening (2023) Volumes – Scenarios 1, 2, and 3

7.A. PUBLIC HEARING: Recommend... Packet Page 207 of...
Page 202 of...



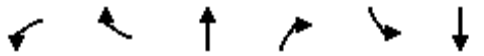
OPENING (2023) VOLUMES

ISG
Architecture + Engineering + Environmental + Planning
www.isgmn.com

The Reserve at Autumn Woods
Chaska, MN - 06/30/2021
ISG PROJECT NO. 2021-24984

CAD FILE NAME: A984 TIS EXHIBITS

Appendix M: Opening (2023) Synchro Analysis Worksheets – Scenarios 1, 2, and 3



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

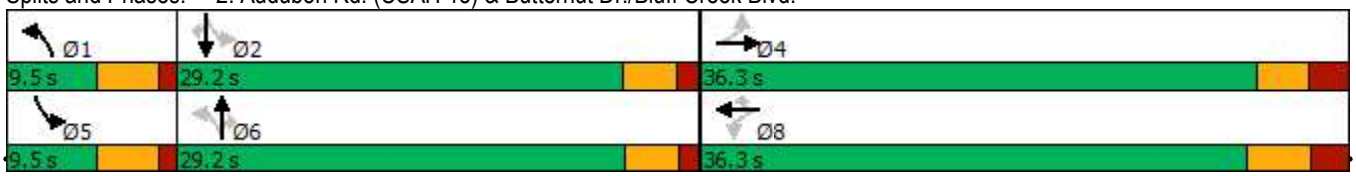
Network wide Queuing Penalty: 2

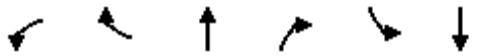
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	0	6	45	0	147	12	214	46	238	529	8
Future Volume (vph)	6	1	8	45	6	147	24	214	46	240	534	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	15	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	

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			

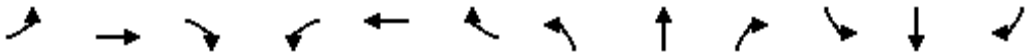
Splits and Phases: 2: Audubon Rd. (CSAH 15) & Butternut Dr./Bluff Creek Blvd.





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		

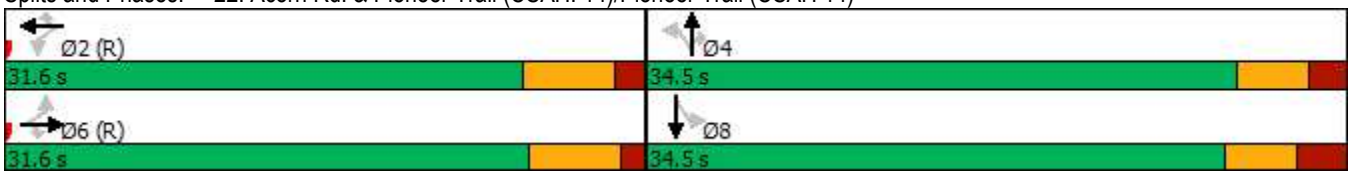


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	364	16	22	280	20	7	1	13	20	1	11
Future Volume (vph)	14	364	16	22	280	23	7	1	13	21	1	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	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	

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	0.04	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)



Intersection	
Int Delay, s/veh	1.5

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	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	37.5	0.2	0
HCM LOS	E		

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	NBR	WBLn1	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	-	-	-

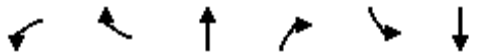
Intersection	
Int Delay, s/veh	0.1

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	-



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

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)

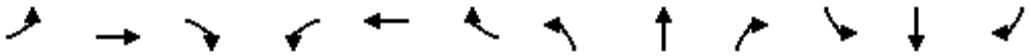
Intersection: 22: Acorn Rd. & Pioneer Trail (Co. Rd. 14)

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

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	

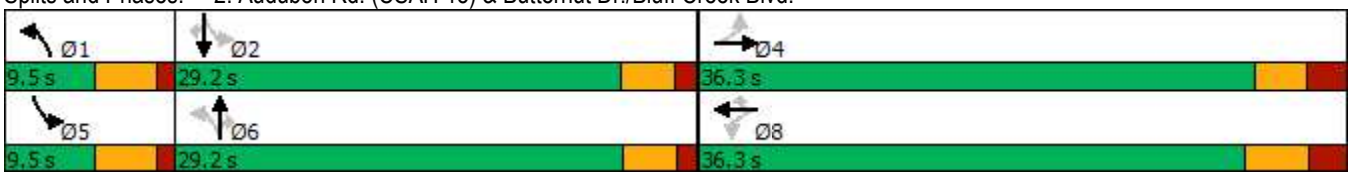


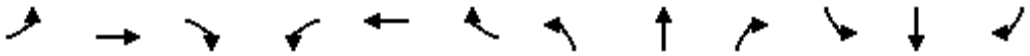
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	1	6	6	5	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	

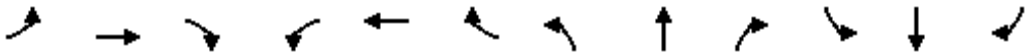
Intersection Signal Delay: 10.5	Intersection LOS: B
Intersection Capacity Utilization 50.6%	ICU Level of Service A
Analysis Period (min) 15	

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





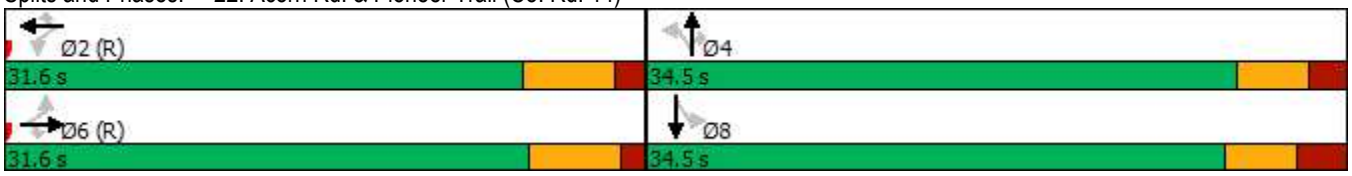
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	364	16	22	280	20	7	1	13	20	1	11
Future Volume (vph)	17	364	16	22	280	20	7	1	13	20	1	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	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	



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			

Splits and Phases: 22: Acorn Rd. & Pioneer Trail (Co. Rd. 14)



Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane 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	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	NBR	WBLn1	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	-

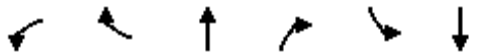
Intersection	
Int Delay, s/veh	4.6

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	-	-	-



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

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	0	-	0
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	NBR	WBLn1	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

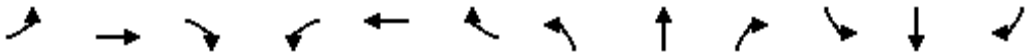
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	214	727	0
Future Vol, veh/h	0	10	0	232	728	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	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	-

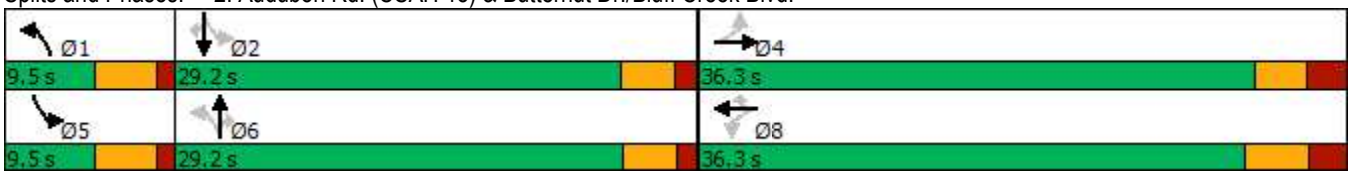
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	0	6	45	0	147	12	214	46	238	529	8
Future Volume (vph)	4	0	6	45	0	153	12	226	46	241	537	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	15	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	



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			

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

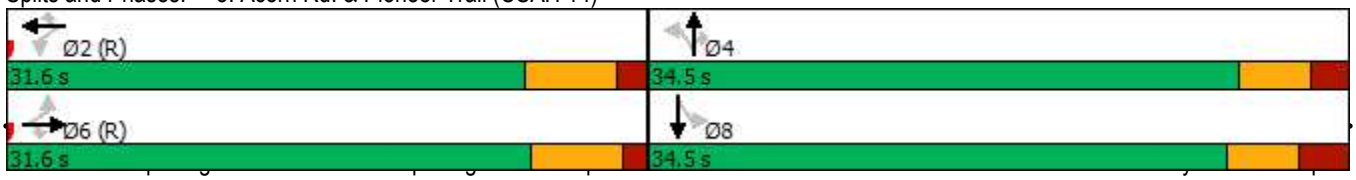


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	364	16	22	280	20	7	1	13	20	1	11
Future Volume (vph)	14	364	16	22	280	23	7	1	13	20	1	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	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
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)	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	

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	

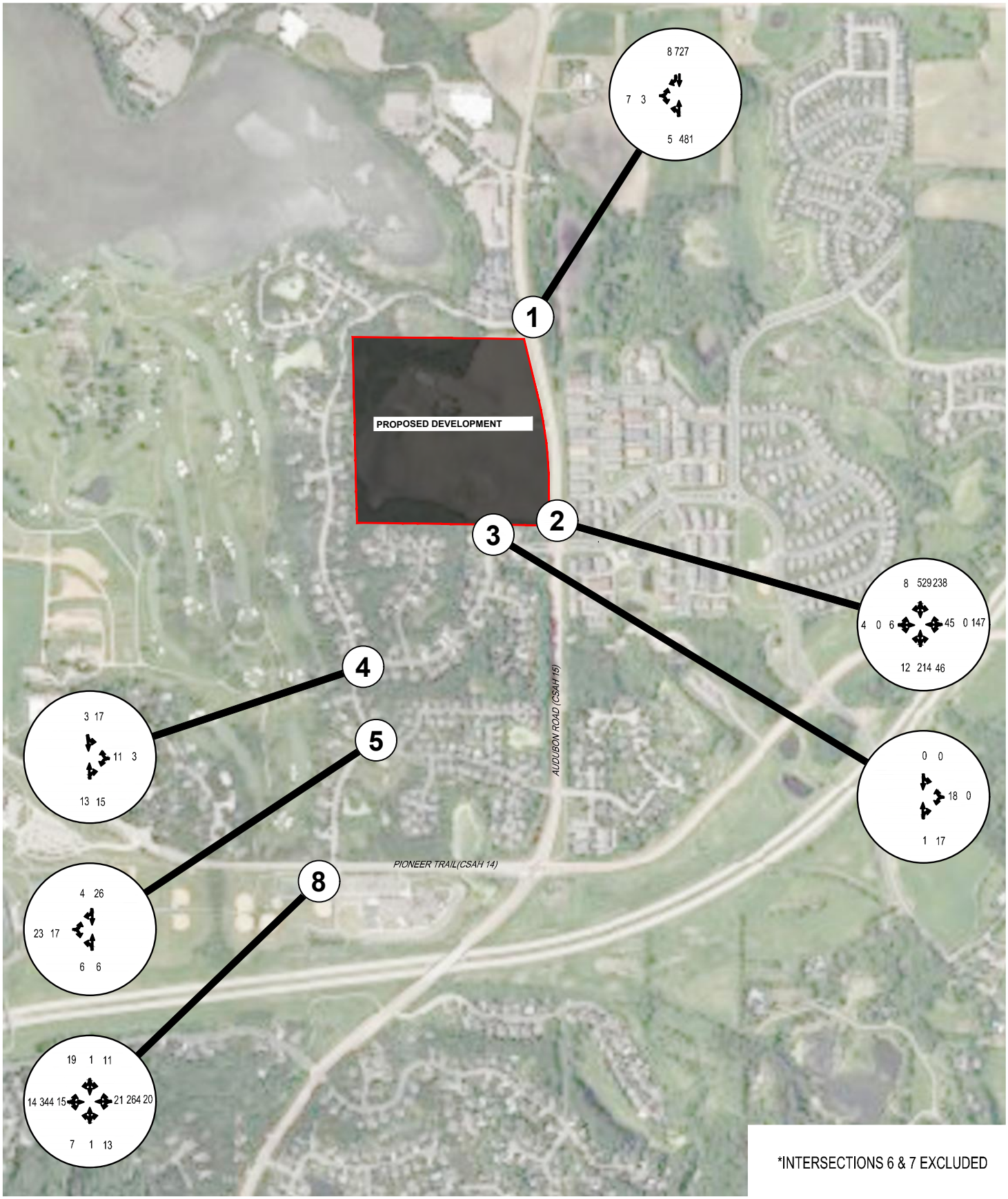
Intersection Summary			
Area Type:	Other		
Cycle Length: 66.1			
Actuated Cycle Length: 66.1			
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.54			
Intersection Signal Delay: 16.4		Intersection 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

7.A. PUBLIC HEARING: Recommend... Packet Page 255 of...
Page 250 of...



*INTERSECTIONS 6 & 7 EXCLUDED

NO BUILD (2023) VOLUMES

0 500 1000
SCALE: 1" =1000FEET

ISG
Architecture + Engineering + Environmental + Planning

The Reserve at Autumn Woods
Chaska, MN - 06/30/2021
ISG PROJECT NO. 2021-24984

CAD FILE NAME: A984 TIS EXHIBITS

Appendix 0: No Build (2023) Synchro Analysis Worksheets

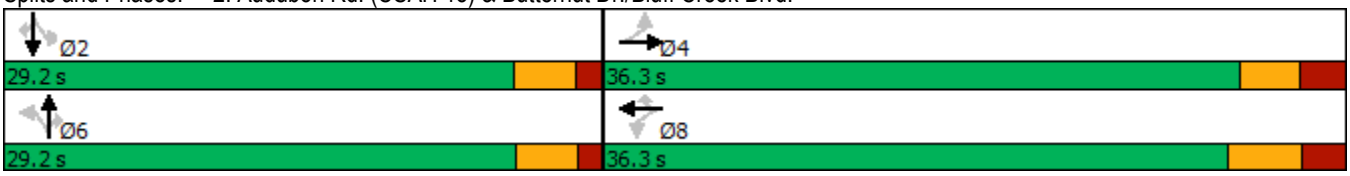
7.A. PUBLIC HEARING: Recommend... Packet Page 257 of...
Page 252 of...

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	

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	29.0	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			

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



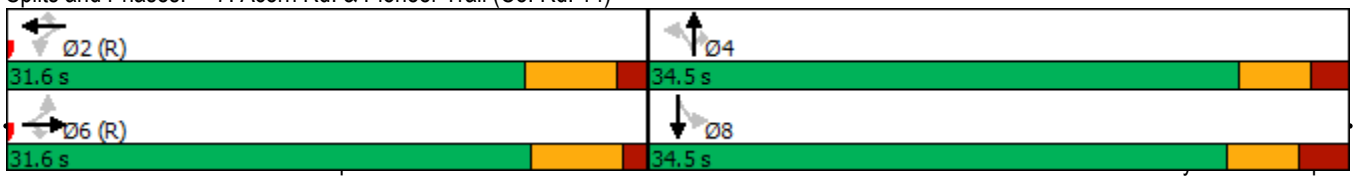
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	344	15	21	264	20	7	1	13	19	1	11
Future Volume (vph)	14	344	15	21	264	20	7	1	13	19	1	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	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	

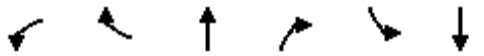
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	6		6	2		2	4		4	8		
Detector Phase	6	6	6	2	2	2	4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	8.0	8.0	5.0	5.0	
Minimum Split (s)	25.8	25.8	25.8	30.1	30.1	30.1	34.5	34.5	34.5	24.1	24.1	
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)





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	SBR
Lane 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	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	NBR	WBLn1	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	-

Intersection	
Intersection Delay, s/veh	6.9
Intersection LOS	A

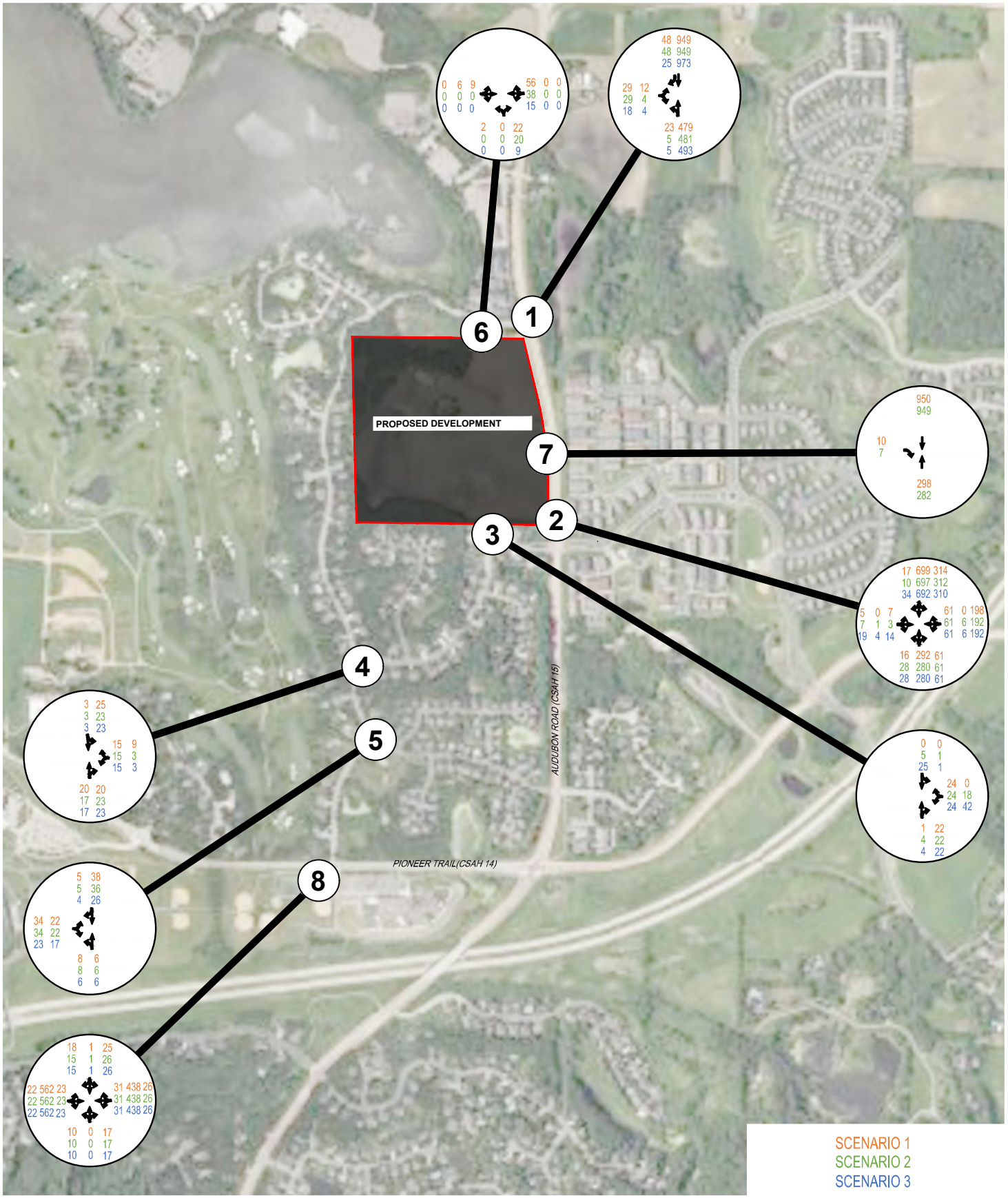
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	4	26	6	6	23	17
Future Vol, veh/h	4	26	6	6	23	17
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	0	0	0	0	4	6
Mvmt Flow	4	26	6	6	23	17
Number of Lanes	1	0	0	1	1	0

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

7.A. PUBLIC HEARING: Recommend... Packet Page 268 of...
Page 263 of...



