2C. Public Hearing - Consideration of a request for Preliminary Plat of Meadows at Pioneer Park; Development Stage Planned Unit Development; Rezoning to Planned Unit Development for proposed 157 single-family residential development in the Monticello Orderly Annexation Area (MOAA), currently guided as low-density residential Applicant: Reid Schulz

Prepared by: Grittman Consulting, Stephen Grittman, City Planner	**Meeting Date:** 05/06/2025	**Council Date (pending Commission action):** 05/27/2025
Additional Analysis by: Community Development Director, Community & Economic Development Director, Assistant City Engineer, Chief Building Official		

ALTERNATIVE ACTIONS

Decision 1: Consideration of Request for a Development Stage Planned Unit Development for the Meadows at Pioneer Park, a proposed 157 lot single-family residential development

1. Motion to adopt Resolution No. PC-2025-22 recommending approval of a request for a Development Stage Planned Unit Development for the Meadows at Pioneer Park, a proposed 157 lot single-family residential development, subject to the conditions in Exhibit Z and based on findings in said resolution.
2. Motion to adopt Resolution No. PC-2025-22 recommending denial of a request for a Development Stage Planned Unit Development for the Meadows at Pioneer Park for proposed 157 lot single-family residential development, based on findings to be made by the Planning Commission and directing staff to prepare the resolution and authorizing the Chair to execute said resolution.
3. Motion to continue the hearing to the Planning Commission regular meeting of June 3, 2025 and postpone action on Resolution No. PC-2025-022.

Decision 3: Consideration of an amendment to the Zoning Ordinance adding the "Meadows at Pioneer Park PUD District", and rezoning to Planned Unit Development for Meadows at Pioneer Park, a proposed 157 lot single-family residential development

1. Motion to adopt Resolution No. PC-2025-23 recommending approval of the zoning district amendment adding the Meadows at Pioneer Park PUD District and Rezoning to Planned Unit Development for Meadows at Pioneer Park, a proposed 157 lot single-family

residential development, and rezoning the proposed Lot 1, Block 11 to R-1, subject to the conditions in Exhibit Z and based on findings in said resolution.

2. Motion to adopt Resolution No. PC-2025-23 recommending denial of the zoning district amendment adding the Meadows at Pioneer Park PUD District and Rezoning to Planned Unit Development for Meadows at Pioneer Park, a proposed 157 lot single-family residential development, and rezoning the proposed Lot 1, Block 11 to R-1, based on findings to be made by the Planning Commission and directing staff to prepare the resolution and authorizing the Chair to execute said resolution.
3. Motion to continue the hearing to the Planning Commission regular meeting of June 3, 2025 and postpone action on Resolution No. PC-2025-023.

Decision 3: Consideration of a Request for Preliminary Plat of Meadows at Pioneer Park, a proposed 157 lot single-family residential development

1. Motion to adopt Resolution No. PC-2025-21 recommending approval of the Preliminary Plat of Meadows at Pioneer Park, a 157 lot single-family residential subdivision, subject to the conditions in Exhibit Z and based on findings in said resolution.
2. Motion to adopt Resolution No. PC-2025-021 recommending denial of a request for Preliminary Plat of Meadows at Pioneer Park, a proposed 157 lot single-family residential subdivision, based on findings to be made by the Planning Commission and directing staff to prepare the resolution and authorizing the Chair to execute said resolution.
3. Motion to continue the hearing to the Planning Commission regular meeting of June 3, 2025 and postpone action on Resolution No. PC-2025-21.

REFERENCE AND BACKGROUND

Property:	Legal Description:	Lengthy-Contact City Hall
	PID #:	213100242201, 213100242202
Planning Case Number:	2025-23	
Request(s):	1. Development Stage Planned Unit Development 2. Amendment to the Monticello Zoning Ordinance establishing the Meadows at Pioneer Park PUD District, and Rezoning to Planned Unit Development for proposed 157 unit single-family residential development in the Monticello Orderly Annexation Area (MOAA), currently guided as low-density residential 3. Request for Preliminary Plat of Meadows at Pioneer Park	
Deadline for Decision:	June 14, 2025 (60-day deadline) August 13, 2025 (120-day deadline)	

Land Use Designation: Low Density Residential

Zoning Designation: Monticello Orderly Annexation Area (MOAA)

Overlays/Environmental Regulations Applicable: Wetland Overlay District

Current Site Uses: A single-family residential home and vacant land

Surrounding Land Uses:

North: R-1, Single Family Residential
East: Vacant Agricultural, County Zoning
South: R-1, Single Family Residential/Vacant Agricultural, County Zoning
West: R-1, Single Family Residential

Project Description: The project consists of a plat proposing 157 single family detached residential units on approximately 67.5 acres of land. The current property owner will retain a 4-acre parcel with existing structures as a part of the plat. The remainder of the property is proposed to be developed under a Planned Unit Development that includes reduced lot sizes and flexibility from various other aspects of the City's single family zoning standards including floor area, side yard setbacks, garage size, building materials, and landscaping quantities.

ANALYSIS:

Land Use

The subject site is located within the Monticello Orderly Annexation Area. The property owner has petitioned for annexation to the City. The City Council has acknowledged the receipt of the petition for annexation for purposes of review in compliance with the terms of the OAA agreement and with City land use requirements.

The applicant presented a concept PUD with a similar lot plan to the Planning Commission and Council in September of 2024. The concept materials and minutes are included with this report for reference.

The current Monticello 2040 Vision + Plan land use plan designates the subject property for Low Density Residential (LDR) land uses. The Comprehensive Plan specifies a density range of 3 to 6 units per acre in this land use category. The Plan states:

> *Generally, an average density of 4 housing units per acre characterizes single-family neighborhoods but these areas could likely be developed between 3-6 units per acre depending on utility infrastructure, sensitive natural resources, conservation style development, developer preferences and project specifics. Other types of single-family housing styles, including small-lot development and attached single-family homes is encouraged in this and other residential land use designations.*

The Plan assigns both R-1 and R-A zoning designations to the Low Density Residential land use category. General application of the current R-1 lot standards would result in a plat that is approximately 2.5 units per acre, net of right of way, wetlands and ponds. The 63.5 acres proposed for new development within the plat and PUD results in a gross density of 2.47 units per acre, and 3.33 units per net acre (exclusive of wetlands and storm ponding).

This project is therefore consistent with the Comprehensive Plan's density expectations and allowance for small lot single family units. The applicant proposes the use of PUD zoning to accommodate the lot configurations and to vary from the corresponding base R-1 zoning standards identified in the 2040 Plan. As a reminder, land is zoned at the time of annexation to the City. The application of PUD zoning permits the City and Developer to consider alternative designs that meet the intent of the zoning ordinance and the Comprehensive Plan. For these purposes, the intent of the Plan is to create high quality, sustainable neighborhoods through flexibility to lot size or other elements. However, as with any PUD proposal, the City, through its City Code, requires that flexibility from zoning standards is accompanied by an equal or greater provision of improvements and amenities that can be judged by the City to result in a project that meets or exceeds the City's housing goals, despite variation from specific zoning standards.

In a recent workshop session, members of the Planning Commission and City Council, along with staff, discussed the City's housing status, noting that the 2023 Housing Needs and Demands report illustrated a shortage of buildable single-family parcels. The discussion at the workshop also highlighted a number of comments related to the City's preferences for future single-family development. These comments coalesced around a general expectation that the City's traditional R-1 development patterns are the preferred standard for new development. These would typically include lot sizes of at least 70 feet in width (with an average of 80 feet), and 10,000 square feet in minimum lot area (with an average of 12,000 square feet). The R-1 zoning standards also include a requirement that homes constructed in this district consist of 1,050 square feet of foundation size, and a minimum finishable area of 2,000 square feet.

Discussion also included an acknowledgement that current development trends are seeking a reduction in these formerly common lot sizes. Some of the discussion at the workshop suggested that regardless of the platted lot sizes, the City was particularly interested in the expectation that front-facing living space, front yards, landscaping, and streetscape would be

paramount in considering any departures from the base R-1 requirements. The workshop attendees stressed that they would be relying on neighborhood character as a key element for PUD consideration, including smaller lot sizes.

Additional comment during the workshop concerned the role of housing in supporting the growth and health of the school district, noting that enrollment had remained flat in the Monticello District for an extended period. This discussion highlights the importance of providing variety of housing choices across the life-cycle spectrum. Student enrollment is often dependent on new young family formation – a demographic that is often also at the beginning/lower end of its lifetime earnings. This demographic would require affordable housing options for at least some portion of the new housing stock. The workshop comments also noted the companion need for housing choices that support retaining families as their children age through the educational system, with households moving to larger homes but seeking to maintain enrollment within the district.

Finally, although not highlighted during the housing workshop, the City has extensive resources devoted to attracting new commercial and industrial development. The 2040 Plan includes specific goals for the development of tax base and employment. Population growth and skilled labor supply are two of the key factors in achieving these goals. As such, the City has approached the development market with an emphasis on supporting sustained housing growth that provides workforce housing opportunity as an important support for its economic development interests. This interest in sustained growth is balanced with the City's interest in quality housing and long-term neighborhood viability.

Thus, while the proposed project meets the density expectations of the Comprehensive Plan, the application of PUD should support these goals. The PUD analysis below addresses these considerations.

Preliminary Plat

As discussed above, the proposed plat consists of 157 total new single family detached parcels. Of these, 95 parcels would be designed with a minimum 65 foot lot width, with the remaining 62 parcels designed with 45 foot lot widths. The applicant proposes side yard setbacks throughout the plat at 7.5 feet, a reduction from the 10 foot setbacks otherwise applicable in either R-1 or T-N (Traditional Neighborhood) districts. The 15 feet of total side yard space means that the lots will accommodate either 50 feet or 30 feet building widths, respectively.

The following comments relate to the proposed plat layout. Other site development and building standards are discussed in the PUD section following.

1. The total plat area consists of 67.5 acres, 4 acres of which are reserved for the existing home and outbuildings on the proposed Lot 1, Block 10. It is presumed that the lot description for the existing home site should be corrected to Block 11, as there is

another Block 10 with new development lots. The PUD zoning is recommended to be applied only to the 63.5 remaining acres, exempting Lot 1, Block 10(11) from those requirements. Staff proposes that Lot 1, Block 10(11) be zoned as R-1, Single Family Residential. To the extent that the existing home and building are inconsistent with the R-1 standards, those buildings would continue as legal non-conformities. Any future redevelopment of this parcel would be subject to the zoning standards and process applicable at the time of such redevelopment.

2. In regard to the existing residential use on Lot 1, Block 10(11), the future extension of municipal utilities will require utility planning considerations as part of the plat. As a condition of approval, the applicant is required to review options for the future extension of utilities to this lot. An agreement with the underlying property owner as related to the future utility connection timing will be a subject for City Council consideration as part of the annexation decision.
3. The 63.5 acres assigned to new development results in a gross density of 2.47 units per acre, and 3.33 units per acre (net of wetlands and storm ponding).
4. Staff recommends that the lots which back onto the gas line easement through the center of the plat area be reconfigured to extend to the centerlines of the easement, rather than leaving the easement as an outlot as shown in the current plat proposal. This is intended to avoid any future issues with this land being left to an unknown owner or returned to the state or county under tax forfeiture. Accurate easement will then be required to be shown on the lots within this area of the plat.
5. By reconfiguring those lots along the gas line, lot sizes increase in that area, and overall net density is recalculated as approximately 3.1 units per acre.
6. The plat configuration illustrates the mitigation of a wetland within Block 7. As the property is currently located with Monticello Township at present, the applicant will need to verify the current status of wetland permitting for this loss. The preliminary plat will not be scheduled for City Council review until this step is completed.
7. The applicant has proposed wetland buffers around the wetland complexes that are to be retained, but has not provided the required documentation of wetland quality to determine the width of the buffers and required wetland setbacks. The applicant will be required to provide a wetland quality evaluation to determine whether the buffers shown are adequate based on the Wetland Overlay District.
8. The plat includes a series of outlots that accommodate existing wetlands and/or stormwater improvements. It is assumed that these will be conveyed to the City at the time of the plat approvals given their stormwater and wetland functions. However, Outlots labeled “D” and the smaller “F” do not currently appear to have a purpose or

any improvements. Clarification of the purpose of these smaller outlot parcels and their inclusion for maintenance and ownership by an HOA is required. Staff recommends reviewing the outlots for the potential for mailbox clusters, again within the HOA as applicable.

9. In this regard, the applicants should specify with greater clarity the HOA management/maintenance throughout the proposed PUD, including for the parking bays that support 45 foot lots. Some of these utilize both public right of way and private outlot space. It is recommended that all of these parking bays be included within the HOA agreement.

10. The applicants note in the application materials that a Homeowner's Association (HOA) will be established for the 45 foot wide lots and would be the designated owner of the amenities in the project area. The plat is designed with full public streets – no private streets are shown. The narrative implies, but does not specify, the maintenance operations planned for those parcels. The HOA may provide exterior maintenance for the 45 foot parcels (such as snow removal and landscape maintenance), but this should be clarified as a part of the review and final conditions. The applicant has indicated that the HOA may not be created to provide individual exterior landscaping or snow removal. This will impact use and size of the garages to be constructed.

11. In the southeast corner of the plat, "Robin Street" is proposed to dead-end into the adjoining property to the east. There is significant grade in this area, including an upslope of Robin Street as it extends to the east termination point. The land to the east continues to rise. The applicants are encouraged to examine the elevation of Robin Street to meet this elevation issue and ensure that the easterly property can match this grade. In addition, a sketch plan and concept grading design for a small area of the adjoining property is required to ensure that this connection is proposed in a reasonable location.