FULL BUILD (2043) VOLUMES

Appendix Q: Full Build (2043) Synchro Analysis Worksheets – Scenarios 1, 2, and 3

7.A. PUBLIC HEARING: Recommend... Packet Page 270 of...
Page 265 of...

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)

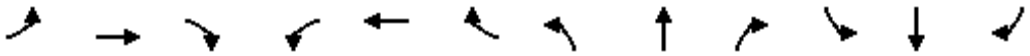
Intersection: 22: Acorn Rd. & Pioneer Trail (Co. Rd. 14)

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

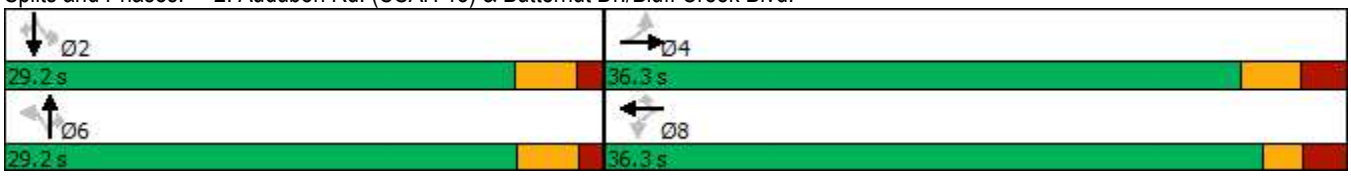
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	7	61	0	192	16	280	61	310	692	10
Future Volume (vph)	5	0	7	61	0	198	16	292	61	314	699	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	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	

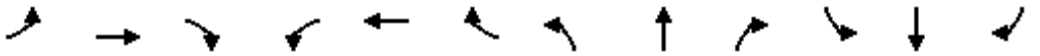


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm		Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			6			2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	6	6	6	2	2	2
Switch 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			

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





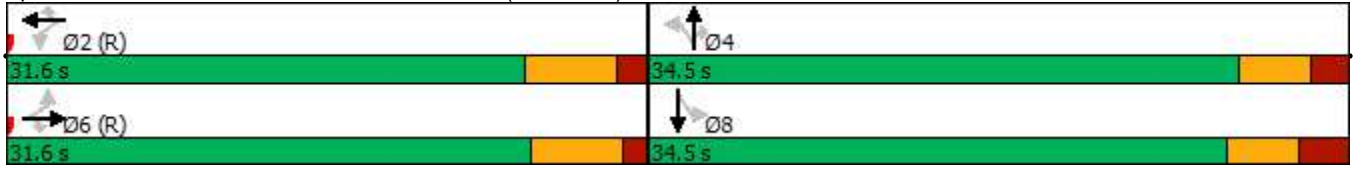
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	562	23	31	438	26	10	0	17	15	1	25
Future Volume (vph)	22	562	23	31	438	26	10	0	17	18	1	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	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	

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	0	-	0
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	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	870	1098	-
HCM Lane V/C Ratio	-	-	0.03	0.003	-
HCM Control Delay (s)	-	-	9.3	8.3	0
HCM Lane LOS	-	-	A	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	-	-	-

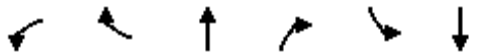
Intersection	
Int Delay, s/veh	0.1

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	-



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

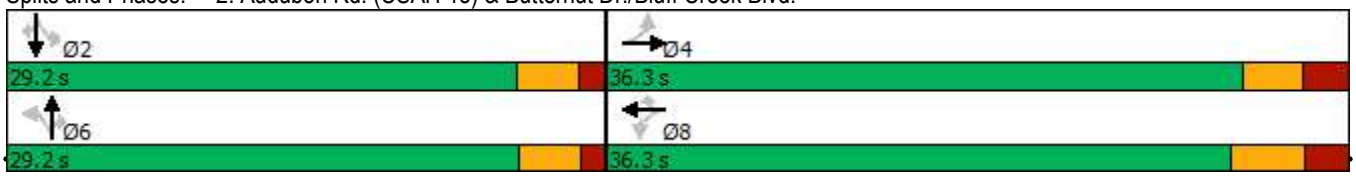
Network wide Queuing Penalty: 3

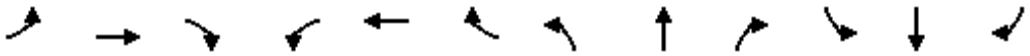
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	7	61	0	192	16	280	61	310	692	10
Future Volume (vph)	7	1	9	61	6	192	28	280	61	312	697	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	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	

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.



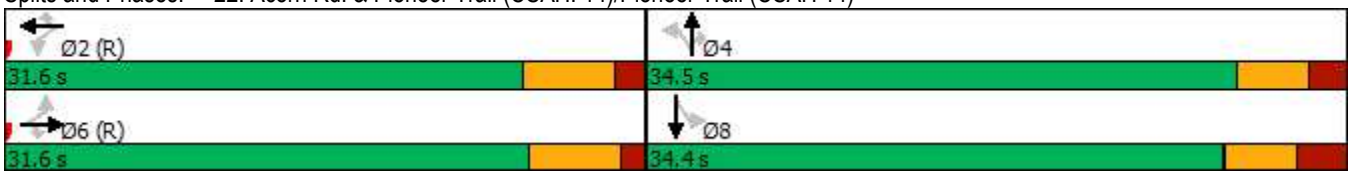


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	562	23	31	438	26	10	0	17	15	1	25
Future Volume (vph)	22	562	23	31	438	26	10	0	17	15	1	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	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
Frt			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	

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	0.84	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	0	-	0
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	0	63	0
Stage 1	45	-	-	-	-	-
Stage 2	46	-	-	-	-	-
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	914	804	-	-	1091	-
Stage 1	983	-	-	-	-	-
Stage 2	982	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	898	799	-	-	1084	-
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	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	881	1084	-
HCM Lane V/C Ratio	-	-	0.029	0.004	-
HCM Control Delay (s)	-	-	9.2	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	-	-	-

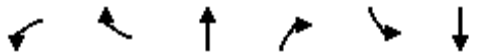
Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	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	-



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)	

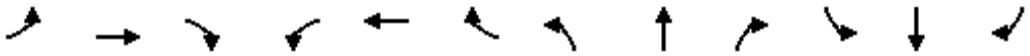
Intersection: 22: Acorn Rd. & Pioneer Trail (Co. Rd. 14)

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

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	

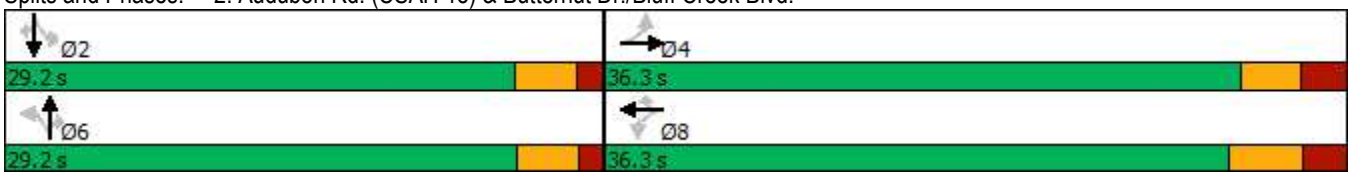


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			6			2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	6	6	6	2	2	2
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

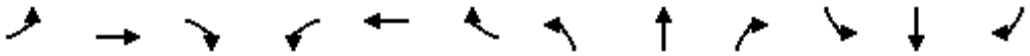
Intersection Summary	
Area Type:	Other
Cycle Length: 65.5	
Actuated Cycle Length: 45.8	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.65	

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.



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
Frt			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	

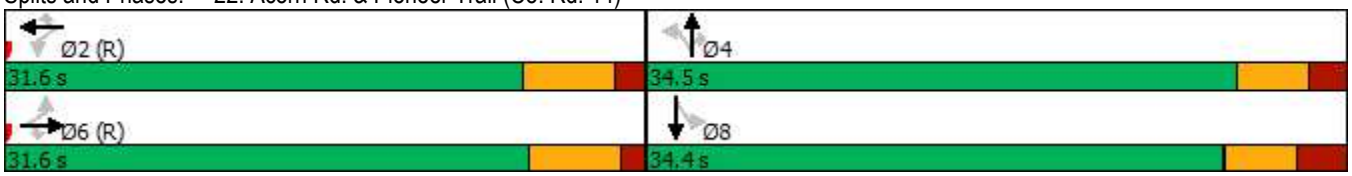


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	6		6	2		2	4		4	8		
Detector Phase	6	6	6	2	2	2	4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	8.0	8.0	5.0	5.0	
Minimum Split (s)	25.8	25.8	25.8	30.1	30.1	30.1	34.5	34.5	34.5	24.1	24.1	
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			

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	NBR	WBLn1	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	-

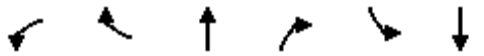
Intersection	
Int Delay, s/veh	4.3

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	-	-	-

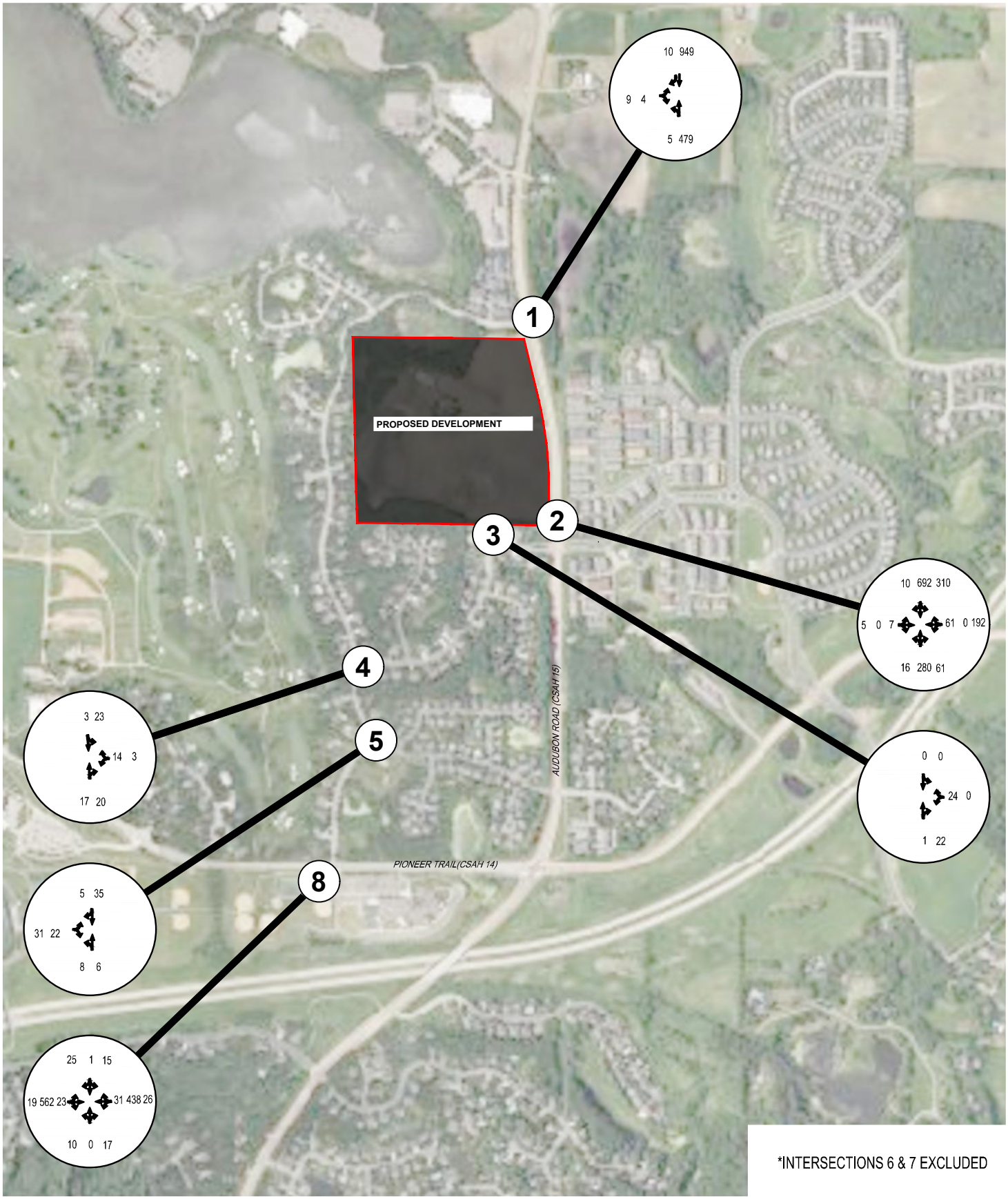


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	24	0	1	22	0	0
Future Volume (vph)	24	42	4	22	25	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	8	14	8	8	14
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.914		0.884			
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

7.A. PUBLIC HEARING: Recommend... Packet Page 315 of...



*INTERSECTIONS 6 & 7 EXCLUDED

NO BUILD (2043) VOLUMES

0 500 1000
SCALE: 1" =1000FEET

ISG
Architecture + Engineering + Environmental + Planning

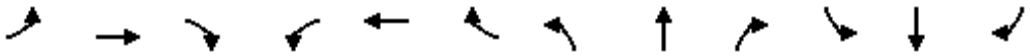
The Reserve at Autumn Woods
Chaska, MN - 09/03/2021
ISG PROJECT NO. 2021-24984

CAD FILE NAME: A984 TIS EXHIBITS

Appendix S: No Build (2043) Synchro Analysis Worksheets

7.A. PUBLIC HEARING: Recommend... Packet Page 317 of...

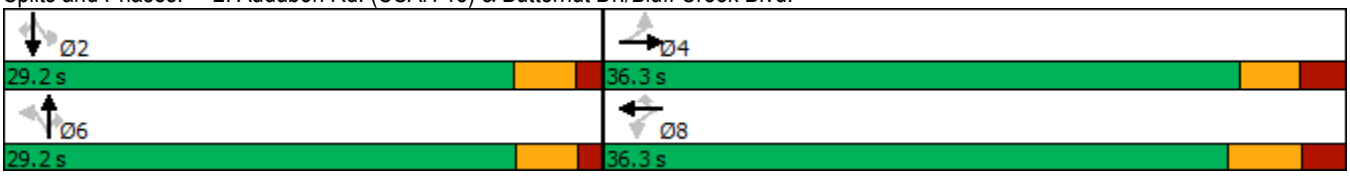
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	7	61	0	192	16	280	61	310	692	10
Future Volume (vph)	5	0	7	61	0	192	16	280	61	310	692	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	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	

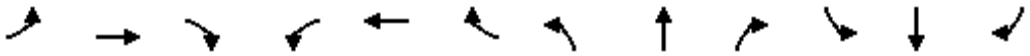


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm		Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			6			2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	6	6	6	2	2	2
Switch 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.			