12. The City Engineer's office has also noted the presence of large retaining wall structures within the plat, including one wall almost 8' in height on the east side of the plat, partially within an outlot and along private lots. The presence of a wall of this size will require further review. A preferable design would be that any wall construction of more than 5 feet in height be split into two parallel walls. It is recommended that the design not include any portion within the outlot that is to be deed to the City and that the retaining walls be included within an HOA managed area. Similarly, the retaining wall within the villa area will be required to be within an HOA managed area. Finally, the retaining wall shown within the gas line easement will require verification of allowance from the easement holder and similar inclusion in the HOA.

13. Robin Street will require some sort of turn-around facility at the point of its connection to the adjoining property to avoid cars having to back up out of the short dead end, and to accommodate City snow-removal operations (both snowplow maneuvering and snow storage location). The City Engineer has provided additional comment on this and other aspects of the plat design and its public improvements.
14. Street names as shown on the plat are subject to review and comment of Wright County per their emergency service naming convention requirements.
15. The applicants will be required to place a "Future Through Street" sign at this boundary to advise residents of the expected connection of this street to future development.
16. The applicant has provided a traffic memo with the plat. The City Engineer has provided comments as to this memo and street design. One of these comments includes the addition of curb bump outs at Fallon Drive and Tanager to slow traffic and allow pedestrian crossings. The plat shall be revised to meet this comment.
17. The plat area notes an exception in the southeast corner of the property of 50.05 feet by 50.05 feet, belonging and attached to the neighboring property owner to the south. It would be beneficial if this small exception were acquired by this development to avoid the currently shown disruption in rear lot line configuration. This area is not buildable for the adjoining property owner and is likely to raise some issues with lot line arrangement in the future. This note is not a baseline recommended condition of approval but is noted to encourage the applicants to pursue an acquisition and subsequent inclusion with this plat.
18. The applicant has not provided a phasing plan with the proposed plat. If the plat and PUD are intended to be developed in phases, a phasing plan is required for evaluation of utility extension, stormwater management and other considerations.

Park Dedication Recommendation

The Monticello Subdivision Ordinance requires the dedication of parkland or the equivalent cash-in-lieu of land as part of residential subdivision. The Monticello PARC met on April 24, 2025 to review the recommendation for parkland for the proposed Meadows at Pioneer Park. Due to the proximity of the plat to parks within ½ miles including Pioneer Park, Cardinal Hills Park, Montiview Park and Hunters Crossing Park, the PARC recommended a dedication that is primarily cash-in-lieu of parkland. Some land credit will be given for the proposed trail connection on the north side of the plat, but only that area which lies outside of the powerline easement in that area.

Planned Unit Development

There are two decision components applicable to the use of PUD for the project. One is consideration of the Development Stage PUD, a stage that incorporates the specific design and other site development aspects of the project proposed by the applicants. The second is the establishment of the PUD District with corresponding PUD zoning ordinance, and rezoning of the project area to this new district. The actions for Planning Commission consideration include both components, which are discussed below.

A. Development Stage PUD

The applicant has provided a table of housing development standards that are intended to establish the minimum building designs for this plat and PUD zoning district. The applicant has used the Traditional Neighborhood (T-N) standards as a comparison point for the standards. The applicant proposes the use of PUD to incorporate several fundamental departures from what the applicable zoning regulations would be, whether the T-N or R-1 districts were used as the baseline zoning. These standards are identified below, which are then followed with staff's analysis and recommendation. As a note, the building elevations provided by the applicant are intended as examples; it is the minimum design standards adopted as a part of the PUD District ordinance that will govern home design.

1. Minimum Lot Width: Proposed at minimum of 65 feet and 45 feet. These widths are a reduction from the R-1 standard of 70 feet and the T-N standard of 55 feet. The 15 feet of total side yard setback results in either 50 feet or 30 feet building widths, respectively.
2. Minimum Lot Area: Reduction to 6,300 square feet minimum for the 45 foot "Villa" lots. Of the 62 lots in this range, 20 are shown as being less than 7,000 square feet in area. A reduction to a minimum of 8,775 square feet for the single-family 65' lots. Of the 95 single-family lots, many will exceed 10,000 square feet in area pending the plat recommendation related to the gas line lot configuration.
3. Minimum Building Square Footage: For both lot sizes, the applicants propose a minimum building square footage of 934 square feet of finished space, with a minimum of 1,700 square feet of finishable space. This compares to the 1,050 square foot foundation, and 2,000 square foot finishable standard in both the R-1 and T-N districts. These square footage numbers have been commonly applied in other recent PUD projects.
4. Garages: The 65-foot lots are typically shown with either 2-car or 3-car garages, while the 45 foot lots show 2-car garages. The applicants propose a minimum garage floor area of 463 square feet for the 65 foot lots, and 392 square feet for the 45 square foot lots. This compares to a standard requirement for 480 square foot

garages in the R-1 District. As staff has noted in prior applications, smaller and especially narrower garages can make them functionally less usable for either car storage or other needs, such as refuse cans and other elements. Because the smaller units may not have snow and landscape maintenance through the HOA, refuse receptacles, maintenance equipment, and other garage storage are squeezed out when these dimensions shrink below certain levels.

5. Livable Frontage: The applicant has not specifically addressed the City's common requirement that at least 40% of the building width is to be livable space. The images show an upper level of living space over the garage – which would qualify under this standard – however, the 40% requirement will need to be specified in the PUD as these building graphics are for illustration purposes only – the developer will not be the builder in this plat. This can become an issue on the smaller lots, since 40% of a 30-foot wide building pad is 12 feet, leaving 18 feet of grade-level building for the garage. This would be too narrow to fit a standard two-car garage that can accommodate two vehicles. As such, the narrow-lot designs would all need to be of the tuck-under design with living space above to ensure compliance with this standard.
6. Materials: The applicant proposes a minimum requirement of 15% brick/stone, or a minimum of 10% brick/stone in combination with other siding patterns (such as board/batten, shake, etc.) to total 20%. Similar accommodations have been made for other recent projects – it is incumbent on the applicants to show how the elements of this PUD justify the departure from the City's standard. The base R-1 standard is 15% and the base T-N requirement is 20%.
7. Landscape: The landscaping plan originally provided for the full plat and PUD is available did not match the current PUD layout. The applicant has provided a revised landscaping plan, which staff did not yet have an opportunity to review. Regardless of that plan, the applicant's narrative proposes to vary from the City's requirement of 4 caliper inches of tree planting per street frontage, reducing the minimum requirement to one 2-1/2" caliper tree per lot. It is noted that landscape amenities are often an aspect of site development that serve as an element of increased quality and amenities in PUD development. Reducing tree planting is counter to the intent of PUD, and also to the City's interest in improving and increasing its tree cover under the recently completed tree survey and plan.

B. Rezoning to PUD

As with any PUD under the City's code, an ordinance establishing a specific PUD district for the proposed project is developed. The ordinance incorporates the various allowed uses,

performance standards, and any special process, phasing, or other aspect that will govern both the development and the long-term land use in the district. The PUD district is written specifically to incorporate the goals, objectives, standards, elements of flexibility, and other aspects of the project as submitted, modified, and eventually finally approved by the City Council. A draft PUD ordinance that includes the recommendations of staff related to the PUD standards has been prepared for review.

PUD Analysis & Recommendations

There are several standards that would be incumbent on any PUD project that proposes to be built with lot or housing dimensions that are less than the base zoning use standards corresponding to the Low Density Residential land use guidance. As discussed, PUD design requires additional features and amenities that serve to balance or build on the flexibility granted to the PUD.

As PUD proposals and smaller-lot concepts have increased in recent years, the City has agreed to design elements that have been used to support PUD variability. In the nearby Haven Ridge, the City and developer have identified a roundabout design for the intersection of new collector roads critical to long term growth in the area, as well as preservation of a large stand of existing woodlands that are visible and accessible to both residents of the project and the general public. In the recently approved Meadowbrook plat, the City and developer have been working on public uses within an imposing overhead powerline corridor, as well as a variety of housing styles from attached units to lots that are generally consistent with the R-1 standards. That project also facilitates an important infill project on previously platted land that had been idle for nearly two decades. Both of these projects also included design requirements which are intended to retain street-front building character.

For this project, the applicants suggest that efficiency of the project design helps to ensure affordability, and that the housing styles to fit these lots address market demand for smaller floor plans, common maintenance, and accessibility for those seeking one-level living. The applicants also note a preservation of natural resources (primarily the area in the northeast corner of the plat area, consisting of an existing wetland and steep hillside). The applicants also cite the trail segments connecting Pioneer Park with the area, and the existing neighborhood to Fallon Avenue and 85th Street.

In considering the application of PUD for the proposed project, the following have been outlined as potential issues and/or enhancements supporting the use of PUD.

- While the trail connections are a positive, they are a common improvement required of most plats.

- The open space in the northeast corner of the site is indeed a valuable resource, however, it is largely inaccessible, and out of sight for the general public. By law, wetlands are required to be retained unless otherwise permitted for mitigation.
- Staff is supportive of a diversity of housing choice as an important factor in maintaining a healthy housing market. Seniors, young people initiating family formation, and singles who neither need nor want extensive maintenance are served by this type of housing. However, it will be important for the final PUD to ensure consistency with the City's goals of quality, sustainable neighborhood design, justifying the other compromises made through the PUD request. Additional housing design amenities or project elements would better support the flexibility being considered for this project. Staff suggest the following:
    - Require one- or two-story units on all lots, prohibiting split-entry designs (none are shown as a part of the applicant's submission packet).
    - Prepare and enforce an "anti-monotony" policy for building design and materials on nearby parcels.
    - Retention of the recently required front porch and/or patio additions to site plan for all lots. To the extent that the current 40% living space width is compromised by the small lots, staff would recommend no less than 10 feet of livable area is maintained, leaving 20 feet of width for garage. Staff would also recommend the requirement for usable porches or the addition of extended front patio areas.
    - Where garage widths are less than 22 feet, staff would suggest that the garages be permitted to be lengthened, supporting a 25 foot front setback for the garage when the additional (but no more than) 5 feet of depth is added to garage dimension, and/or the City's 480 square feet requirement is maintained.
    - Common mail-station areas that can also serve as HOA maintained private open spaces, removing series of mailbox clusters along roadways that complicate on-street parking and add to the clutter of streetscape elements.
    - Robust landscaping, both in the common areas and on private property. In this regard, an enhanced landscape plan should be developed for common spaces in the project, especially at entrance points. Further, the applicant's request to reduce tree planting is counter to this objective. Staff would suggest – if the narrower lots dictate more restrictive tree planting locations, that additional side and rear-yard tree planting is established to help encourage a richer look to the area.

- Ensure that HOA requirements do not permit trash receptables to be left outside the garage other than on trash pickup day.
- As the applicant has suggested that common landscaping and snow removal may not be a service of the HOA, ensure that house and garage designs accommodate the reasonable needs of contemporary residential maintenance and occupancy.
- Ensure that no more than one minor (200 sf) accessory building is permitted on any lot.

- Lot Design: Given the extended block length of Block 10 – more than 1,000 feet in length, staff recommends the elimination of at least two of the 45' lots along Robin Street, located between Lots 14 and 15 of Block 10 toto provide a break in the street presence for the villa areas. This break can then include trail connections to the south, from Outlot D through gasline to the south, where a pedestrian corridor could be established.

STAFF RECOMMENDED ACTION

The Monticello 2040 Vision + Plan currently identifies a density range and a statement that smaller-lot development is acceptable in the Low Density Residential land use category.

As highlighted in this analysis, the proposed Meadows at Pioneer Park subdivision establishes a residential density that meets the 2050 Plan requirements. In that respect, staff is supportive of the Preliminary Plat request, subject to a number of conditions in Exhibit Z, the most significant of which is the acceptability of the Planned Unit Development for this project.

The Comprehensive Plan, Zoning District standards, and the PUD requirements (when appropriately applied) are intended to work together to create neighborhoods that meet the City's overall housing goals. The Development Stage PUD, which proposes several variations from what would otherwise be required by the expected zoning district (typically R-1 per language in the Comprehensive Plan, but also from the small-lot district of "T-N", Traditional Neighborhood), is recommended for approval only with the identified conditions in Exhibit Z, including both revisions and supplementary plan and detail submissions.

Because the Comprehensive Plan incorporates the concept of small-lot single family subdivision, the challenge is how to do so in ways that meet the other goals and objectives of the Plan.

The Exhibit Z document identifies the many conditions that staff recommends to achieve the goals of the Plan through application of PUD zoning. Several of these will result in changes to the Preliminary Plat itself, while others relate to design or specifics of the constructed project.

With these conditions, staff believes that the proposed subdivision can be found to comply with the requirements of the PUD zoning chapter, as well as the Monticello 2040 document.