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





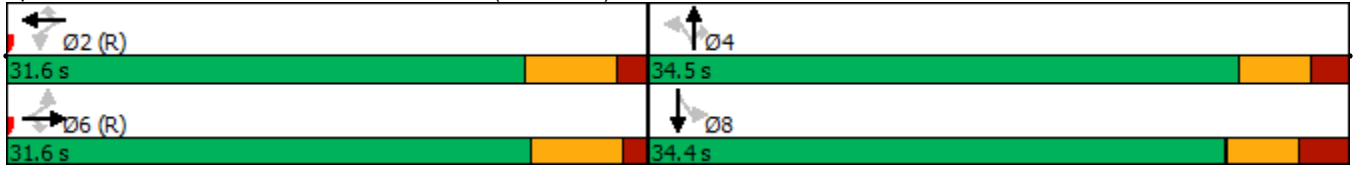
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	562	23	31	438	26	10	0	17	25	1	15
Future Volume (vph)	19	562	23	31	438	26	10	0	17	25	1	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	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	

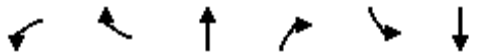
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	6		6	2		2	4		4	8		
Detector Phase	6	6	6	2	2	2	4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	8.0	8.0	5.0	5.0	
Minimum Split (s)	25.8	25.8	25.8	30.1	30.1	30.1	34.5	34.5	34.5	24.1	24.1	
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)





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	SBR
Lane 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	0	58	0
Stage 1	42	-	-	-	-	-
Stage 2	46	-	-	-	-	-
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	918	808	-	-	1097	-
Stage 1	986	-	-	-	-	-
Stage 2	982	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	901	803	-	-	1090	-
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	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	883	1090	-
HCM Lane V/C Ratio	-	-	0.027	0.004	-
HCM Control Delay (s)	-	-	9.2	8.3	0
HCM Lane LOS	-	-	A	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

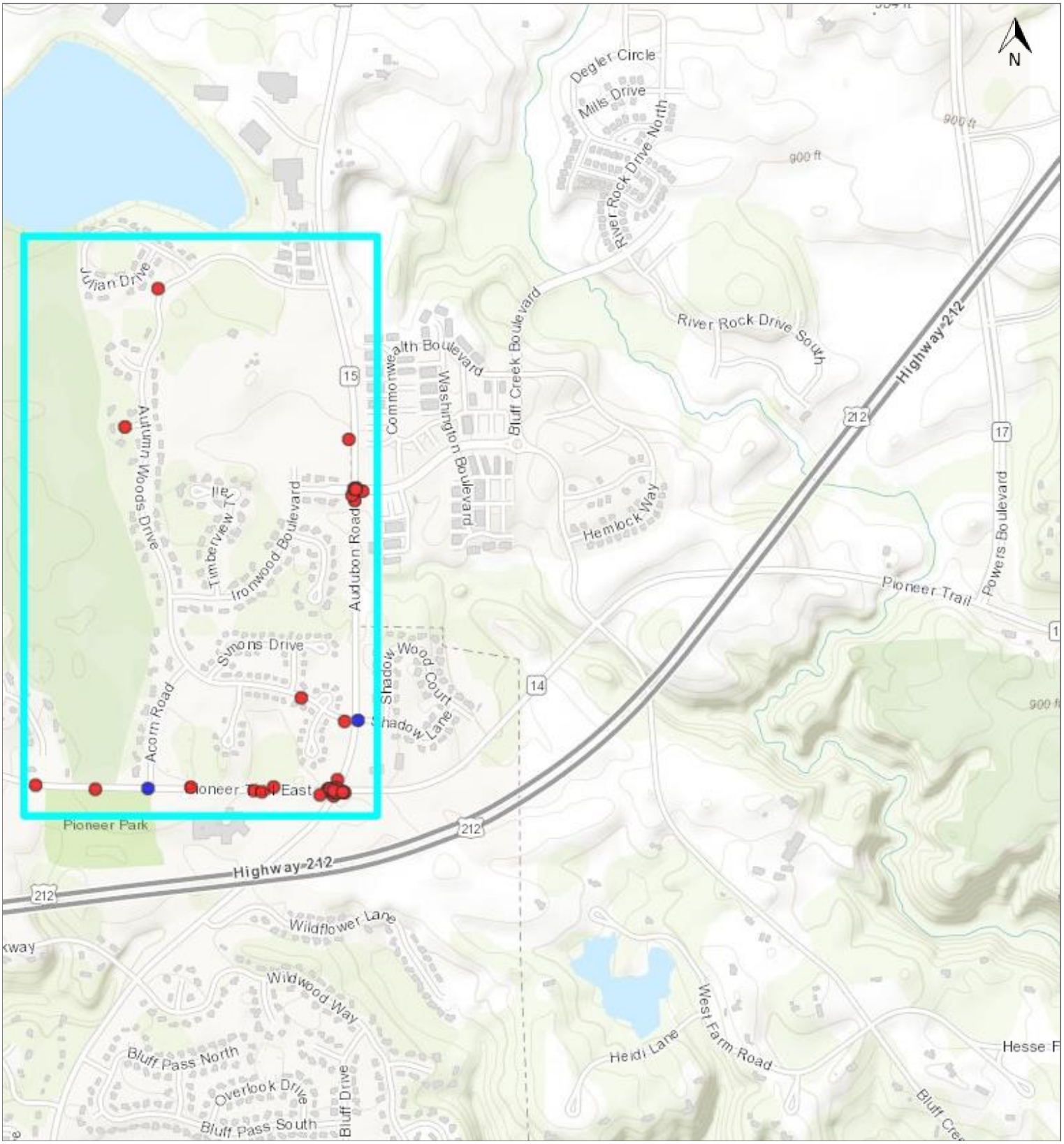
Lane	NELn1	NWLn1	SELn1
Vol Left, %	58%	57%	0%
Vol Thru, %	0%	43%	12%
Vol Right, %	42%	0%	88%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	53	14	40
LT Vol	31	8	0
Through Vol	0	6	5
RT Vol	22	0	35
Lane Flow Rate	53	14	40
Geometry Grp	1	1	1
Degree of Util (X)	0.058	0.016	0.039
Departure Headway (Hd)	3.929	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

7.A. PUBLIC HEARING: Recommend... Packet Page 328 of...
Page 323 of...

Crash Map

Map Version 1.0
June 2021



Notes:

LENNAR

DISCOVERY SERIES
EK04 A2 - ALEXANDER

INDEX

A1	ELEVATIONS, ROOF PLAN, NOTES
A2	FOUNDATION PLAN & DETAILS
A3	MAIN AND UPPER FLOOR PLANS
A4	SECTIONS
A5	ELECTRICAL PLANS
A6	DETAILS
F1	FIREPLACE DETAILS
L1	LOWER LEVEL FINISH OPTIONS
TW1	TALL WALL DETAILS
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.

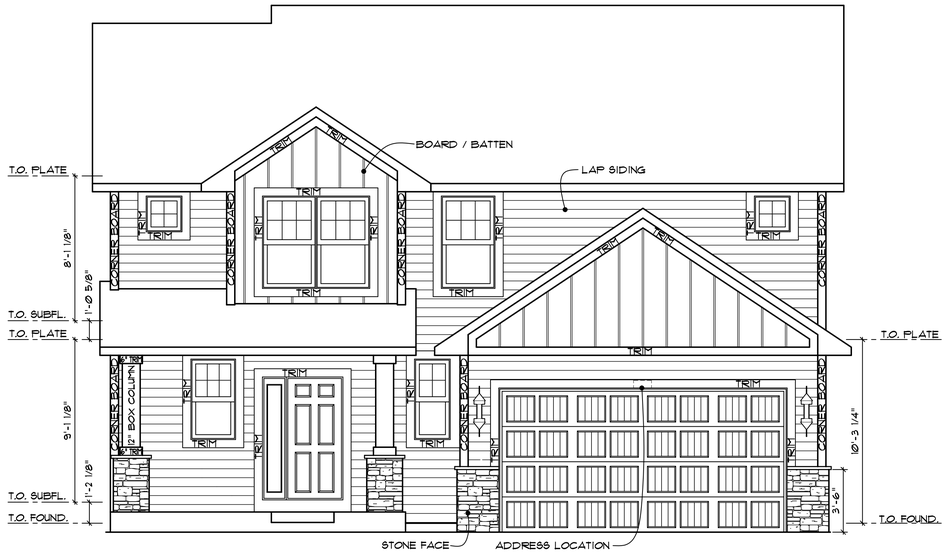
REPLACE 1/2" BUILT-RITE SHEATHING WITH 1/2" O.S.B. SHEATHING BEHIND ALL VINYL AND LP BOARD & BATTEN AND / OR SHAKE SIDING.

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



1 / A1 FRONT ELEVATION
SCALE: 1/4" = 1'-0"

ROOF VENT INSTALLATION NOTES:

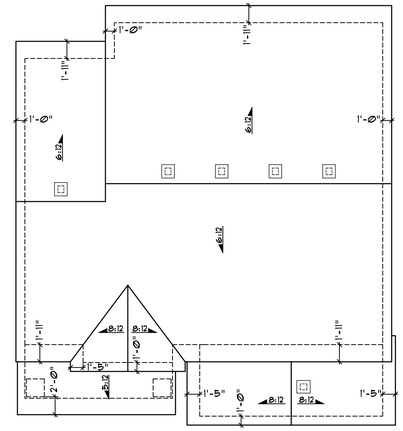
1. ALL ROOF VENTS TO BE INSTALLED OVER 8" WIDE x 9" HIGH OPENINGS INTO THE ROOF SHEATHING.

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.

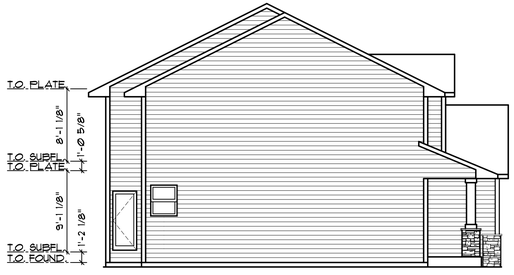
3. HIP ROOFS MAY REQUIRE THE OPNG'S TO BE CUT FURTHER DOWN FROM ROOF RIDGE TO ALIGN W/ REQUIRED SIDE ROOF VENTS. SEE ROOF PLAN.

4. ROOF SHEATHING TO BE REMOVED FROM UNDERNEATH OVER-FRAMED OR PERPENDICULAR ROOF SYSTEMS FOR PROPER AIR MOVEMENT.

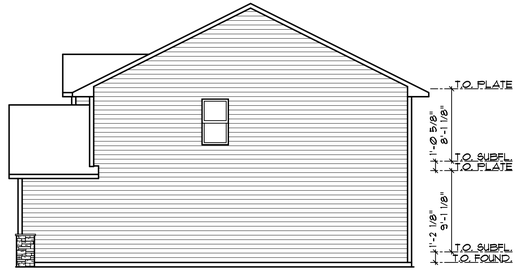
5. NO ROOF VENT OPENINGS WITHIN 36" OF ANY VALLEY'S.



2 / A1 ROOF PLAN
SCALE: 1/8" = 1'-0"



3 / A1 SIDE ELEVATION
SCALE: 1/8" = 1'-0"



4 / A1 SIDE ELEVATION
SCALE: 1/8" = 1'-0"



5 / A1 REAR ELEVATION
SCALE: 1/8" = 1'-0"



5A / A1 LOOKOUT ELEVATION
SCALE: 1/8" = 1'-0"



5B / A1 WALKOUT ELEVATION
SCALE: 1/8" = 1'-0"

DATE: MARCH 2019
DRAWN BY:
REVISED: 05-01-2021
REVISED:
REVISED:

UNAUTHORIZED USE OF THIS PLAN IS A VIOLATION OF THE U.S. COPYRIGHT ACT, TITLE 17, OF THE U.S. CODE.

LENNAR

OWNER:
PROJECT ADDRESS: EK04 A2 - ALEXANDER GARAGE BUMP OPTION
DEVELOPMENT:

LOT NO.
BLOCK NO.
ADDITION NO.

PN:
TITLE: ELEV
SHEET: A1

LENNAR

DISCOVERY SERIES
EK05 A2 - LEWIS

INDEX

A1	ELEVATIONS, ROOF PLAN, NOTES
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
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:	1,226 SQ. FT.
MAIN FLOOR FINISHED:	1,226 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.

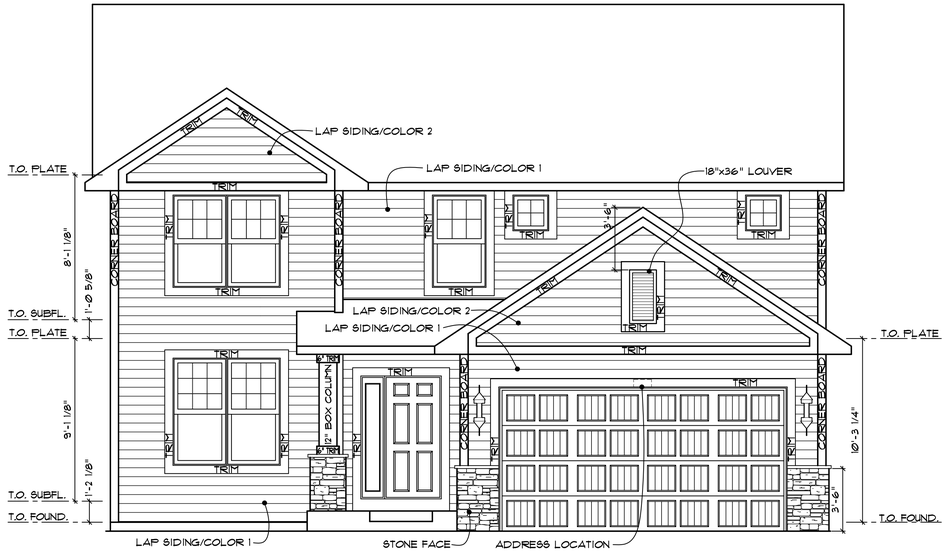
REPLACE 1/2" BUILT-RITE SHEATHING WITH 1/2" O.S.B. SHEATHING BEHIND ALL VINYL AND LP BOARD & BATTEN AND / OR SHAKE SIDING.

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

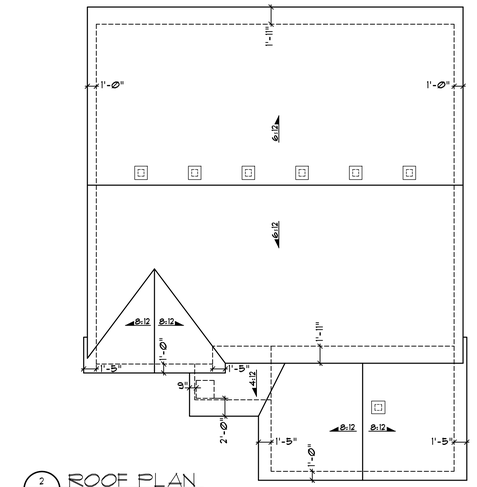
INSTALL HOUSE WRAP AROUND ENTIRE HOME, SEE DETAIL ON A4 FOR INSTRUCTIONS ON WRAPPING THE WINDOWS



1 / A1 FRONT ELEVATION
SCALE: 1/4" = 1'-0"

ROOF VENT INSTALLATION NOTES:

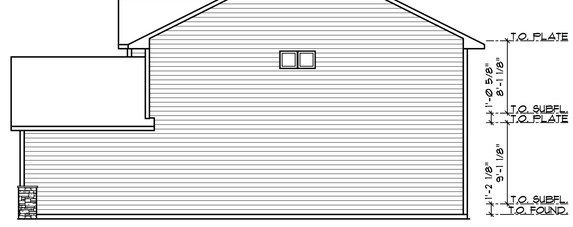
1. ALL ROOF VENTS TO BE INSTALLED OVER 8" WIDE x 9" HIGH OPENINGS INTO THE ROOF SHEATHING.
2. STANDARD LOCATION OF ROOF VENTS ON GABLE ROOFS TO BE 12" DOWN FROM THE ROOF RIDGE TO THE TOP OF THE 8"x9" OPENING.
3. HIP ROOFS MAY REQUIRE THE OPNG'S, TO BE CUT FURTHER DOWN FROM ROOF RIDGE TO ALIGN W/ REQUIRED 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 VALLEY'S.



2 / A1 ROOF PLAN
SCALE: 1/8" = 1'-0"



3 / A1 SIDE ELEVATION
SCALE: 1/8" = 1'-0"



4 / A1 SIDE ELEVATION
SCALE: 1/8" = 1'-0"



5 / A1 REAR ELEVATION
SCALE: 1/8" = 1'-0"



5A / A1 LOOKOUT ELEVATION
SCALE: 1/8" = 1'-0"



5B / A1 WALKOUT ELEVATION
SCALE: 1/8" = 1'-0"

DATE: JANUARY 2019
DRAWN BY:
REVISED: 05-01-2021
REVISED:
REVISED:

UNAUTHORIZED USE OF THIS PLAN IS A VIOLATION OF THE U.S. COPYRIGHT ACT, TITLE 17, OF THE U.S. CODE.

LENNAR

GARAGE BUMP OPTION

OWNER:
EK05 A2 - LEWIS
PROJECT ADDRESS:
DEVELOPMENT:

LOT NO.
BLOCK NO.
ADDITION NO.

PN:
TITLE: ELEV
SHEET: A1

LENNAR

DISCOVERY SERIES
EK02 B2W-VANDERBILT-2 CAR GARAGE

INDEX

A1	ELEVATIONS, ROOF PLAN, NOTES
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
TW1	TALL WALL DETAILS
S1	STRUCTURAL DETAILS
S2	STRUCTURAL DETAILS
S3	BRACED WALL DETAILS
S4	BRACED WALL DETAILS

SQUARE FOOTAGES

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

EXTERIOR NOTES

SIDING MATERIALS PER COMMUNITY SPECIFICATIONS.
STYLE PER PLAN.

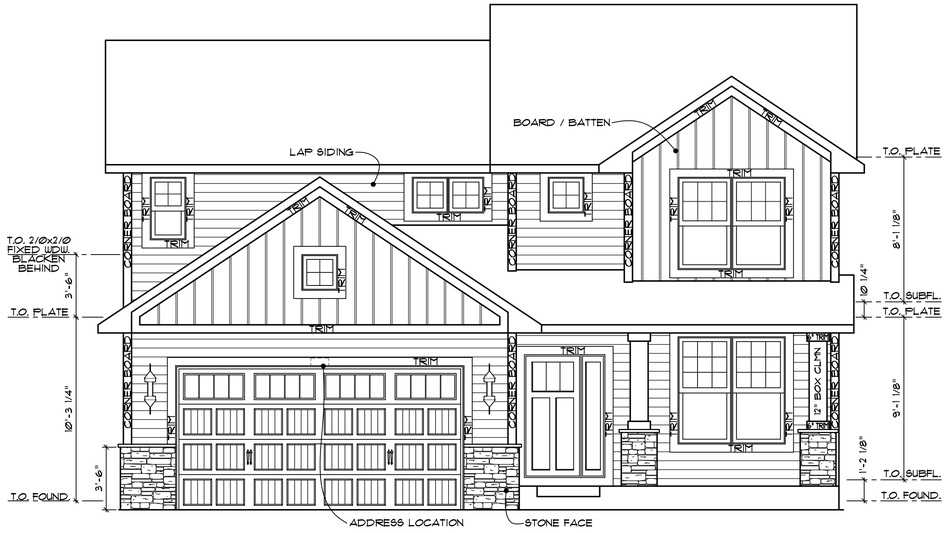
REPLACE 1/2" BUILT-RITE SHEATHING WITH 1/2" O.S.B. SHEATHING BEHIND ALL VINYL AND LP BOARD & BATTEN AND / OR SHAKE SIDING.