SUPPORTING DATA

A. Resolution PC-2025-22, Development Stage PUD
B. Resolution PC-2025-23, Rezoning to PUD
C. Resolution PC-2025-21, Preliminary Plat
D. Draft Ordinance No. XXX
E. Aerial Site Image
F. Applicant Narrative
G. Certificate of Survey
H. Plans, Including:
    a. Site Plan
    b. Firetruck Turning Movement
    c. Grading Plan
    d. Utility Plan
    e. Street & Storm
    f. Water & Sanitation
    g. Erosion Control
    h. Wetland Buffer
    i. Sign Plan
    j. Sight Line
    k. SWPPP Narrative
    l. Lighting
    m. Landscaping & Tree
I. Stormwater Treatment Facilities Operations and Maintenance Plan
J. Wetland Delineation Notice of Decision
K. Traffic Study
L. City Engineer's Comment Letter and Plan Comments, dated April 30, 2025
Z. Conditions of Approval

EXHIBIT Z
Conditions of Approval
Preliminary Plat, Development Stage PUD and Rezoning to PUD
213100242201, 213100242202

1. The preliminary plat for the Meadows at Pioneer Park approval is conditioned on the approval of the Meadows at Pioneer Park PUD.
2. The current owner homestead parcel, currently identified as Lot, Block 10, is redesignated as Lot 1, Block 11.
3. The preliminary plat documents are revised to illustrate an appropriate option for utility extensions to Lot 1, Block 11. An agreement for the timing of connection to those services shall be completed between the City and owner of the subject parcel.
4. The rezoning to PUD includes all of the new development area, whereas Lot 1, Block 11 (the homestead parcel) is rezoned to R-1.
5. The plat is revised to extend lot lines to the center of the gas line easement, eliminating outlot in those areas (portions of Outlot B and Outlot F).
6. The site plan and other civil plans are revised to match the proposed preliminary plat for design, as well as lot and block numbering; lot tabulations shall be updated and consistent.
7. The plat is revised in Block 10 to add a break in the line of lots by eliminating one or two 45-foot lots, to provide a trail access that can connect to the gas line easement area, a potential pedestrian pathway. It is recommended that this break occur at the curve of Robin Street, between Lots 14 and 15 of Block 10. A similar break or realignment should be considered to the north of Robin Street in the same location (Lots 11 and 12, Block 9) to provide access to the Outlot D as an open space amenity, if it is retained for ownership by the HOA.
8. The applicant verifies the status of all wetland permitting, including the wetland mitigation in Block 7, prior to consideration of the preliminary plat by City Council.
9. The applicant verifies wetland buffer locations around wetland complexes based on a wetland quality evaluation, per requirements of the Wetland Overlay District.
10. The applicants identify ownership of the various outlots, as well as proposed improvements and amenities where applicable. Outlots containing wetlands and stormwater ponding shall be conveyed to the City. Other outlots may include

project amenities such as mail stations, other private open space, landscaping elements, etc. Outlot labeling shall be revised to avoid duplication.

11. The applicant provide private maintenance responsibility through the proposed Homeowners Association for the parking bays provided to the narrow-lot portions of the subdivision.

12. The applicant establishes the proposed Homeowner's Association (HOA) to ensure long-term ongoing maintenance of exterior areas of the 45-foot lot areas. If the HOA is not responsible for exterior maintenance, such as landscaping and snow removal, the applicants shall demonstrate adequate private storage for individual private maintenance equipment, including additional garage space.

13. The applicant works with the City Engineer's office to incorporate grading considerations for Robin Street, and with provide a reasonable plan to ensure that the location and its grading design will support a continuation of development onto the adjoining property.

14. Retaining walls that cross multiple parcels will be specifically required to be maintained by the HOA. Where the retaining walls are shown on any Outlot to be conveyed to the City, that wall shall be redesigned (or lot configurations redesigned) to keep the wall on private property only.

15. The large (up to eight feet high) retaining wall along the east boundary of the development shall be redesigned to be two parallel walls at any point such wall is greater than 5 feet in height.

16. The applicant works with the City Engineer's office to identify an appropriate temporary turn-around facility for the end of Robin Street, and any other streets that will dead-end during any phase of the project.

17. The applicant provide a "Future Through Street" sign per instructions of the City Engineer's office for any temporary dead-end street location.

18. Street names are revised to meet Wright County naming requirements.

19. Curb extensions on plat streets shall be provided at the direction of the City Engineer.

20. A sketch plan and concept grading design for a small area of the adjoining property is required to ensure that this connection is proposed in a reasonable location.

21. The applicant shall provide a phasing plan if applicable to the development and plat.

22. Garages are established to have a minimum width of 20 feet, and a minimum depth of 24 feet to ensure adequate space for parking, accessibility, and garage storage needs. Where garage designs result in a width of less than 22 feet, consider permitting the garage face to project a maximum of 5 feet into the front setback, in front of the front entry by that same 5 foot distance, permitting a deeper garage design for additional floor area.

23. The applicants ensure that the City's 40% livable width requirement is met, and when this dimension incorporates livable space above a tuck-under garage, that ground-floor livable space is not less than 10 feet in width facing the street; all lots shall include usable porches or extended front patio areas.

24. Provide for one- or two-story units on all lots, prohibiting split entry designs, consistent with the submitted housing illustration examples.

25. The PUD shall be established to require a minimum requirement of 15% brick/stone, or a minimum of 10% brick/stone in combination with other siding patterns (such as board/batten, shake, etc.) to total 20%.

26. The landscape plan is updated and upgraded to increase (rather than decrease) tree planting above the minimum code standard of 4 caliper inches per street frontage. Emphasis on additional front-yard planting (utilizing smaller ornamentals where overstory trees do not fit), and in prominent corner locations, is encouraged as a part of the landscaping plan.

27. Prepare and enforce an "anti-monotony" policy for building design and materials on nearby parcels.

28. Design and enhance common open-space amenities on the reserved outlots, including visitor parking, common mail stations, landscaping, and other elements.

29. Identify and provide for various front porch and/or patio improvements for all homes in the subdivision.

30. Provide for interior storage of trash receptacles only by HOA enforcement.

31. Limit accessory building construction on all lots to one such building of no more than 200 square feet.

32. The applicant shall revise the table of lot and building standards as provided in the application narrative consistent with the City's approval, for purposes of inclusion in the PUD ordinance establishing the PUD minimum standards.

33. Compliance with the terms of the City's Engineering Staff letter and plan comments dated April 30, 2025.

34. Comments and recommendations of other Staff and Planning Commission.

CITY OF MONTICELLO
WRIGHT COUNTY, MINNESOTA
PLANNING COMMISSION
RESOLUTION NO. PC 2025-022

RECOMMENDING A DEVELOPMENT STAGE PUD FOR MEADOWS AT PIONEER PARK PLANNED UNIT DEVELOPMENT DISTRICT, A 157 UNIT SINGLE FAMILY DETACHED DEVELOPMENT

***WHEREAS*,** the applicant is seeking a Development Stage Planned Unit Development approval for a single family residential project, consisting of up to 157 residential units, to be platted pursuant to the concurrent request for the Meadows at Pioneer Park plat; and

WHEREAS, the proposed Meadows at Pioneer Park PUD District would create the uses and standards applicable to all development in the Meadows at Pioneer Park plat, to consist of a series of public streets serving residential units and lot as designated on the approved Preliminary Plat subject to the Meadows at Pioneer park Planned Unit Development zoning district; and

WHEREAS, the site is concurrently subject to requests for a preliminary plat for the proposed project, and a Development Stage PUD approval for the Meadows at Pioneer Park PUD District; and

WHEREAS, the proposed PUD and its associated plat creates a dedication for public easements, and adequate right of way related to public streets along with drainage and utilities which will serve various phases of the PUD; and

WHEREAS, the subject parcels will be consistent with requirements of the City's Subdivision and Zoning Ordinance requirements under the adopted Meadows at Pioneer Park PUD District standards, as well as other applicable standards of the Monticello Zoning Ordinance; and

WHEREAS, the subject property will be developed under the requirements of the Monticello Comprehensive Plan, which designate the land use for the property as Low Density Residential; and

***WHEREAS*,** the Planning Commission has reviewed the application for the Amendment to the Zoning Ordinance pursuant to the regulations of the applicable ordinances and land use plans and policies; and

***WHEREAS*,** the Planning Commission held a public hearing on May 6th, 2025 on the application and the applicant and members of the public were provided the opportunity to present information to the Planning Commission; and

WHEREAS, the Planning Commission has considered all of the comments and the staff report, which are incorporated by reference into the resolution, and make the following Findings of Fact in relation to the recommendation of approval:

1. The proposed Development Stage PUD is consistent with the existing nearby uses, and provides the potential for development consistent with the intent and purpose of the plans, goals, and policies of the Monticello Comprehensive Plan related to the Low Density Residential land use category.
2. The proposed uses will be consistent with the existing and future land uses in the area in which they are located, and the development is adequately served by existing and proposed roadways.
3. The impacts of the improvements are those anticipated by the existing and future land uses and are addressed through standard review and ordinances as adopted.
4. The proposed PUD and the associated development plans accommodate additional public and private improvements, including streets, utilities, and stormwater controls that ensure the project will continue to be consistent with the City's long-term public service infrastructure.
5. The proposed PUD does not interfere with reasonable extensions of development and infrastructure to serve other undeveloped property in the area.
6. As a property which has been agricultural for many years, but which has been anticipated to be developed for Low Density Residential uses, the proposed PUD is not anticipated to negatively impact surrounding properties or values.
7. Approval of the PUD will not result in the need for additional road or utility infrastructure other than that being provided by and for the proposed use, and should not otherwise negatively impact the health or safety of the community.

NOW, THEREFORE, BE IT RESOLVED, by the Planning Commission of the City of Monticello, Minnesota that the Planning Commission hereby recommends to the City Council that the proposed Development Stage Planned Unit Development of the Meadows at Pioneer Park, be approved subject to the conditions of Exhibit Z of the staff report, as follows:

1. The preliminary plat for the Meadows at Pioneer Park approval is conditioned on the approval of the Meadows at Pioneer Park PUD.
2. The current owner homestead parcel, currently identified as Lot, Block 10, is redesignated as Lot 1, Block 11.
3. The preliminary plat documents are revised to illustrate an appropriate option for utility extensions to Lot 1, Block 11. An agreement for the timing of

connection to those services shall be completed between the City and owner of the subject parcel.

4. The rezoning to PUD includes all of the new development area, whereas Lot 1, Block 11 (the homestead parcel) is rezoned to R-1.

5. The plat is revised to extend lot lines to the center of the gas line easement, eliminating outlot in those areas (portions of Outlot B and Outlot F).

6. The site plan and other civil plans are revised to match the proposed preliminary plat for design, as well as lot and block numbering; lot tabulations shall be updated and consistent.

7. The plat is revised in Block 10 to add a break in the line of lots by eliminating one or two 45-foot lots, to provide a trail access that can connect to the gas line easement area, a potential pedestrian pathway. It is recommended that this break occur at the curve of Robin Street, between Lots 14 and 15 of Block 10. A similar break or realignment should be considered to the north of Robin Street in the same location (Lots 11 and 12, Block 9) to provide access to the Outlot D as an open space amenity, if it is retained for ownership by the HOA.

8. The applicant verifies the status of all wetland permitting, including the wetland mitigation in Block 7, prior to consideration of the preliminary plat by City Council.

9. The applicant verifies wetland buffer locations around wetland complexes based on a wetland quality evaluation, per requirements of the Wetland Overlay District.

10. The applicants identify ownership of the various outlots, as well as proposed improvements and amenities where applicable. Outlots containing wetlands and stormwater ponding shall be conveyed to the City. Other outlots may include project amenities such as mail stations, other private open space, landscaping elements, etc. Outlot labeling shall be revised to avoid duplication.

11. The applicant provide private maintenance responsibility through the proposed Homeowners Association for the parking bays provided to the narrow-lot portions of the subdivision.

12. The applicant establishes the proposed Homeowner's Association (HOA) to ensure long-term ongoing maintenance of exterior areas of the 45-foot lot areas. If the HOA is not responsible for exterior maintenance, such as landscaping and snow removal, the applicants shall demonstrate adequate private storage for individual private maintenance equipment, including additional garage space.

13. The applicant works with the City Engineer's office to incorporate grading considerations for Robin Street, and with provide a reasonable plan to ensure that the location and its grading design will support a continuation of development onto the adjoining property.

14. Retaining walls that cross multiple parcels will be specifically required to be maintained by the HOA. Where the retaining walls are shown on any Outlot to be conveyed to the City, that wall shall be redesigned (or lot configurations redesigned) to keep the wall on private property only.

15. The large (up to eight feet high) retaining wall along the east boundary of the development shall be redesigned to be two parallel walls at any point such wall is greater than 5 feet in height.

16. The applicant works with the City Engineer's office to identify an appropriate temporary turn-around facility for the end of Robin Street, and any other streets that will dead-end during any phase of the project.

17. The applicant provide a "Future Through Street" sign per instructions of the City Engineer's office for any temporary dead-end street location.

18. Street names are revised to meet Wright County naming requirements.

19. Curb extensions on plat streets shall be provided at the direction of the City Engineer.

20. A sketch plan and concept grading design for a small area of the adjoining property is required to ensure that this connection is proposed in a reasonable location.

21. The applicant shall provide a phasing plan if applicable to the development and plat.

22. Garages are established to have a minimum width of 20 feet, and a minimum depth of 24 feet to ensure adequate space for parking, accessibility, and garage storage needs. Where garage designs result in a width of less than 22 feet, consider permitting the garage face to project a maximum of 5 feet into the front setback, in front of the front entry by that same 5 foot distance, permitting a deeper garage design for additional floor area.

23. The applicants ensure that the City's 40% livable width requirement is met, and when this dimension incorporates livable space above a tuck-under garage, that ground-floor livable space is not less than 10 feet in width facing the street; all lots shall include usable porches or extended front patio areas.

24. Provide for one- or two-story units on all lots, prohibiting split entry designs, consistent with the submitted housing illustration examples.