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

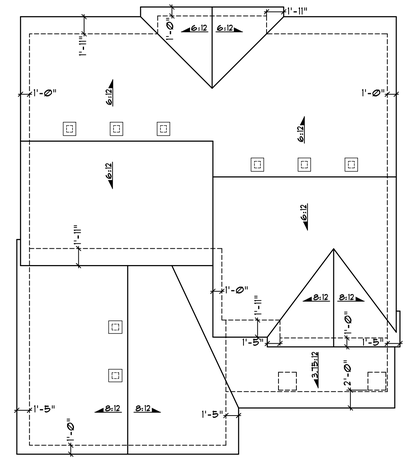
INSTALL HOUSE WRAP AROUND ENTIRE HOME, SEE DETAIL ON A4 FOR INSTRUCTIONS ON WRAPPING THE WINDOWS



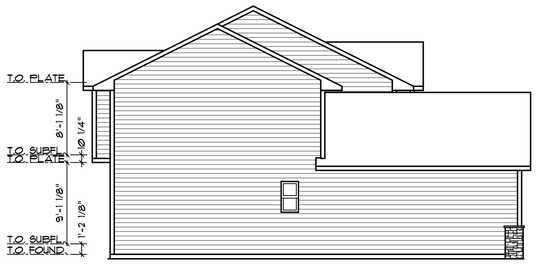
1 / A1 FRONT ELEVATION
SCALE: 1/4" = 1'-Ø"

ROOF VENT INSTALLATION NOTES:

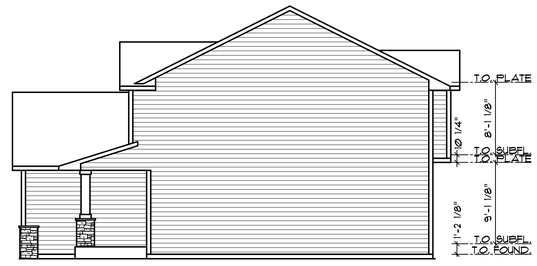
1. ALL ROOF VENTS TO BE INSTALLED OVER 8" WIDE x 5" HIGH OPENINGS INTO THE ROOF SHEATHING.
2. STANDARD LOCATION OF ROOF VENTS ON GABLE ROOFS TO BE 12" DOWN FROM THE ROOF RIDGE TO THE TOP OF THE 8"x5" OPENING.
3. HIP ROOFS MAY REQUIRE THE OPNG'S TO BE CUT FURTHER DOWN FROM ROOF RIDGE TO ALIGN W/ REQUIRED 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 VALLEY'S.



2 / A1 ROOF PLAN
SCALE: 1/8" = 1'-Ø"



3 / A1 SIDE ELEVATION
SCALE: 1/8" = 1'-Ø"



4 / A1 SIDE ELEVATION
SCALE: 1/8" = 1'-Ø"



5 / A1 REAR ELEVATION
SCALE: 1/8" = 1'-Ø"



5A / A1 LOOKOUT ELEVATION
SCALE: 1/8" = 1'-Ø"



5B / A1 WALKOUT ELEVATION
SCALE: 1/8" = 1'-Ø"

DATE: FEBRUARY 2019
DRAWN BY:
REVISED: 05-01-2021
REVISED:
REVISED:

UNAUTHORIZED USE OF THIS PLAN IS A VIOLATION OF THE U.S. COPYRIGHT ACT, TITLE 17, OF THE U.S. CODE.

LENNAR

OWNER:
EK02 B2W - VANDERBILT
PROJECT ADDRESS:
DEVELOPMENT:

LOT NO.
BLOCK NO.
ADDITION NO.

PN:
TITLE: ELEV
SHEET: A1

LENNAR

E1 DISCOVERY SERIES
EK05 B4 - LEWIS - 4 CAR GARAGE

INDEX

A1	ELEVATIONS, ROOF PLAN, NOTES
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
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:	1,226 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.

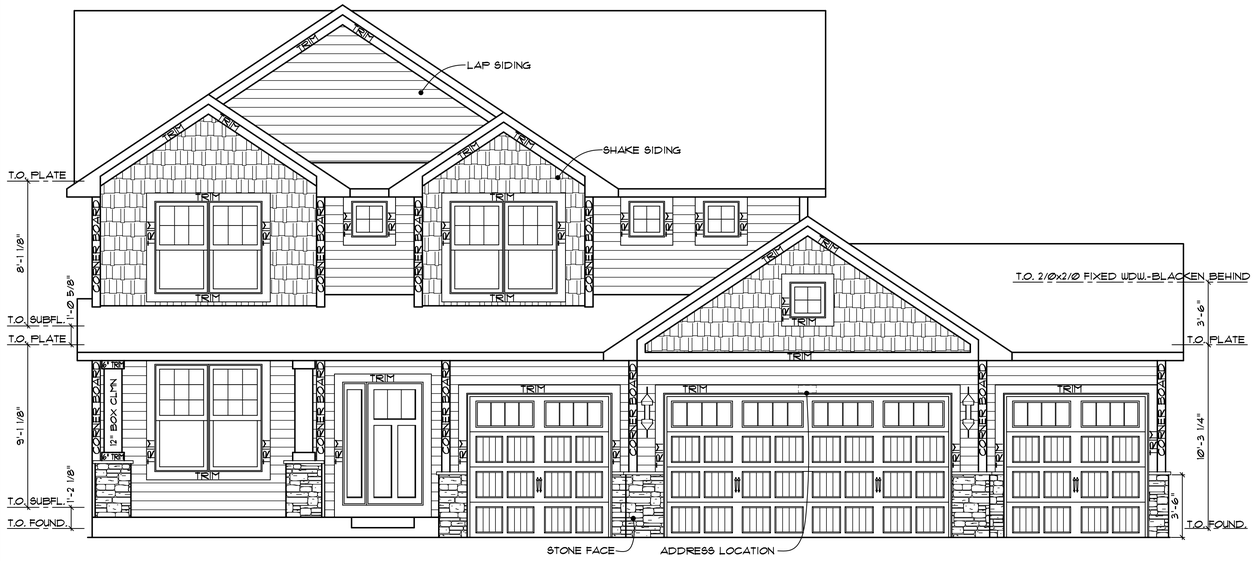
REPLACE 1/2" BUILT-RITE SHEATHING WITH 1/2" O.S.B. SHEATHING BEHIND ALL VINYL AND LP BOARD & BATTEN AND / OR SHAKE SIDING.

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

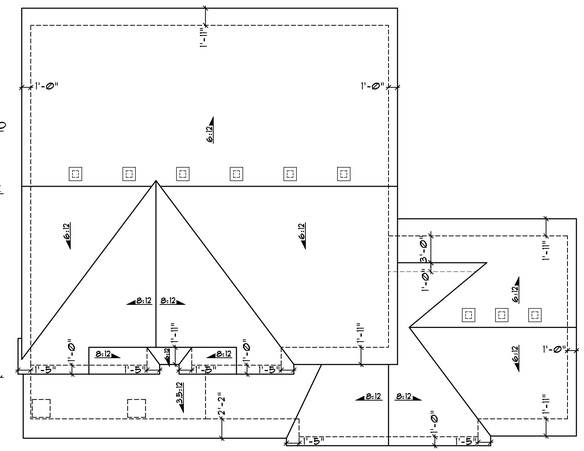
INSTALL HOUSE WRAP AROUND ENTIRE HOME, SEE DETAIL ON A4 FOR INSTRUCTIONS ON WRAPPING THE WINDOWS



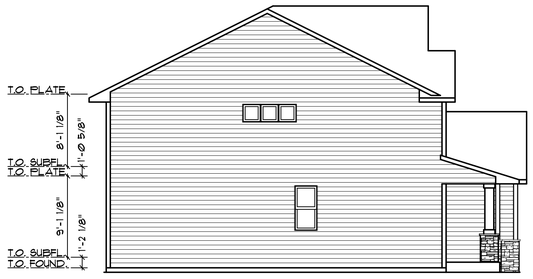
1 A1 FRONT ELEVATION
SCALE: 1/4" = 1'-0"

ROOF VENT INSTALLATION NOTES:

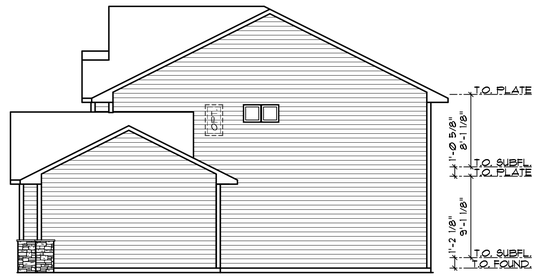
1. ALL ROOF VENTS TO BE INSTALLED OVER 8" WIDE x 9" HIGH OPENINGS INTO THE ROOF SHEATHING.
2. STANDARD LOCATION OF ROOF VENTS ON GABLE ROOFS TO BE 12" DOWN FROM THE ROOF RIDGE TO THE TOP OF THE 8"x9" OPENING.
3. HIP ROOFS MAY REQUIRE THE OPNG'S. TO BE CUT FURTHER DOWN FROM ROOF RIDGE TO ALIGN W/ REQUIRED 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 VALLEY'S.



2 A1 ROOF PLAN
SCALE: 1/8" = 1'-0"



3 A1 SIDE ELEVATION
SCALE: 1/8" = 1'-0"



4 A1 SIDE ELEVATION
SCALE: 1/8" = 1'-0"



5 A1 REAR ELEVATION
SCALE: 1/8" = 1'-0"



5A A1 LOOKOUT ELEVATION
SCALE: 1/8" = 1'-0"



5B A1 WALKOUT ELEVATION
SCALE: 1/8" = 1'-0"

DATE: JANUARY 2019
DRAWN BY:
REVISED: 05-01-2021
REVISED:
REVISED:

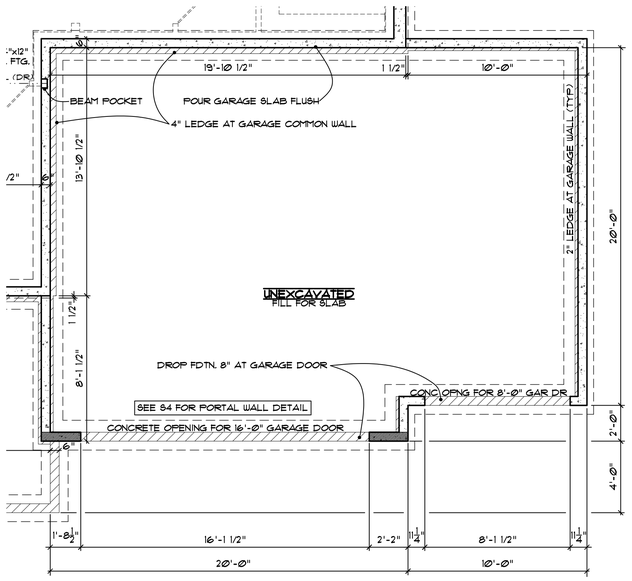
UNAUTHORIZED USE OF THIS PLAN IS A VIOLATION OF THE U.S. COPYRIGHT ACT, TITLE 17, OF THE U.S. CODE.

LENNAR

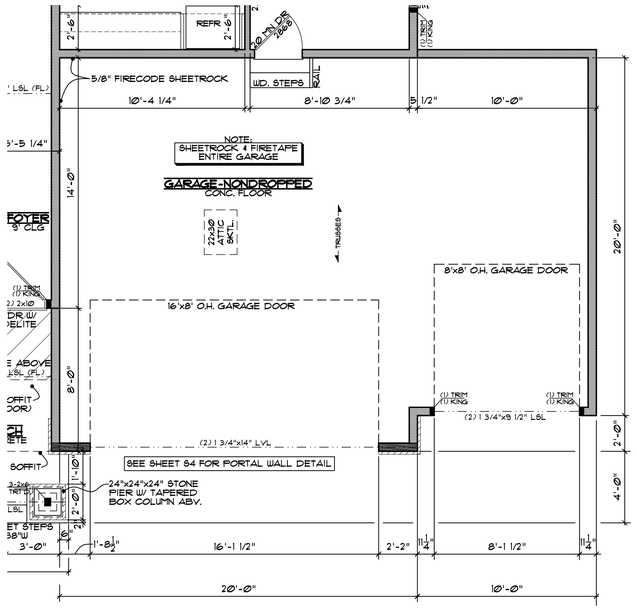
OWNER:
PROJECT ADDRESS: EK05 B4 - LEWIS
DEVELOPMENT:

LOT NO.
BLOCK NO.
ADDITION NO.

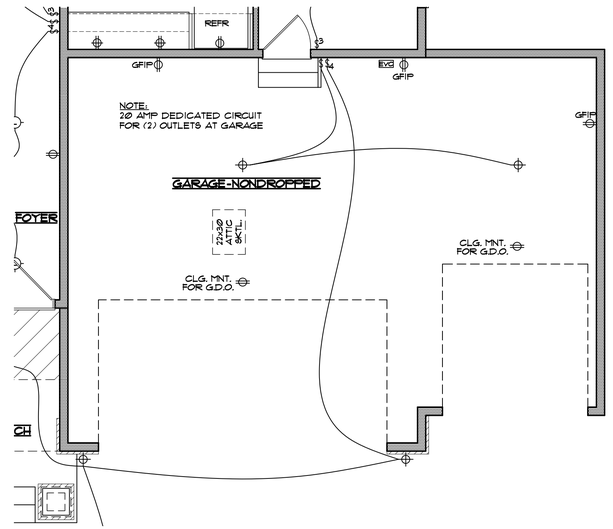
PN:
TITLE: ELEV
SHEET: A1



1 / A8 4 CAR GARAGE FOUNDATION PLAN
SCALE: 1/4" = 1'-Ø"



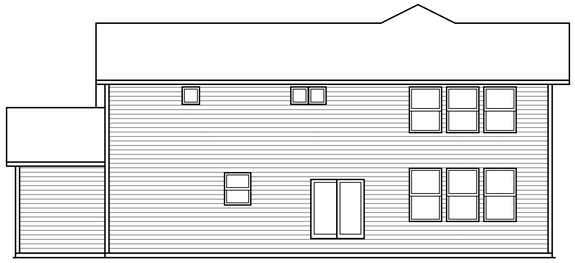
2 / A8 4 CAR GARAGE FLOOR PLAN
SCALE: 1/4" = 1'-Ø"



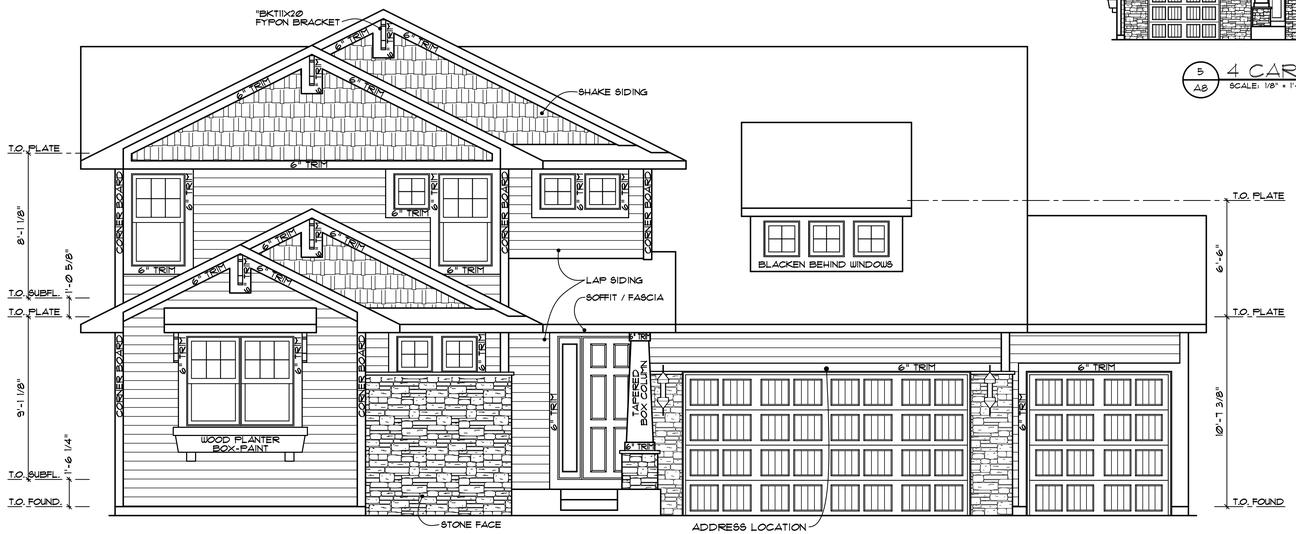
3 / A8 4 CAR GARAGE ELECTRICAL PLAN
SCALE: 1/4" = 1'-Ø"



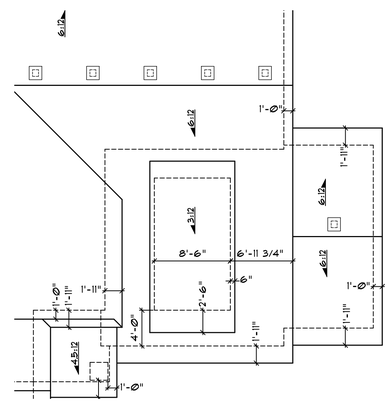
5 / A8 4 CAR GARAGE SIDE ELEVATION
SCALE: 1/8" = 1'-Ø"



6 / A8 4 CAR GARAGE REAR ELEVATION
SCALE: 1/8" = 1'-Ø"



4 / A8 4 CAR GARAGE FRONT ELEVATION
SCALE: 1/4" = 1'-Ø"



7 / A8 4 CAR GARAGE ROOF PLAN
SCALE: 1/8" = 1'-Ø"

UNAUTHORIZED USE OF THIS PLAN IS A VIOLATION OF THE U.S. COPYRIGHT ACT, TITLE 17, OF THE U.S. CODE.

DATE: JULY 2019
DRAWN BY:
REVISED: 05-01-2021
REVISED:
REVISED:

LENNAR

OWNER:
PROJECT ADDRESS: EM01 A - INDEPENDENCE
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

INDEX

A1	ELEVATIONS, ROOF PLAN, NOTES
A2	FOUNDATION PLAN & DETAILS
A3	MAIN FLOOR PLAN & OPTIONS
A4	UPPER FLOOR PLAN & OPTIONS
A5	SECTIONS
A6	ELECTRICAL PLANS
A7	DETAILS
A8	4-SEASON PORCH OPTION
F1	FIREPLACE DETAILS
L1	LOWER LEVEL FINISH PLANS
S1	STRUCTURAL DETAILS
S2	STRUCTURAL DETAILS
SA1	FOUNDATION FOOTINGS
S3	BRACED WALL DETAILS
S4	BRACED WALL DETAILS
S5	4-SEASON PORCH OPTION

SQUARE FOOTAGES

STOOP:	157 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.

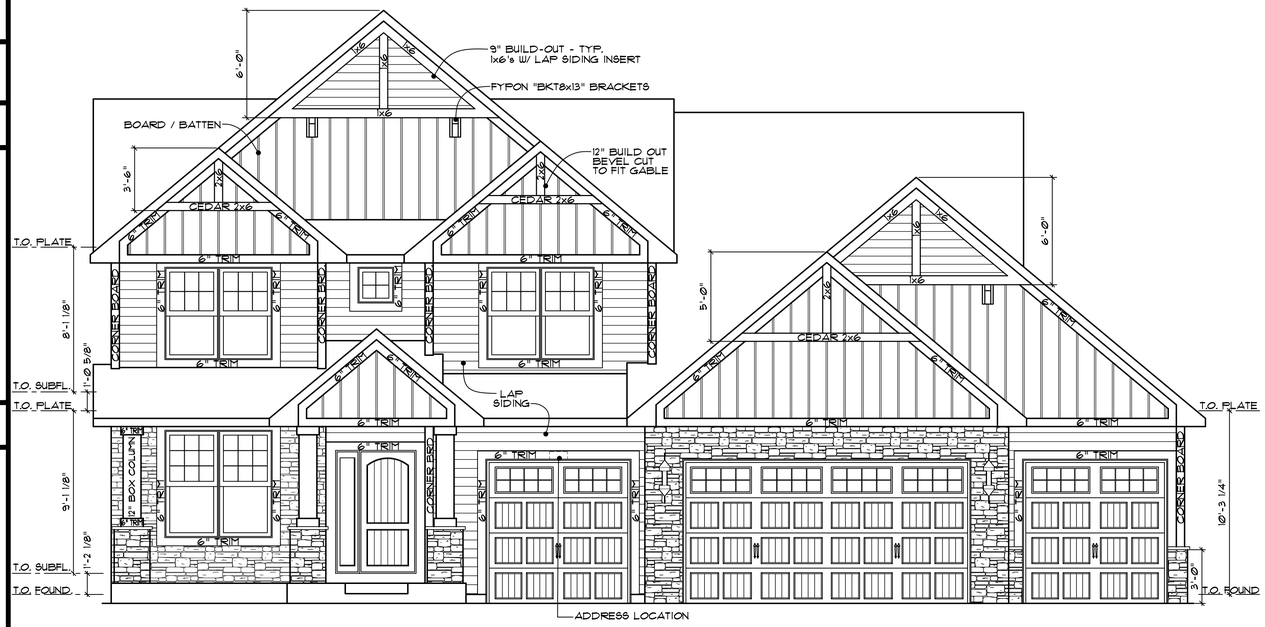
REPLACE 1/2" BUILT-RITE SHEATHING WITH 1/2" O.S.B. SHEATHING BEHIND ALL VINYL AND LP BOARD & BATTEN AND / OR SHAKE SIDING.

ALUMINUM FASCIA & SOFFIT ON ALL SIDES OF HOME, INCLUDES PORCH CEILING

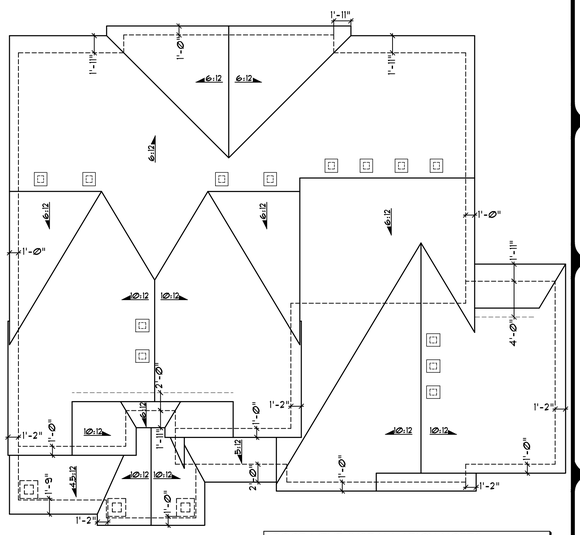
ALL TRIM MATERIALS SHOWN TO BE PER COMMUNITY SPEC'S. TRIM SIZED PER PLAN.

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



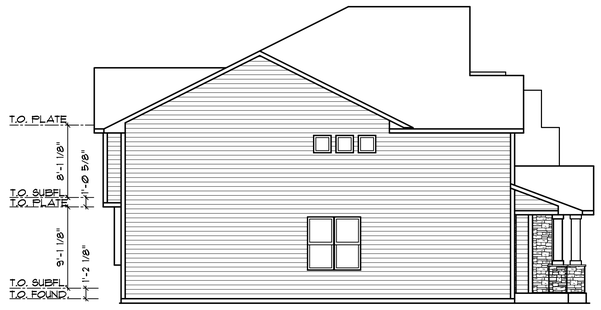
1/A1 FRONT ELEVATION
SCALE: 1/4" = 1'-Ø"



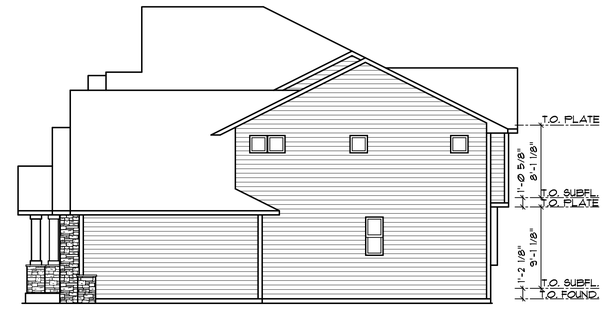
2/A1 ROOF PLAN
SCALE: 1/8" = 1'-Ø"

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 VALLEY'S.



3/A1 SIDE ELEVATION
SCALE: 1/8" = 1'-Ø"



4/A1 SIDE ELEVATION
SCALE: 1/8" = 1'-Ø"



5/A1 REAR ELEVATION
SCALE: 1/8" = 1'-Ø"



5A/A1 LOOKOUT ELEVATION
SCALE: 1/8" = 1'-Ø"



5B/A1 WALKOUT ELEVATION
SCALE: 1/8" = 1'-Ø"

DATE: JANUARY 2020
DRAWN BY:
REVISED: 05-01-2021
REVISED:
REVISED:

UNAUTHORIZED USE OF THIS PLAN IS A VIOLATION OF THE U.S. COPYRIGHT ACT, TITLE 17, OF THE U.S. CODE.

LENNAR

OWNER:
EH06 D4 - SNELLING
PROJECT ADDRESS:
DEVELOPMENT:

LOT NO.
BLOCK NO.
ADDITION NO.

PN:
TITLE: ELEV
SHEET: A1

LENNAR

DISCOVERY SERIES
EK05 D4 - LEWIS - 4 CAR GARAGE

INDEX

A1	ELEVATIONS, ROOF PLAN, NOTES
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
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:	1,226 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.

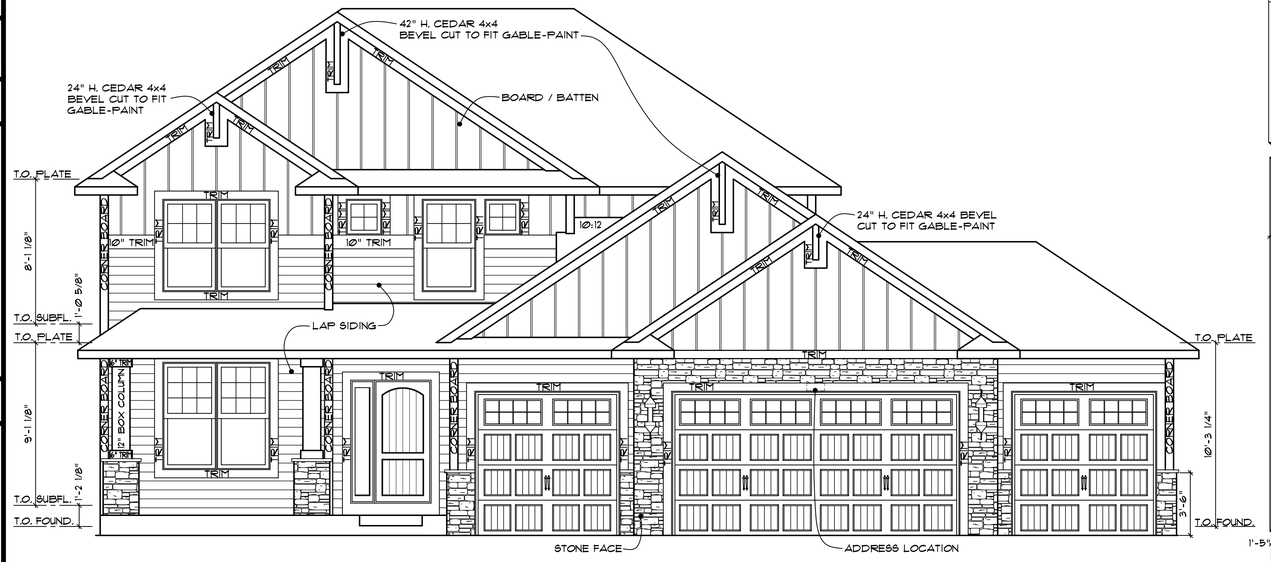
REPLACE 1/2" BUILT-RITE SHEATHING WITH 1/2" O.S.B. SHEATHING BEHIND ALL VINYL AND LP BOARD & BATTEN AND / OR SHAKE SIDING.

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

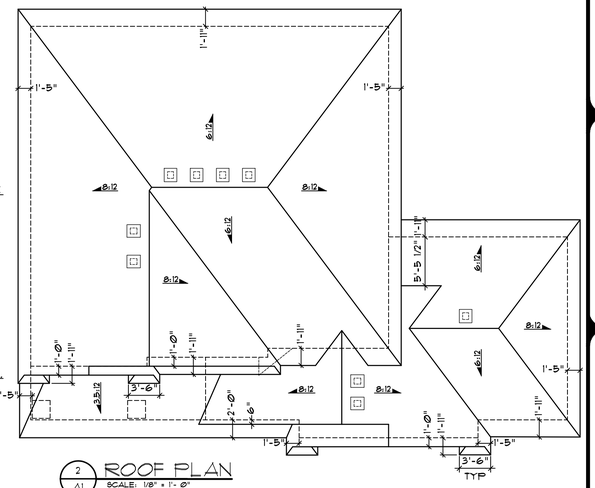
INSTALL HOUSE WRAP AROUND ENTIRE HOME, SEE DETAIL ON A4 FOR INSTRUCTIONS ON WRAPPING THE WINDOWS



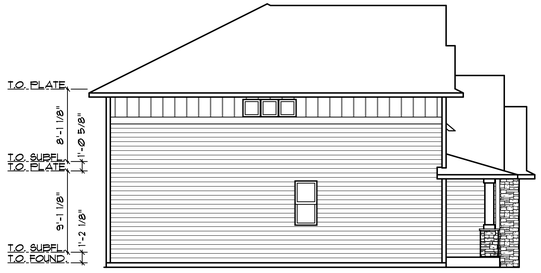
1 / A1 FRONT ELEVATION
SCALE: 1/4" = 1'-0"

ROOF VENT INSTALLATION NOTES:

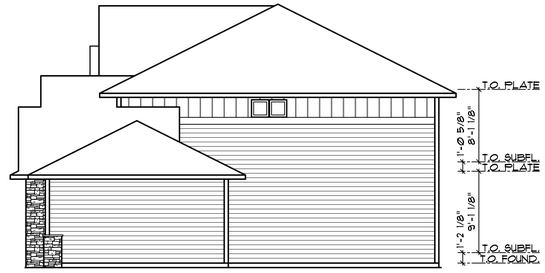
1. ALL ROOF VENTS TO BE INSTALLED OVER 8" WIDE x 9" HIGH OPENINGS INTO THE ROOF SHEATHING.
2. STANDARD LOCATION OF ROOF VENTS ON GABLE ROOFS TO BE 12" DOWN FROM THE ROOF RIDGE TO THE TOP OF THE 8"x9" OPENING.
3. HIP ROOFS MAY REQUIRE THE OPNG'S. TO BE CUT FURTHER DOWN FROM ROOF RIDGE TO ALIGN W/ REQUIRED 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 VALLEY'S.



2 / A1 ROOF PLAN
SCALE: 1/8" = 1'-0"



3 / A1 SIDE ELEVATION
SCALE: 1/8" = 1'-0"



4 / A1 SIDE ELEVATION
SCALE: 1/8" = 1'-0"



5 / A1 REAR ELEVATION
SCALE: 1/8" = 1'-0"



5A / A1 LOOKOUT ELEVATION
SCALE: 1/8" = 1'-0"



5B / A1 WALKOUT ELEVATION
SCALE: 1/8" = 1'-0"

DATE: JANUARY 2019
DRAWN BY:
REVISED: 05-01-2021
REVISED:
REVISED:

UNAUTHORIZED USE OF THIS PLAN IS A VIOLATION OF THE U.S. COPYRIGHT ACT, TITLE 17, OF THE U.S. CODE.

LENNAR

OWNER:
PROJECT ADDRESS: EK05 D4 - LEWIS
DEVELOPMENT:

LOT NO.
BLOCK NO.
ADDITION NO.

PN:
TITLE: ELEV
SHEET: A1

LENNAR

LANDMARK SERIES
EH07 A4 - SUMMIT

INDEX

A1	ELEVATIONS, ROOF PLAN, NOTES
A2	FOUNDATION PLAN & DETAILS
A3	MAIN FLOOR PLAN & OPTIONS
A4	UPPER FLOOR PLAN & OPTIONS
A5	SECTIONS
A6	ELECTRICAL PLANS
A7	DETAILS
A8	4-SEASON PORCH OPTION
F1	FIREPLACE DETAILS
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.

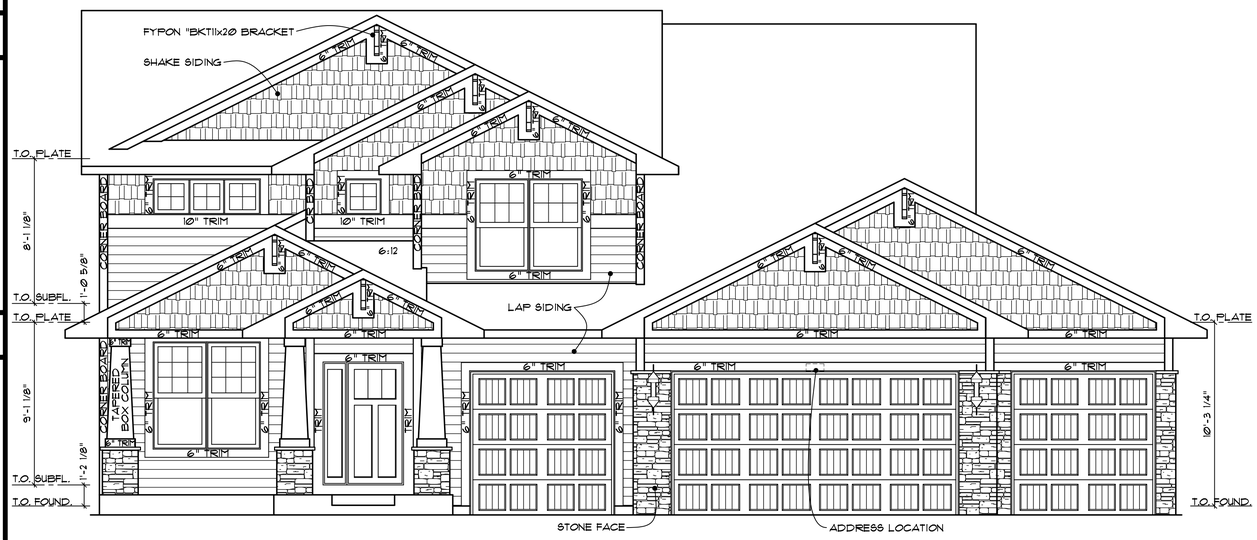
REPLACE 1/2" BUILT-RITE SHEATHING WITH 1/2" O.S.B. SHEATHING BEHIND ALL VINYL AND LP BOARD & BATTEN AND / OR SHAKE SIDING.

ALUMINUM FASCIA & SOFFIT ON ALL SIDES OF HOME, INCLUDES PORCH CEILING

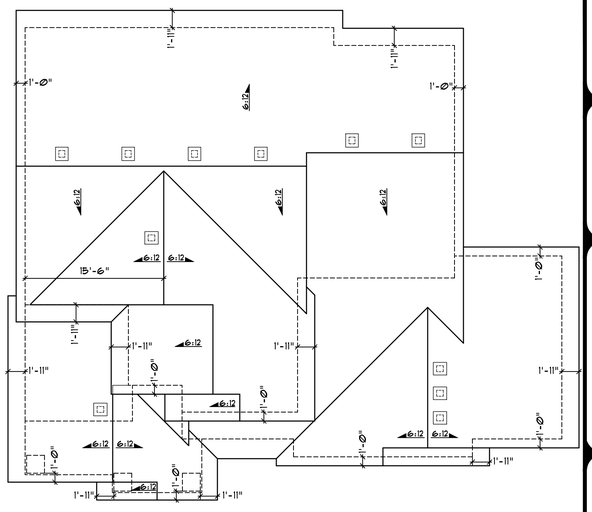
ALL TRIM MATERIALS SHOWN TO BE PER COMMUNITY SPEC'S. TRIM SIZED PER PLAN.

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 / A1 FRONT ELEVATION
SCALE: 1/4" = 1'- Ø"



2 / A1 ROOF PLAN
SCALE: 1/8" = 1'- Ø"

ROOF VENT INSTALLATION NOTES:

1. ALL ROOF VENTS TO BE INSTALLED OVER 8" WIDE x 5" 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"x5" OPENING.
3. HIP ROOFS MAY REQUIRE THE OPNGVL 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.



3 / A1 SIDE ELEVATION
SCALE: 1/8" = 1'- Ø"



4 / A1 SIDE ELEVATION
SCALE: 1/8" = 1'- Ø"



5 / A1 REAR ELEVATION
SCALE: 1/8" = 1'- Ø"



5A / A1 LOOKOUT ELEVATION
SCALE: 1/8" = 1'- Ø"



5B / A1 WALKOUT ELEVATION
SCALE: 1/8" = 1'- Ø"

DATE: FEBRUARY 2020
DRAWN BY:
REVISED: 05-01-2021
REVISED:
REVISED:

UNAUTHORIZED USE OF THIS PLAN IS A VIOLATION OF THE U.S. COPYRIGHT ACT, TITLE 17, OF THE U.S. CODE.

LENNAR

OWNER:
EH07 A4 - SUMMIT
PROJECT ADDRESS:
DEVELOPMENT:

LOT NO.
BLOCK NO.
ADDITION NO.