25. The PUD shall be established to require a minimum requirement of 15% brick/stone, or a minimum of 10% brick/stone in combination with other siding patterns (such as board/batten, shake, etc.) to total 20%.

26. The landscape plan is updated and upgraded to increase (rather than decrease) tree planting above the minimum code standard of 4 caliper inches per street frontage. Emphasis on additional front-yard planting (utilizing smaller ornamentals where overstory trees do not fit), and in prominent corner locations, is encouraged as a part of the landscaping plan.

27. Prepare and enforce an "anti-monotony" policy for building design and materials on nearby parcels.

28. Design and enhance common open-space amenities on the reserved outlots, including visitor parking, common mail stations, landscaping, and other elements.

29. Identify and provide for various front porch and/or patio improvements for all homes in the subdivision.

30. Provide for interior storage of trash receptacles only by HOA enforcement.

31. Limit accessory building construction on all lots to one such building of no more than 200 square feet.

32. The applicant shall revise the table of lot and building standards as provided in the application narrative consistent with the City's approval, for purposes of inclusion in the PUD ordinance establishing the PUD minimum standards.

33. Compliance with the terms of the City's Engineering Staff letter and plan comments dated April 30, 2025.

34. Comments and recommendations of other Staff and Planning Commission.

ADOPTED this 6th day of May, 2025 by the Planning Commission of the City of Monticello, Minnesota.

MONTICELLO PLANNING COMMISSION

By: _____

Andrew Tapper, Chair

ATTEST:

_____

Angela Schumann, Community Development Director

CITY OF MONTICELLO
WRIGHT COUNTY, MINNESOTA
PLANNING COMMISSION
RESOLUTION NO. PC 2025-023

RECOMMENDING THE ESTBLISHMENT OF THE
MEADOWS AT PIONEER PARK PLANNED UNIT DEVELOPMENT DISTRICT,
AND REZONING THE SUBJECT PROPERTY
(BLOCKS 1-10 OF MEADOWS AT PIONEER PARK PLAT) TO
MEADOWS AT PIONEER PARK PUD DISTRICT AND REZONING BLOCK 1, LOT 11 TO R-1 (SINGLE-FMAIY RESIDENTIAL)

WHEREAS, the applicant is seeking a Planned Unit Development for a single family residential project, consisting of up to157 residential units, to be platted pursuant to the concurrent request for the Meadows at Pioneer Park plat; and

WHEREAS, the proposed Meadows at Pioneer Park PUD District would create the uses and standards applicable to all development in the Meadows at Pioneer Park plat, to consist of a series of public streets serving residential units and lot as designated on the approved Preliminary Plat subject to the Meadows at Pioneer Park Planned Unit Development zoning district; and

WHEREAS, the site is concurrently subject to requests for a preliminary plat for the proposed project, and a Development Stage PUD approval for the Meadows at Pioneer Park PUD District; and

WHEREAS, the proposed PUD and its associated plat creates a dedication for public easements, and adequate right of way related to public streets along with drainage and utilities which will serve various phases of the PUD; and

WHEREAS, there is an existing single-family homestead to be platted with the Meadows at Pioneer Park, which shall not be included within the proposed Meadows at Pioneer Park PUD but annexed to the City and zoned R-1 (Singel-Family Residential); and

WHEREAS, the subject parcels will be consistent with requirements of the City's Subdivision and Zoning Ordinance requirements under the adopted Meadows at Pioneer Park PUD District standards, as well as other applicable standards of the Monticello Zoning Ordinance; and

WHEREAS, the subject property will be developed under the requirements of the Monticello Comprehensive Plan, which designate the land use for the property as Low Density Residential; and

CITY OF MONTICELLO
WRIGHT COUNTY, MINNESOTA
PLANNING COMMISSION
RESOLUTION NO. PC 2025-023

***WHEREAS*,** the Planning Commission has reviewed the application for the Amendment to the Zoning Ordinance pursuant to the regulations of the applicable ordinances and land use plans and policies; and

***WHEREAS*,** the Planning Commission held a public hearing on May 6th, 2025 on the application and the applicant and members of the public were provided the opportunity to present information to the Planning Commission; and

WHEREAS, the Planning Commission has considered all of the comments and the staff report, which are incorporated by reference into the resolution, and make the following Findings of Fact in relation to the recommendation of approval:

1. The proposed Zoning District is consistent with the existing nearby uses, and provides the potential for development consistent with the intent and purpose of the plans, goals, and policies of the Monticello Comprehensive Plan related to the Low Density Residential land use category.
2. The proposed uses will be consistent with the existing and future land uses in the area in which they are located, and the development is adequately served by existing and proposed roadways.
3. The impacts of the improvements are those anticipated by the existing and future land uses and are addressed through standard review and ordinances as adopted.
4. The proposed PUD District and the associated development plans accommodate additional public and private improvements, including streets, utilities, and stormwater controls that ensure the project will continue to be consistent with the City's long-term public service infrastructure.
5. The proposed PUD does not interfere with reasonable extensions of development and infrastructure to serve other undeveloped property in the area.
6. As a property which has been agricultural for many years, but which has been anticipated to be developed for Low Density Residential uses, the proposed PUD is not anticipated to negatively impact surrounding properties or values.
7. Approval of the PUD will not result in the need for additional road or utility infrastructure other than that being provided by and for the proposed use, and should not otherwise negatively impact the health or safety of the community.

NOW, THEREFORE, BE IT RESOLVED, by the Planning Commission of the City of Monticello, Minnesota that the Planning Commission hereby recommends to the City Council that the proposed amendment to the Monticello Zoning Ordinance establishing the Meadows at

CITY OF MONTICELLO
WRIGHT COUNTY, MINNESOTA
PLANNING COMMISSION
RESOLUTION NO. PC 2025-023

Pioneer Park PUD District, and rezoning the area being platted as the Meadows at Pioneer Park PUD District, and that the rezoning of the proposed Lot 1, Block 11 be rezoned as R-1 Singel-Family Residential) be approved subject to the conditions of Exhibit Z of the staff report, as follows:

1. The preliminary plat for the Meadows at Pioneer Park approval is conditioned on the approval of the Meadows at Pioneer Park PUD.
2. The current owner homestead parcel, currently identified as Lot, Block 10, is redesignated as Lot 1, Block 11.
3. The preliminary plat documents are revised to illustrate an appropriate option for utility extensions to Lot 1, Block 11. An agreement for the timing of connection to those services shall be completed between the City and owner of the subject parcel.
4. The rezoning to PUD includes all of the new development area, whereas Lot 1, Block 11 (the homestead parcel) is rezoned to R-1.
5. The plat is revised to extend lot lines to the center of the gas line easement, eliminating outlot in those areas (portions of Outlot B and Outlot F).
6. The site plan and other civil plans are revised to match the proposed preliminary plat for design, as well as lot and block numbering; lot tabulations shall be updated and consistent.
7. The plat is revised in Block 10 to add a break in the line of lots by eliminating one or two 45-foot lots, to provide a trail access that can connect to the gas line easement area, a potential pedestrian pathway. It is recommended that this break occur at the curve of Robin Street, between Lots 14 and 15 of Block 10. A similar break or realignment should be considered to the north of Robin Street in the same location (Lots 11 and 12, Block 9) to provide access to the Outlot D as an open space amenity, if it is retained for ownership by the HOA.
8. The applicant verifies the status of all wetland permitting, including the wetland mitigation in Block 7, prior to consideration of the preliminary plat by City Council.
9. The applicant verifies wetland buffer locations around wetland complexes based on a wetland quality evaluation, per requirements of the Wetland Overlay District.