PN:
TITLE: ELEV
SHEET: A1

LENNAR

LANDMARK SERIES
EH06 G4 - SNELLING

INDEX

A1	ELEVATIONS, ROOF PLAN, NOTES
A2	FOUNDATION PLAN & DETAILS
A3	MAIN FLOOR PLAN & OPTIONS
A4	UPPER FLOOR PLAN & OPTIONS
A5	SECTIONS
A6	ELECTRICAL PLANS
A7	DETAILS
A8	4-SEASON PORCH OPTION
F1	FIREPLACE DETAILS
L1	LOWER LEVEL FINISH PLANS
S1	STRUCTURAL DETAILS
S2	STRUCTURAL DETAILS
SA1	FOUNDATION FOOTINGS
S3	BRACED WALL DETAILS
S4	BRACED WALL DETAILS
S5	4-SEASON PORCH OPTION

SQUARE FOOTAGES

STOOP:	161 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.

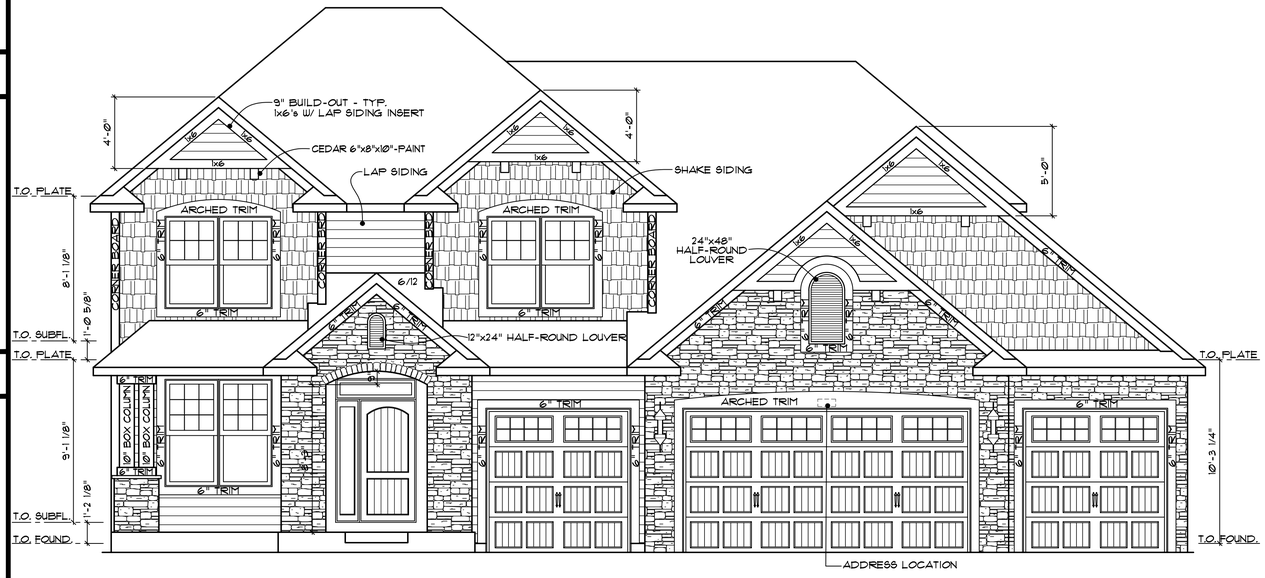
REPLACE 1/2" BUILT-RITE SHEATHING WITH 1/2" O.S.B. SHEATHING BEHIND ALL VINYL AND LP BOARD & BATTEN AND / OR SHAKE SIDING.

ALUMINUM FASCIA & SOFFIT ON ALL SIDES OF HOME, INCLUDES PORCH CEILING

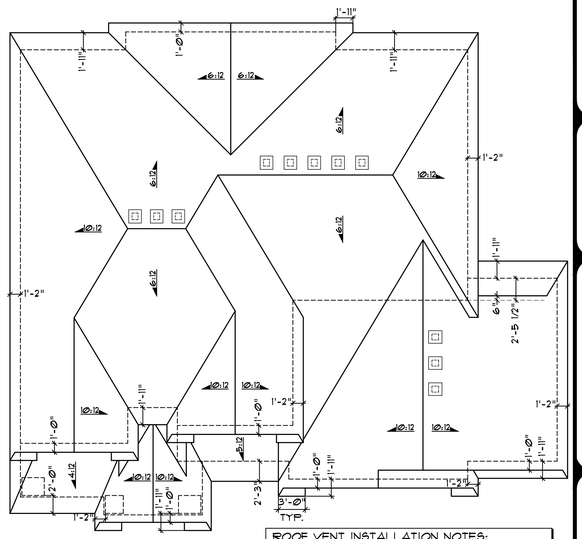
ALL TRIM MATERIALS SHOWN TO BE PER COMMUNITY SPEC'S. TRIM SIZED PER PLAN.

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 / A1 FRONT ELEVATION
SCALE: 1/4" = 1'-0"



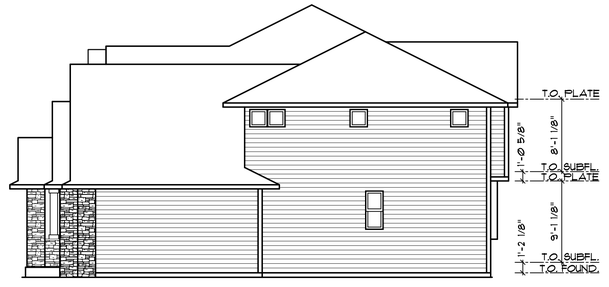
2 / A1 ROOF PLAN
SCALE: 1/8" = 1'-0"

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 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 VALLEY'S.



3 / A1 SIDE ELEVATION
SCALE: 1/8" = 1'-0"



4 / A1 SIDE ELEVATION
SCALE: 1/8" = 1'-0"



5 / A1 REAR ELEVATION
SCALE: 1/8" = 1'-0"



5A / A1 LOOKOUT ELEVATION
SCALE: 1/8" = 1'-0"



5B / A1 WALKOUT ELEVATION
SCALE: 1/8" = 1'-0"

DATE: JANUARY 2020
DRAWN BY:
REVISED: 05-01-2021
REVISED:
REVISED:

UNAUTHORIZED USE OF THIS PLAN IS A VIOLATION OF THE U.S. COPYRIGHT ACT, TITLE 17, OF THE U.S. CODE.

LENNAR

EH06 G4 - SNELLING

OWNER:
PROJECT ADDRESS:
DEVELOPMENT:

LOT NO.
BLOCK NO.
ADDITION NO.

PN:
TITLE: ELEV
SHEET: A1

LENNAR

LANDMARK SERIES
EHØ5 C4 - WASHBURN

INDEX

A1	ELEVATIONS, ROOF PLAN, NOTES
A2	FOUNDATION PLAN AND DETAILS
A3	MAIN FLOOR PLAN AND OPTIONS
A4	UPPER FLOOR PLAN AND OPTIONS
A5	SECTIONS
A6	ELECTRICAL PLANS
A7	DETAILS
A8	4-SEASON PORCH OPTION
F1	FIREPLACE DETAILS
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.

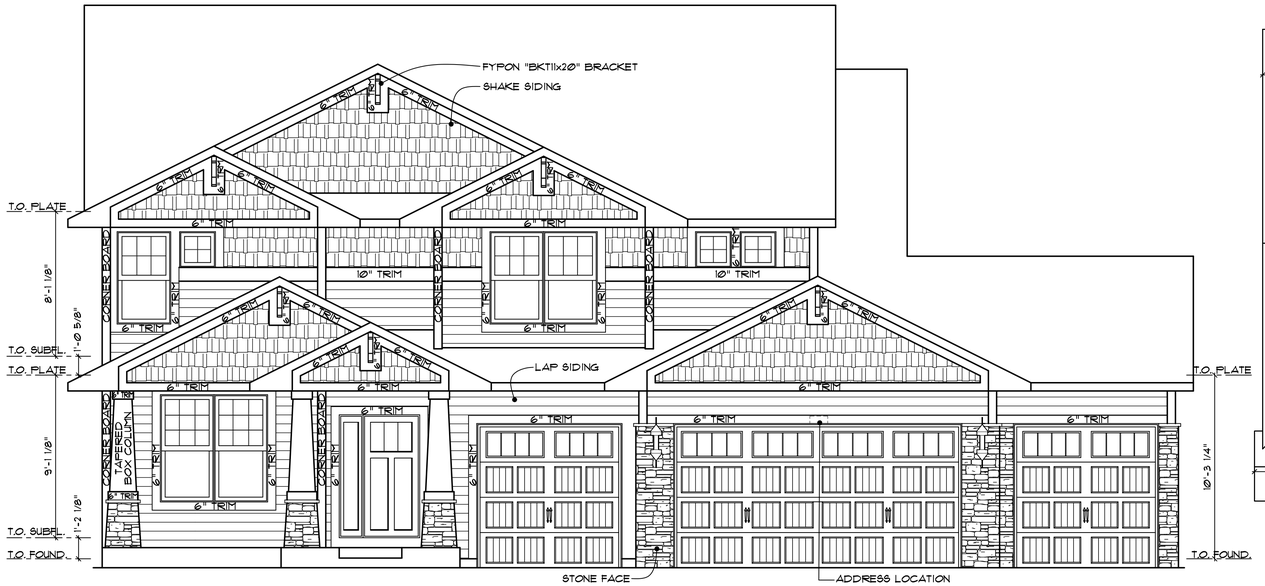
REPLACE 1/2" BUILT-RITE SHEATHING WITH 1/2" O.S.B. SHEATHING BEHIND ALL VINYL AND LP BOARD & BATTEN AND / OR SHAKE SIDING.

ALUMINUM FASCIA & SOFFIT ON ALL SIDES OF HOME, INCLUDES PORCH CEILING

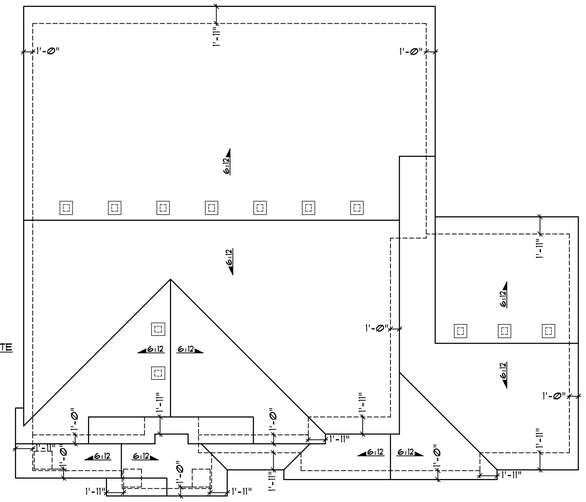
ALL TRIM MATERIALS SHOWN TO BE PER COMMUNITY SPEC'S. TRIM SIZED PER PLAN.

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



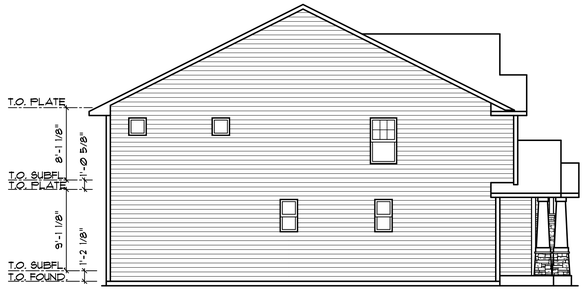
1 / A1 FRONT ELEVATION
SCALE: 1/4" = 1'-Ø"



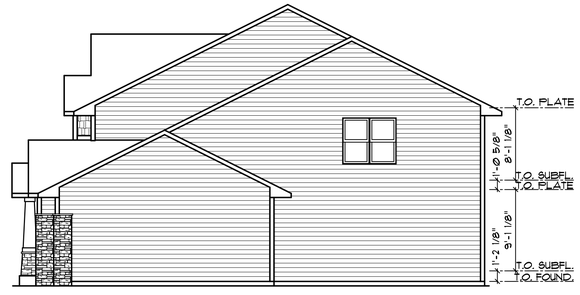
2 / A1 ROOF PLAN
SCALE: 1/8" = 1'-Ø"

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 VALLEY'S.



3 / A1 SIDE ELEVATION
SCALE: 1/8" = 1'-Ø"



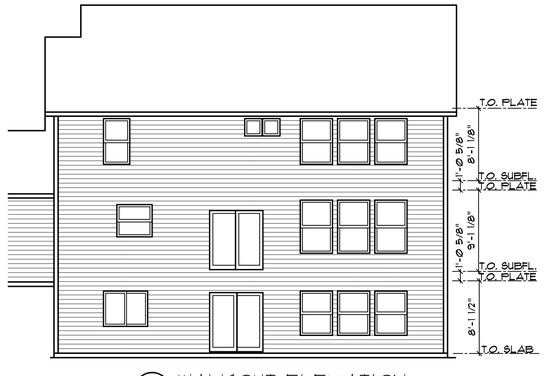
4 / A1 SIDE ELEVATION
SCALE: 1/8" = 1'-Ø"



5 / A1 REAR ELEVATION
SCALE: 1/8" = 1'-Ø"



5A / A1 LOOKOUT ELEVATION
SCALE: 1/8" = 1'-Ø"



5B / A1 WALKOUT ELEVATION
SCALE: 1/8" = 1'-Ø"

DATE: SEPTEMBER 2019
DRAWN BY:
REVISED: 05-01-2021
REVISED:
REVISED:

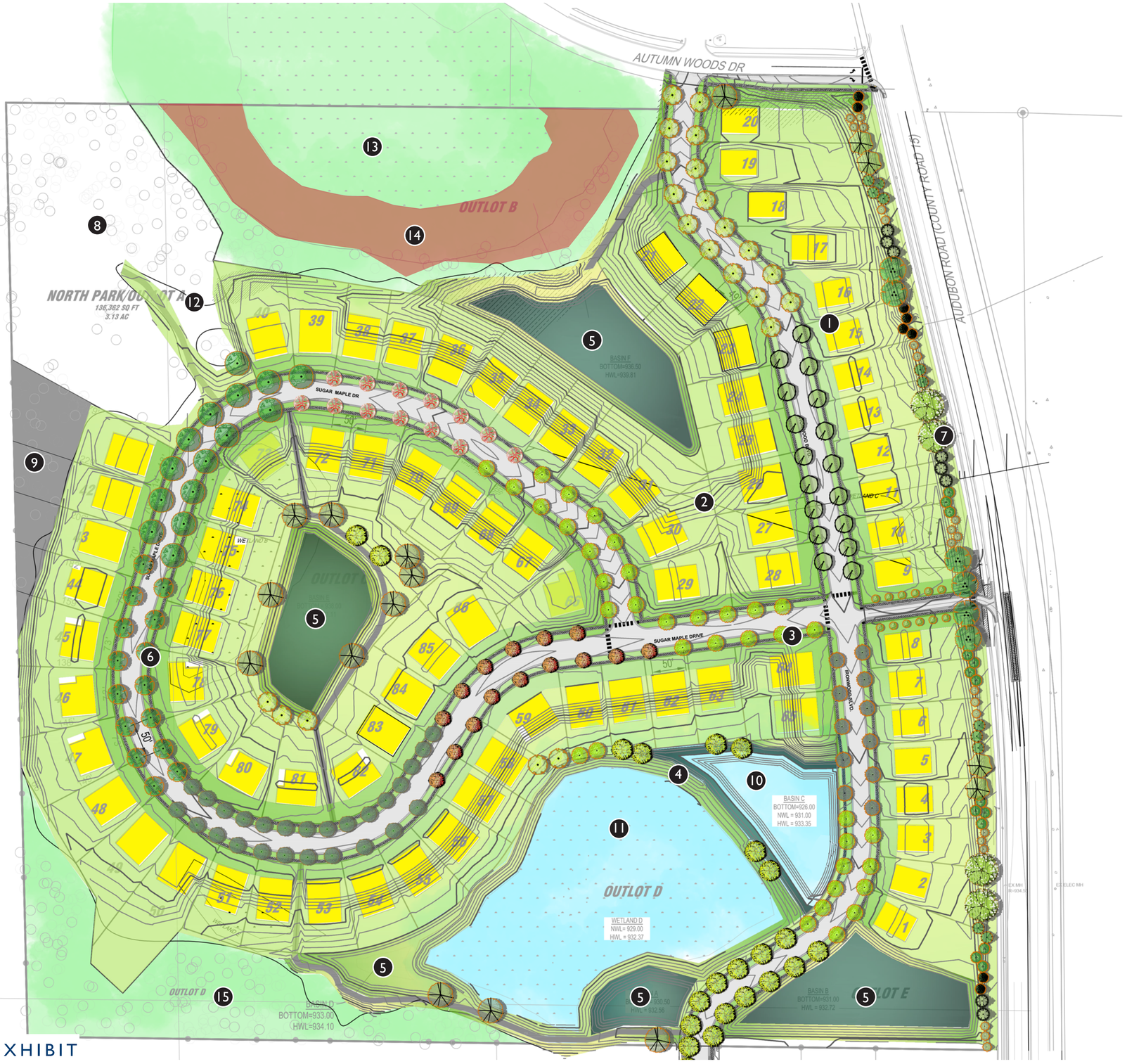
UNAUTHORIZED USE OF THIS PLAN IS A VIOLATION OF THE U.S. COPYRIGHT ACT, TITLE 17, OF THE U.S. CODE.

LENNAR

OWNER:
PROJECT ADDRESS: EHØ5 C4 - WASHBURN
DEVELOPMENT:

LOT NO.
BLOCK NO.
ADDITION NO.

PN:
TITLE: ELEV
SHEET: A1



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

LEGEND

1. PROPOSED HOUSING DEVELOPMENT
2. FUTURE PARK (3.13 ACRES)
3. EXISTING WETLANDS

DAVID MICHAEL ROPER 300610030
MIKEL P JONES 300610020
JEFFREY B & KRISTINE Z CAUSTON 300610010
TERRY J HIESERICH 300610100
TERRY J HIESERICH 300610151
WALTER H JR & KATHLEEN ROTHE 300610110
RICHARD R & SANDRA J ROSSOL 300610120
MARK D & LAURIE A HASSENSTAB 300610140
CHASKA CITY 300610230
WILLIAM J FLEURANT 300610150
MATHEW C POPPLER 300610160
DANIEL E LEE 300610170
WALTER LIVING TRUST 300610180
THE JONATHAN ASSOCIATION 300600060
ANNETTE ORESICK 300600170
DOUGLAS S & MELISSA M JOHNSON 300600180
HANIE J KUKER 300600150
CHASKA CITY 300610210
CHASKA CITY 300600370
JULIAN DRIVE
AUTUMN WOODS DR
SUGAR MAPLE DR
OUTLOT B
NORTH PARK/OUTL
136,362 SQ FT
3.13 AC
40
39
38
37
36
35
34
50'

FEET
0 25 50 100 150

OVERALL CONCEPT EXHIBIT

ISG
Architecture + Engineering + Environmental + Planning

LENNAR RESERVE AT AUTUMN WOOD
CHASKA, MN • 10-08 -2021
ISG PROJECT NO. 21-24984

ISGInc.com

- MINUTES -
CHASKA CITY COUNCIL
September 13, 2021

1. Call to Order
The meeting was called to order by Mayor in Pro Tem Hatfield at 7:00 pm.

2.Pledge of Allegiance

3. Roll Call
Roll call was taken. Present: Councilmembers Hubbard, Huang, Grau, and Mayor in Pro Tem Hatfield

Absent: Mayor Windschitl

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; Luke Melchert, City Attorney; and City Engineer Matt Clark.

4. Adopt the Agenda
Motion by Councilmember Hubbard, second by Councilmember Grau to adopt the agenda as presented. Motion carried.

5. Visitor Presentation

5.A. Chief Seibert & Julie Janke recognizing Mark Jones 10 years of service
Chief Seibert addressed the Council and stated they want to thank Mr. Jones for his exceptional service the past 10 years with CERT. Ms. Janke echoed Chief Seibert's sentiments and thanked him for all his outstanding work. Mr. Jones was presented with a plaque to commemorate his service.

6. Minutes
Motion by Councilmember Hubbard, second by Councilmember Huang to approve the minutes of the August 16th, 2021 City Council meeting. Motion carried.

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

A. Accept Resignation of Eder Castillo from the Human Rights Commission
   Motion to accept the resignation of Eder Castillo from the Chaska Human Rights Commission and open the seat to applications.
B. On-Sale Liquor at Community Event - Schram Haus Brewery

Motion to approve On-Sale Intoxicating License at a Community Event OSCF2021-02 for Schram Haus Brewery, 3700 Chaska Blvd, Chaska MN for the Fire & Ice Festival, effective October 15th & 16th.

C. On-Sale Liquor at Community Event - Crooked Pint Ale House
   Motion to approve On-Sale Intoxicating License at a Community Event OSCF2021-03 for Crooked Pint Ale House, 3210 Chaska Blvd, Chaska MN for the Fire & Ice Festival, effective October 15th & 16th.
D. Adopt Ordinance 998, Amend Chapter 5, Article 5.04 Section 5.04.020 and Article 5.36, Section 5.36.050
   Motion to Adopt Ordinance #998, approving the amendments to Chaska City Ordinance, Chapter 5, Article 5.04, Section 5.04.020 Permit Required Fees and Article 5.36, Section 5.36.050 Licenses.
E. Adopt Resolution 2021-57, Approving the Final Plat Amendment for Harvest West 3rd/Tradition Development/PC #2021-09
   Motion to adopt Resolution No. 2021-57 approving the Final Plat Amendment of the 92-lot development to include approximately 3.2 acres of dedicated ROW for the future extension of Savanna Way in the SW Chaska Growth Area (PC #2021-09).
F. Adopt Resolution 2021-56, Amending Resolution 2021-50 Authorizing Staff to Send Offer Letters to Affected Property Owners
   Motion to adopt Resolution No. 2021-56 amending Resolution No. 2021-50 to include Parcel 21 and Parcel 23.

Motion carried.

8. Action Items

8.A. Adopt Resolution 2021-55, World Learner School Refunding of Series 2011A

City Administrator Podhradsky introduced the item and provided background to the Council. He stated Noel Graczyk, Finance Director, Nate Canova, Bond Counsel to the City, and Deana Siekman, Representative for the school, are present to answer any questions that may come up.

Finance Director Graczyk addressed the Council and reviewed the steps involved in the process of refunding the World Learner School for the 2021 series.

Bond Counsel Canova, addressed the Council and stated provided an overview of the proposed refunding.

Mayor in Pro Tem Hatfield opened the public hearing at 7:20pm.

Bond Counsel Canova, addressed the Council and stated provided an overview of the proposed refunding.

Mayor in Pro Tem Hatfield closed the public Hearing at 7:21pm.

Motion by Councilmember Huang, second by Councilmember Grau to adopt Resolution No. 2021-55 giving host approval and consenting to the issuance of education facilities revenue

notes under Minnesota Statutes, Section 469.152 through 469.165 (World Lerner School Project). Motion carried.

9. Bills
9.A. Accounts Payable Council Roster 9-13-2021

The Council requested further information about bills on pages 5, 22 and 23.

City Administrator Podhradsky provided further information regarding those bills.

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

10. Other Business
10.A. City Administrator's Report
10.A.i. Bi-Weekly Report September 13, 2021
10.B. Other Reports
10.B.i. Financial Reports – July 31, 2021

Councilmember Hubbard:
- Stated she is happy to say the Steiner Kelting facility did open on September 8th
- Noted the amateur baseball tournament was great and congratulated the teams
- Noted Food Distribution event at Gedney Factory is on September 16th 12:00pm – 1:30pm

Councilmember Huang:
- Stated the Taste of Chaska and Farmer's Market were both great and well attended
- Welcomed all kids and staff back to school
- Congratulated the Chaska Hawks Football team on their win
- Noted Christmas in May this weekend
- Stated September 25th is the Fall Festival and Octoberfest in City Square Park
- Stated the Fire and Ice Celebration is on September 16th and 17th and congratulated the Fire Department for 150 years in service

Councilmember Grau:
- Reminder with school starting to be mindful of crosswalks, stop signs and people walking
- Stated the baseball tournaments were great, thanked the volunteers who helped and noted the fans support was amazing
- Recognized the anniversary of 9/11 and its importance

Mayor in Pro Tem Hatfield:
- Thanked the Fire Department for the display they put on for the 9/11 memorial
- Noted Octoberfest and Guardian Angels event is on September 25th

11. Adjourn

Motion by Councilmember Huang, second by Councilmember Grau to adjourn the meeting at 7:40 pm.
Motion carried.

- MINUTES -
CHASKA CITY COUNCIL
September 20, 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, Grau, and Mayor Windschitl

Absent: None

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; Luke Melchert, 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. Minutes

5.A. Approve September 13th 2021 City Council Meeting Minutes

Motion by Councilmember Grau, second by Councilmember Hatfield to approve the minutes of the September 13th, 2021 City Council meeting. Motion carried.

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

A. Adopt Resolution 2021-58, Awarding bid for 2021 Oak Street Storm Water Pump Station Modifications
   Motion to approve Resolution 2021-58 awarding the bid for the 2021 Oak Street Storm Water Pump Station Modifications to Kilmer Electric Co., Inc. in the low bid amount of $574,942.00.
B. Adopt Resolution 2021-59, Resolution Identifying the Need for Livable Communities Demonstration Account Funding and Authorizing Application for Grant Funds
   Motion to approve Resolution 2021-59 identifying the need for Livable Communities Demonstration Account funding and authorizing application for grant funds.

C. Establish a Public Hearing to Consider Approval of the Proposed 2022 Operating Plan and Budget and Imposition of Service Charges for the Chaska Downtown Special Services District

Motion to set the public hearing for October 18, 2021, to review and approve the proposed SSD 2022 operating plan, budget, and service charges and direct staff to give notice of the public hearing.

D. Adopt Resolution 2021-62, Adopt Resolution for City Square West - Support for State Funding

Motion to Adopt Motion to adopt Resolution 2021-62, supporting and authorizing the Mayor and City Staff to apply for State Funds to financially assist with the City Square West Project in Historic Downtown Chaska.

E. Approval of the South West Transit Facility Use Permit

Motion to Approve the South West Transit Facility Use Permit for Parks and Recreation Programming.

F. Adopt Ordinance MC 2021-D1 and Ordinance 1000- Electric Rates and Right Of Way Fee

Motion to adopt Ordinance No. 2021- MC 2021-D1 establishing revised 2021 Electric Utility Rates.

Motion to adopt Ordinance No. 1000 imposing an electric energy right of way fee on customer utilizing the City of Chaska, Minnesota's electric energy service within the City of Chaska.

Motion carried.

7. Action Items

7.A. Adopt Resolution 2021-60, Public Hearing to Consider Certification of Fall 2021 Delinquent Utilities and Miscellaneous Unpaid Fees

City Administrator Podhradsky introduced the item and provided background to the Council.

Mayor Windschitl opened the public hearing at 7:11pm.

None one wished to speak on this item.

Mayor Windschitl closed the public Hearing at 7:12pm.

Motion by Councilmember Hubbard, second by Councilmember Huang to approve Resolution 2021-60 approving certification of delinquent utilities and miscellaneous unpaid charges to Carver County for collection with the payable 2022 property taxes.
Motion carried.

7.B. Adopt Resolution 2021-61, Establish Preliminary City Tax Levy for Taxes Payable 2022

City Administrator Podhradsky provided a presentation on the 2022 General Fund and reviewed the items relating to the tax levy for taxes payable in 2022. and introduced the item and provided background to the Council. He provided a presentation on the 2022 General Fund.

Mayor Windschitl noted the City Council has been through this process many times and wants to ensure everyone is aware this is not something they are taking lightly, he stated they can adjust it in the future as they see fit.

Motion by Councilmember Huang, second by Councilmember Hubbard to adopt Resolution No. 2021- 61 adopting the proposed assessed 2021 payable 2022 maximum property tax levy. Motion carried.

8. Bills
8.A. Accounts Payable Council Roster 9-20-2021

City Administrator Podhradsky provided further information regarding those bills.

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

9. Other Business
9.A. City Administrator's Report
9.A.i. Bi-Weekly Report September 20, 2021
9.B. Other Meeting Minutes
9.B.i. HRC Minutes – July 22, 2021

Councilmember Hubbard:
- Stated Christmas in May was fabulous
- Noted there is a Bicycle Steering Committee meeting on September 21, 2021
- Stated Crucial Conversations will be hosting a picnic engagement event on October 20th at 6:30pm

Councilmember Huang:
- Stated he sends his condolences to Toby Saxon's family, the Electric Director for the City
- Stated Christmas in May was great and noted they were able to help 3 families this year
- Noted the Fall Festival is at 11am on September 25th
- Noted Fire and Ice Festival is on October 15th – 16th

Councilmember Hatfield:
- Stated the Steamboats parade was nice and thanked the Fire Fighters who participated in that event
- Noted it is nice to have some of the roads repaved

Councilmember Grau:
- Noted early voting is open for the School Board Referendum
- Stated the Eastern Caver County Recreation Advisory Board is hiring a new Director

City Administrator Podhradsky:

- Stated it was the 25th year of Christmas in May and thanked everyone who helped
- Recognized Toby Saxon, Electric Director noted he looked up to him a lot, he had a lot of character and thanked him and his family for all the dedication and help over the years stating he will be missed

Mayor Windschitl:

- Stated Toby Saxon was a great person and hard worker who stepped up and became the Director as a Lineman and noted he offers his condolences to his family; stated the wake is at McNearney Funeral Home on Wednesday in Shakopee and the Funeral is at St. Johns in Chaska on Thursday at 1pm
- Stated two Chaska fire fighters, Kyle Smith and Zack Bonnema deployed to Baton Rouge, LA to help with the hurricane efforts and thanked them for their efforts
- Noted the next Council meetings are on October 4th and 18th (to be held at the event center)

10. Proclamation
10.A. In Recognition of Luke Melchert – Chaska City Attorney of 53 years

Mayor Windschitl read a proclamation declaring September 20, 2021, as "Luke Melchert" Day in Chaska, honoring the 53 years Mr. Melchert served as the City Attorney.

The City Council, along with Mr. Melchert's family, Mayor Roepke, State Rep. Boe, Mac Willemssen, friends and colleagues expressed their appreciation for his service and leadership to the City of Chaska and wished him much success and happiness in his retirement.

11. Adjourn
Motion by Councilmember Hatfield, second by Councilmember Grau to adjourn the meeting at 8:48 pm.
Motion carried.

- MINUTES -
CHASKA ECONOMIC DEVELOPMENT AUTHORITY
SEPTEMBER 13, 2021

1. Call to Order
President Pro Tem Hatfield called the meeting to order at 7:42 pm.

2. Roll Call
Roll call was taken. Present: Commissioners Hubbard, Grau, Huang, and President Pro Tem Hatfield.
Absent: President Windschitl

Also Present: Nate Kabat, Assistant Executive Director and Matt Podhradsky, Executive Director.

3. Agenda
Motion by Commissioner Hubbard, second by Commissioner Grau to adopt the agenda as presented.
Motion carried.

4. Minutes
Motion by Commissioner Hubbard, second by Commissioner Huang to approve the July 19, 2021 EDA Meeting Minutes as presented.
Motion carried.

5. Letter of Intent with Lariat Companies, Inc., for 3.72 acres of land at Chaska Boulevard and Fire Lane – Former Building Center Site

Assistant Executive Director Kabat presented this item to the Commission and provided some background.

Commissioner Hubbard asked if the businesses that move into the industrial slots will fall under the Downtown Business Alliance. Executive Director Podhradsky stated no and noted where the area is that a business would need to be in order to be part of the Downtown Business Alliance.

Motion by Commissioner Huang, second by Commissioner Hubbard to authorize the EDA President Pro Tem Hatfield to sign the Letter of Intent with Lariat Companies, Inc. for 3.72 acres of land at the former Chaska Building Center site at Chaska Boulevard and Fire Lane.
Motion carried.

6. Other Business
There was no other business.

7. Adjourn
Motion by Commissioner Grau, second by Commissioner Hubbard to adjourn the meeting at 7:53pm.
Motion carried.

- MINUTES -
CHASKA ECONOMIC DEVELOPMENT AUTHORITY
SEPTEMBER 20, 2021

1. Call to Order
President Pro Tem Hatfield called the meeting to order at 8:49 pm.

2. Roll Call
Roll call was taken. Present: Commissioners Hatfield, Hubbard, Grau, Huang, and President Windschitl.

Absent: None.

Also Present: Nate Kabat, Assistant Executive Director and Matt Podhradsky, Executive Director.

3. Agenda
Motion by Commissioner Hatfield, second by Commissioner Grau to adopt the agenda as presented.
Motion carried.

4. Minutes
Motion by Commissioner Hatfield, second by President Windschitl to approve the September 13, 2021 EDA Meeting Minutes as presented.
Motion carried.

5. Adopt Resolution 2021-23, Adopt Resolution Establishing a Preliminary Chaska EDA Maximum Tax Levy for Payable 2022

Executive Director Podhradsky presented this item to the Commission and provided some background.

Motion by Commissioner Hubbard, second by Commissioner Huang to Motion to adopt EDA Resolution 2021-23 establishing a preliminary maximum property tax levy for payable 2022.
Motion carried.

6. Other Business
There was no other business.

7. Adjourn
Motion by Commissioner Hubbard, second by Commissioner Hatfield to adjourn the meeting at 8:58pm.
Motion carried.

Chaska Park Board
Meeting Minutes
September 14th, 2021
Council Chambers and via Zoom

1. Call to Order

The September 14th meeting of the Chaska Park Board was called to order by Chair David Downs at 7 pm in the Council Chambers.

2. Roll Call

David Downs, Jason Branch, Elizabeth Wynveen, Georgiann Keyport, Donelle Heieie, Karli Cich, Thomas Massey.

Absent: Zach Saueressig, Jalen Destin

Staff Present: Marshall Grange, Mary Monteith

3. Adopt Agenda

Motion by Keyport, second by Wynveen to adopt the agenda of the September 14th meeting.

Motion Carried.

4. Visitor Presentation

None

5. Approve Previous Park Board Meeting Minutes from August 10th, 2021

Motion by Massey, second by Heieie

Motion Carried.

6. Receive Council and Planning Meeting Minutes

6A. Council Minutes July 19th

6B. Council Minutes August 2nd

6C. Planning Minutes July 14th

7. Action Items

7A. Recommendation to City Council to Approve the SouthWest Transit Facility Use Agreement

Grange explained the action item spoke of at last month's meeting. A unique opportunity at hand to work with SW Transit on programming their underutilized space on the upper level of their parking ramp here in Chaska. Covid has been hard on the transit industry, with many people still working from home. Staff have met with Len Simich from SouthWest Transit, the opportunity came to us to look at a Facility Use Agreement, it is pretty straight forward. In exchange for the Cities use of that space, they have asked for a hold harmless indemnification on any claims that may occur, as well as adding them as an additional insured on the City's insurance policy.

With recommendation for approval to the City Council next week, we then will look at starting out with pickleball as an option on the upper level. Staff have been planning in prep of the approval, the hope would be to try to get some temporary courts in yet this fall to see what the response is and then plan for next spring, summer, and fall as to what other programming options there may be in coordination with Simich.

Downs, he's reviewed the contract, nicely done. He asked if this would go to council next week for final approval? Grange, yes, then we would set up the nets, paint the courts, and build off that. Concerns on the wind factor up there, so will be a bit of a trial and error in the beginning. Discussions on security, water pooling and a suggestion for using the ramp for a "trunk and treat" event.

Massey motion to recommend to City Council approval of the SouthWest Transit Facility Use Agreement, second by Branch.

Motion Carried.

8. Discussion Items

8A. Update on Naming Rights and Sponsorship Proposals

Grange, this has been an ongoing item from last spring. If you recall, we had a work session with you and the council to talk through the idea of sponsorship and naming rights on some of our facilities.

We moved forward in July with an RFP that led to reviewing proposals from two consulting firms in August, Front Burner Sports and Entertainment, a local firm and Superlative Group, a firm out of Cleveland, Ohio. If you recall at our last park board meeting, we talked about conducting interviews and appointing a couple park board members as part of that process. Resulting in Dave Downs and Zach Saueressig being a part of the interviews. We met and reviewed the proposals and put together our game plan, along with questions. We then had the interviews on Sept. 7th. We met with Chris Potenza, President of Front Burner Sports and Kyle Canter, Chief Operating Officer from Superlative.

Both interviews went very well, we learned a lot, and had great discussion. We reconvened last week to debrief and determined we need to take some additional time to look into things, references as well as ask some follow up questions of the consultants. There was so much information and content, we want to take our time and do this right. Then our plan would be to bring back our recommendation to you at the October park board meeting.

Downs, thought they were very interesting interviews. Some good discussion, some similarities, some differences. Nice to have two opportunities in front of us. It is going to take a bit of work to determine which one to recommend. Both are very capable; it will be which one can do the best for our community.

8B. Update on Pedestrian and Bicycle Master Plan

Wynveen updated the board on the last steering committee meeting held Aug. 17th, Antonio has been working on putting forth the recommendations for the city plan. At the same time, the steering committee has been working on evaluations of what the city already has in place for infrastructure and has facilitated on-going conversation surrounding the 6 E's.

Antonio has shared his report will come outlined with priority, along with price tag. Wynveen, all of us can appreciate that if there is a recommendation surrounding infrastructure, which can be quite costly, that Antonio also has focused on programming options as well, as often times you can do as much with programming at a lot less cost as one does with infrastructure. Example, a crossing guard vs. reconfiguring an intersection. The hope is we focus on programming for the city which will help keep down the costs, but it will probably be more of a marrying of the two, with what the city already has in place and what the survey feedback from residents is, some of which is that the city may be lacking.

We also are in the process of lining up 3 listening sessions. We are looking to have one with the Chaska Mountain bike team, a Latino group at Riverview mobile home park, and one with a group from the Carver County CDA.

Wynveen, at the last steering committee meeting, Antonio mentioned that people at River City days were very engaged, we received a high level of thought from the community. The amount of public comments we received is way more than even other larger communities have gotten. People were also very interested in learning more about the maps and wanting one. Grange, it is a testament to Chaska residents; they want to be involved with this plan. Wynveen, be proud of what we are doing here, we are spending the resources to make it better for everyone in the community. Grange also reiterated that.

Behind the scenes, Antione is working to put the overall draft and chapters together, it should be complete in a couple weeks. It then will be available to review via: walkbikechaska.org. We will promote that, as well as the community opportunity to review the draft. Staff also are planning multiple open houses. City staff will also be reviewing the draft at that time as well.

Grange met recently with Pat Stieg, from Carver County Public Health, Stieg was key in getting the SHIP dollars for this plan. We met to discuss the timeframe of spending these dollars as well as in anticipation of some of the recommendations that may come from the plan, and what those costs will look like. Some general thoughts, as for evaluation, helping to fund digital trail counters to see how many use the trails, as well as map funding, (a frequent request) and funds for grant writers for some of the other more costly recommendations that may be identified. We have a great partnership with Pat and Carver County, they are commitment to this plan as well.

Downs, will the draft have recommendations/priorities to it right away? Or will that be talked about in some of those sessions? Grange, there will be a start to those conversation but will be a couple more months before those recommendations are complete.

Branch, the ratings for the Bike Friendly Community designation, what is the ranking system for that? Grange explained it is bronze, silver, gold, and platinum. He asked if we would have a decent chance of getting the designation because of this plan? Grange, once we go through this plan and evaluations are made, we would know what else we need to do to secure the designation. Grange, by having a master plan in place, it helps secure a level of bike friendly. Keyport asked about maps and making them more available, Grange shared that would be part of the next steps, the SHIP funding could help with that cost.

C. Department Happenings

Grange shared upcoming events in the community:

This Thursday is another food distribution event at Gedney, they are still looking for volunteers to help, Chaska Cares will be there as well.

This Saturday is our first official parkrun event. This was an item from a couple years ago, where we partnered with Eagan to move this forward here in Chaska. It is a completely volunteer run event, it takes time to find people to step up. A race director was secured, (Trevor Luyt) along with necessary volunteers to run the program. Our trailhead is at the corner of Beech and East Second St., by the Carver County Government building. This is a free, timed, out/back walk/run. They keep stats on how many runs a person has done, the times, etc. People can participate to the level they want and gather socially after. Registration is at: parkrun.us. A great thing for our community.

This Saturday is Christmas in May, in September! A great opportunity to help others. Volunteers help with painting, landscaping, decks, etc. Show up at GA gym at 7am for registration, a continental breakfast, and a kick-off program. Volunteers can choose from 3 houses to help at this year.

Plans for Fire/Ice are still happening in preparation of the event coming up on Oct. 15th-16th. Typically, this is in July, we pushed it back to fall for better timing of things with Covid. A lot of planning by the staff. This year we also will be celebrating the 150th anniversary of the Chaska Fire department. The Bonspiel will be starting Thursday evening; the rest of the events start Friday at 6pm. This a great family friendly event in the park, there will be games for kids, face

painting, a bean bag tournament, fire department water fights, food trucks, beer, and lots of great bands! FUN for all!

Capital improvements projects:

Clover Ridge outdoor hockey rink boards are down, the install of the new ones is thought to be the end of October.

Public Works staff are spending a lot of time at the Chaska Loop site putting in the trails and paving the cart paths.

The start of the demolishing of the Cortina Woods playground equipment is set to happen soon, then install to occur towards mid-October.

Grange shared a thank you to the many involved with hosting the State Amateur baseball tournament at Athletic Park. Congratulations on the success of event.

9. Other Business

9A. Round Table

Cich-fall is a great time to get outdoors, I'm noticing a lot of buckthorn along the trails, take note of it, maybe we can get rid of some day. Resources are out there to learn more, at EDD Maps. It traces where people find it. Keyport, the U of M has good information out there as well. Start with education, pull a subgroup together to get the information out there and attempt a community project. Public Works is tracking where most of it is. Grange, could be a great community initiative to start up and help manage it.

Heieie-Oak Ridge Conference Center land has been sold. Highway 41 improvements are in discussion, now would be the time to talk sidewalks/trails. We want to be involved with how the land and trails around Costco is developed.

Keyport-questions on the Del Web development, she toured some models. She asked about parks there, as well as access in off 41 and out via the neighborhood. Residents will have their own clubhouse there, with a pool. There is a park in the adjacent neighborhood, so no need for another on. She shared she will be helping at Christmas in May next week, lots of landscaping to be done. She was at the state fair recently and noticed information on green step cities. Carver County, and the cities of Shakopee and Carver have the designation. A program to assist cities with building sustainability and life goals for the city. She asked if the city ever looked into that. Cich, also saw that at the fair, an interesting opportunity for Chaska. Grange commented that it is similar to the Bike Friendly initiative, we will look for more information, seems like it would require involvement from other city departments as well as discussions with the city administrator. Bares again, the conversation of what are our priorities looking ahead, what are our goals. Will look to the end of the year to discuss more at a work session.

Wynveen-Shared an upcoming park and rec opportunity, informational sessions to discuss ideas for after school programming for teens. Staff are looking for ideas and feedback from the community. These will be held Monday the 20th, and Thurs. the 23rd, 6-7pm, at the Lodge.

Grange, with proximity to the 2 middle schools, it seems like a good fit. How do we become more accommodating to the kids in those schools? They need their own space. We could possibly host events in the Lodge. The Lodge programming typically is done in the morning till 3pm. We want to get from parent's ideas on what that could look like. Maybe we can even get them interested and involved with volunteering opportunities and being a part of something more in the community.

Massey-I want to apologize for volunteering for the RFP interviews recently. I could not be a part of them at that time, as I was interviewing myself for a promotion and got the position. As part of that, it is taking me to North Carolina. So next month will be my last time meeting here. Congratulations from all.

10. Adjourn Meeting

Motion by Wynveen to adjourn the meeting, second by Heieie.

Motion Carried.

Chaska Park Board
Meeting Minutes
August 10, 2021
Council Chambers and Via Zoom

1. Call to Order

The August 10th meeting of the Chaska Park Board was called to order by Chair David Downs at 7 pm in the Council Chambers.

2. Roll Call

David Downs, Jason Branch, Elizabeth Wynveen, Georgiann Keyport, Zach Saueressig, Donelle Heieie, Karli Cich, Thomas Massey, Jalen Destin.

Staff: Marshall Grange, Mary Monteith, Kevin Wright, Communications Manager

3. Adopt Agenda

Motion by Keyport, second by Heieie to approve the August 10th meeting Agenda.

Motion Carried

4. Visitor Presentation

None Present

5. Approve Previous Park Board Meeting Minutes from July 13th, 2021

Motion by Heieie, second by Wynveen.

Motion Carried

6. Receive Council and Planning Meeting Minutes

6A. Council Minutes June 21st

Wynveen noticed there was discussion at the June 21st meeting on vandalism done at Firemen's Park and City Square, she asked if that has been cleaned up or fixed. Grange explained the situation at Firemen's Park, we are working with the contractor to get it fixed. The police were involved and determined it was youth that threw a rock at the monument, breaking it. Parents were notified and will work on cost of the damage. We are not aware of damage done at City Square, we will need to look into that and report back.

We are partnering with the police department to have a presence in the park over the summer. They have implemented a bike patrol program this summer where officers are riding throughout town on bikes, so hoping with a more visible presence, this will help to minimize some of the of the things happening in and around Firemen's Park.

6B. Council Minutes July 12th

6C. Planning Minutes June 9th

7. New Business

7A. Partnership with SouthWest Transit

Grange shared that we have another partnership opportunity to consider. It stemmed from a conversation with Council member Huang in talking with Len Simich, from SouthWest Transit. Essentially it would be exploring the idea of using their upper-level parking ramp here in Chaska for recreation use. Grange thought it was an intriguing idea, so set up a meeting with Len. It sounds like the impact of Covid has been hard on the transportation industry with more and more working from home. The upper-level space has been vacant for a while. It offers a nice benefit for us with some programming, and a unique experience to our community. The benefit for SouthWest Transit would be making use of their facility during a time like this and providing awareness and marketing of their facility. Really just being good partners.

So initially we are thinking of offering pickleball. When you come up to the upper level, this would be the westerly end of the ramp. Pickleball being a growing sport, many mornings people are waiting to get on the courts. We already have portable nets to put up there, there is lighting and the

convenience of parking. There also are restrooms available during the day, will need to talk more on after hours.

Where it stands right now, we have a draft agreement for review. I wanted to put this before you for feedback, questions, or concerns, and then ultimately, we would bring it back in September for approval. Questions were answered by Grange on balls going over the top of the ramp, access to the location, and security/lighting. Downs stated If we have people waiting on pickleball courts, this is a good option. Grange, there really isn't any obstacle to this. Consensus was "sounds" cool. Branch asked about space for other things up there, like roller blading. Grange said initially the contract will address pickleball. We will see how things go, and continually evaluate.

8. Discussion Items

8A. Update on Naming Rights and Sponsorship Request For Proposals

Building off our meeting last month, the RFP was sent out to 6 firms July 12th. The deadline was July 30th. We received 3 proposals back from the following, Great Plains Sponsorship, Front Burner Sports, and the Superlative group. Grange followed up with each to let them know we received their proposal and to make them aware of next steps. At that time, he got a response back from Great Plains Sponsorship, that they were no longer interested in the process, and they removed their proposal from consideration. So, there are now two proposals to consider. My recommendation is to conduct interviews with the two firms, and my thought in the process is to include two park board members to participate in those interviews with me. They can help represent the board and help determine which consulting firm to bring back for recommendation. My goal would be to try and line up these interviews in the next 2/3 weeks and come back to the September park board meeting with a recommendation based on consent of the interview group, to the park board and then on to council for final approval.

Downs talked with board and asked who would be interested in participating in the interviews. This is a good way for us to be a part of the process, Downs is personally interested as is Branch. Downs asked If any of you would have the talent to be a part of this, I'll open it up for discussion. Keyport asked what kind of experience would be helpful. Downs talk about his business and sales background, felt that is the kind of experience needed for this. Business, finance, marketing. Massey expressed interest, asked about when the interviews would be held, Grange thought more than likely during business hours. Downs, yes, agree, not open to offering Zoom, this is too important, they would need to be here in person. Downs also talked about importance of meeting prior and spending time talking on the process as well as questions to be asked. What do we want to get out of this? We will need justification on who we are

recommending and will need to help Marshall prepare the decision to bring back to the park board and council. Massey is interested, he has a finance background and could make the interview times work with advanced notice. Branch declined based on Massey's experience. Downs and Massey will do the interviews with Grange. Grange will send out the consultant proposals for them for review and look at calendar dates to meet.

By the next board meeting, we will have had the interviews and will bring back recommendations to the board and talk more about it.

8B. Update on Pedestrian and Bicycle Master Plan

Commissioner Wynveen gave an update on happenings since the last meeting.

We had a steering committee meeting a couple weeks ago. We talked about the success of the pop-up event at River City Days. Around 200 people stopped by the booth and gave further comments and ideas on walking and biking. The Steering committee is still going over all comments. We are planning 3 listening session in the community for youth in the area, as well as underserved populations.

The committee is also working to assess the current programming we have around the city specific to walking and biking. Such as biking rules, choosing to bike on the road vs. a path etc. Quite a bit of work still ahead but making progress.

Grange, yes in the middle of this plan, a lot of work going into this. The input others are providing as part of the process is great. I connected this week with Pat Steig from Carver County Health, as he ultimately supported our SHIP grant for this project. The grant cycle is October 2020-October 2021. The projects approved need to be completed at that time. Antonio as the consultant agreed to that, and it was clearly defined in the RFP. I think we can meet that target, but just wanted on his behalf to reach out to Steig and see if generally there is any flexibility on extending that final report date. Steig was agreeable to that and agreed to setting it for the end of the year. Those couple of months will be really beneficial for Antonio to complete a quality final document for us. Grange explained part of the reason he wanted to do this is because we've gotten so much community engagement, which is great, however, it also means more work for the consultant to factor that all in. So, we are needing a bit more time to have those listening sessions as well as account for all the feedback we've gotten.

Branch asked how that impacts the contract, and fees. It still falls within the same contract. He could meet the deadline, with have had the opportunity for more data, it was my idea to ask for the extra time.

Downs asked if once the plan is done, is Antonio responsible to help us implement the plan or is his role done? It really will be on us to move this forward, using the community feedback and Antonio's recommendations for us to look at the implementation of things.

8C. Department Happenings

Grange shared some things coming up in our department:

The new recreation activity guide is out! We moved to bring this inhouse, this is the first one. Excited how it has turned out, thanks to Krista and Jaime, they did a great job and using this new platform called LucidPress. We also have moved to an on-line only format, no longer mailing out. We do have some printed versions at the front desk of the community center. We'll continue to see if we get feedback.

Public Works is seeking bids on replacing the hockey boards at Clover Ridge. They also are spending a lot of time over at Athletic Park gearing up for the State Amateur Baseball tournament. It is the 98th annual tournament. The dates are August 20th-September 6th. Our own Chaska Cubs are in the tournament! Go to WCH2021.com for more information.

Cortina Woods neighborhood park improvement project, the one we worked on earlier in the year, is still in the works, no concrete timeline yet.

Chaska Curing Center hosted the USA Curling junior camp, it brought in about 100 kids from all over.

This week we are hosting the U21 National Championship. Attendees are competing for their chance to complete at the upcoming World Championships. This is a great chance to go check out some great curling.

Staff will be shutting down the beach at Firemen's starting August 31st. There will be modified hours at the concessions stand as well. Staff are heading back to school.

Next Thursday the Chaska Cares team will be back out at the food distribution event again at Gedney.

August 19th is also Touch A Truck! 5-7:30pm, one of the biggest and best events we put on at the Community Center.

The Art Consortium of Carver County Song Writers and Musicians CD Release concert will be August 22nd from 5-8pm at Firemen's Park, along with some art venders as well.

On Aug. 26th, staff are hosting a movie in the park starting at dusk at Firemen's Park, featuring Ria and the Last Dragon.

Back to School Bash, Aug. 29th at City Square Park. From 5-8pm featuring District 112 Garage Bands and a Genesis and Phil Collins tribute band, "And Then There Were Eight".

The Arts Consortium has a new honoring cultures exhibit called "We All Belong". A neat photography display with different themes, resulting from a 6-week workshop series last spring. Features photos from different cultures, come check it out.

Update on the state of the Lennar development, the Wagner property, there still working on their preliminary plan and the traffic analysis. The thought is it could be another 2/3 months before we see another updated plan presented.

Covid-new Delta Variant is causing some concern. Grange shared that our EOC team has reconvened and is meeting weekly again. We are stay on top of things, the community impact, what the recommendations are, etc. Currently those are recommendations to wear masks indoors, not enforcing anything currently.

Grange shared that he is attending a meeting in Crosby, MN Thursday with County Commissioner Matt Udermann, to meet with the individuals responsible for the development of the Cuyuna mountain bike trails. This is an opportunity to learn about how they came up with the idea, what the challenges/obstacles were and the benefits that have come out of it. Several leaders from the area are invited to see what take aways we could learn and apply here.

9. Other Business

9A. Round Table

Destin watched the Minnesota gymnast and the men's basketball team win the gold medals at the Olympics, was pretty cool.

Heieie mentioned the fall activity guide flyer, was super helpful. Shared she read through a lot of the Pedestrian Bicycle Master Plan, was fun to read some of the comments. I learned some new things about Chaska.

Cich shared that the Shakopee Mdewakanton Sioux Community Wacipi is next weekend, featuring local native culture, art, and food trucks. It is very relevant to our history. I'd encourage you to check it out. Free 3-day event.

Keyport commented on the drought, be cognizant of water use right now. Does the city maintain the parks in a different way through this? Grange will check with public works.

Branch, River City days was great. Awesome to see the dance floor packed, and people having a great time.

Wynveen attended the classic car show at City Square last weekend, was neat. The Taste of Chaska is coming up, as is Touch a Truck and the Carver County Fair. Go out and check some things out.

` Saueressig, school starts in 4 weeks, all in person, there is an on-line option and masks are optional. He was over by the Degler farm off Audubon recently, their future development, lots going on over there, curious with what they are doing? Wynveen thought it was mostly commercial, but Grange will look into. He shared he recently had his daughter in swim lessons, was great, the lifeguards were also great. I also used the on-line registration system, was easy. A dream thing I have, an outdoor water park

would be great to have in our community. We recently had so much fun at the St. Louis Park one. Also, a sledding hill, maybe we partner to help Jonathan do more with the one off Bavaria. I am just planting the seed.

Downs, currently the staff is strapped. However, one of the things we have done in the past at the end of each year is look at the priorities that we have. Make a list and every year, ask, what do we want at the top of the list. We should do that again this year.

Massey, watering around Walden Park, it looks like it is getting watered every day. I'm excited about this pickleball opportunity, I just got back from a vacation where I played it. I also recently did the Tour de Tonka, got me thinking, what about a local one.

Downs, I thought the fall activity guide was excellent, well done. Went to River City days, and saw the Minnesota Valley band, was really good. I'd echo earlier, the Cricket Club, it would be good to help market and share information on when they are playing or teaching the game. Grange, I want to make sure the school district is aware of this cricket field as well as they could help introduce it and promote it in the schools.

10. Adjourn

10A. Next Meeting September 14th

Motion by Saueressig, second by Wynveen to adjourn the August 10th Park Board meeting.

.