10. The applicants identify ownership of the various outlots, as well as proposed improvements and amenities where applicable. Outlots containing wetlands and stormwater ponding shall be conveyed to the City. Other outlots may include project amenities such as mail stations, other private open space, landscaping elements, etc. Outlot labeling shall be revised to avoid duplication.

11. The applicant provide private maintenance responsibility through the proposed Homeowners Association for the parking bays provided to the narrow-lot portions of the subdivision.

12. The applicant establishes the proposed Homeowner's Association (HOA) to ensure long-term ongoing maintenance of exterior areas of the 45-foot lot areas. If the HOA is not responsible for exterior maintenance, such as landscaping and snow removal, the applicants shall demonstrate adequate private storage for individual private maintenance equipment, including additional garage space.

13. The applicant works with the City Engineer's office to incorporate grading considerations for Robin Street, and with provide a reasonable plan to ensure that the location and its grading design will support a continuation of development onto the adjoining property.

14. Retaining walls that cross multiple parcels will be specifically required to be maintained by the HOA. Where the retaining walls are shown on any Outlot to be conveyed to the City, that wall shall be redesigned (or lot configurations redesigned) to keep the wall on private property only.

15. The large (up to eight feet high) retaining wall along the east boundary of the development shall be redesigned to be two parallel walls at any point such wall is greater than 5 feet in height.

16. The applicant works with the City Engineer's office to identify an appropriate temporary turn-around facility for the end of Robin Street, and any other streets that will dead-end during any phase of the project.

17. The applicant provide a "Future Through Street" sign per instructions of the City Engineer's office for any temporary dead-end street location.

18. Street names are revised to meet Wright County naming requirements.

19. Curb extensions on plat streets shall be provided at the direction of the City Engineer.

20. A sketch plan and concept grading design for a small area of the adjoining property is required to ensure that this connection is proposed in a reasonable location.

21. The applicant shall provide a phasing plan if applicable to the development and plat.

22. Garages are established to have a minimum width of 20 feet, and a minimum depth of 24 feet to ensure adequate space for parking, accessibility, and garage storage needs. Where garage designs result in a width of less than 22 feet, consider permitting the garage face to project a maximum of 5 feet into the front setback, in front of the front entry by that same 5 foot distance, permitting a deeper garage design for additional floor area.

23. The applicants ensure that the City's 40% livable width requirement is met, and when this dimension incorporates livable space above a tuck-under garage, that ground-floor livable space is not less than 10 feet in width facing the street; all lots shall include usable porches or extended front patio areas.

24. Provide for one- or two-story units on all lots, prohibiting split entry designs, consistent with the submitted housing illustration examples.

25. The PUD shall be established to require a minimum requirement of 15% brick/stone, or a minimum of 10% brick/stone in combination with other siding patterns (such as board/batten, shake, etc.) to total 20%.

26. The landscape plan is updated and upgraded to increase (rather than decrease) tree planting above the minimum code standard of 4 caliper inches per street frontage. Emphasis on additional front-yard planting (utilizing smaller ornamentals where overstory trees do not fit), and in prominent corner locations, is encouraged as a part of the landscaping plan.

27. Prepare and enforce an "anti-monotony" policy for building design and materials on nearby parcels.

28. Design and enhance common open-space amenities on the reserved outlots, including visitor parking, common mail stations, landscaping, and other elements.

29. Identify and provide for various front porch and/or patio improvements for all homes in the subdivision.

CITY OF MONTICELLO
WRIGHT COUNTY, MINNESOTA
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RESOLUTION NO. PC 2025-023

30. Provide for interior storage of trash receptacles only by HOA enforcement.

31. Limit accessory building construction on all lots to one such building of no more than 200 square feet.

32. The applicant shall revise the table of lot and building standards as provided in the application narrative consistent with the City's approval, for purposes of inclusion in the PUD ordinance establishing the PUD minimum standards.

33. Compliance with the terms of the City's Engineering Staff letter and plans dated April 30, 2025.

34. Comments and recommendations of other Staff and Planning Commission.

ADOPTED this 6th day of May, 2025 by the Planning Commission of the City of Monticello, Minnesota.

MONTICELLO PLANNING COMMISSION

By: _____

Andrew Tapper, Chair

ATTEST:

_____

Angela Schumann, Community Development Director

CITY OF MONTICELLO
WRIGHT COUNTY, MINNESOTA
PLANNING COMMISSION
RESOLUTION NO. PC 2025-021

RECOMMENDING APPROVAL OF A PRELIMINARY PLAT FOR
MEADOWS AT PIONEER PARK,
A 157 UNIT SINGLE FAMILY DETACHED DEVELOPMENT

WHEREAS, the applicant is seeking a Preliminary Plat approval for a single family residential project, consisting of up to 157 residential units, to be platted pursuant to the concurrent request for the Meadows at Pioneer Park plat under the Meadows at Pioneer Park PUD District; and

WHEREAS, the proposed Meadows at Pioneer Park PUD is to consist of a series of public streets serving residential units and lot as designated on the approved Preliminary Plat subject to the Meadows at Pioneer park Planned Unit Development zoning district; and

WHEREAS, the site is concurrently subject to requests for and a Development Stage PUD approval as the Meadows at Pioneer Park PUD District; and

WHEREAS, the proposed PUD and its associated plat creates a dedication for public easements, and adequate right of way related to public streets along with drainage and utilities which will serve various phases of the PUD; and

WHEREAS, the subject parcels will be consistent with requirements of the City's Subdivision and Zoning Ordinance requirements under the adopted Meadows at Pioneer Park PUD District standards, as well as other applicable standards of the Monticello Zoning Ordinance; and

WHEREAS, the subject property will be developed under the requirements of the Monticello Comprehensive Plan, which designate the land use for the property as Low Density Residential; and

WHEREAS, the Planning Commission has reviewed the application for the Amendment to the Zoning Ordinance pursuant to the regulations of the applicable ordinances and land use plans and policies; and

WHEREAS, the Planning Commission held a public hearing on May 6th, 2025 on the application and the applicant and members of the public were provided the opportunity to present information to the Planning Commission; and

CITY OF MONTICELLO
WRIGHT COUNTY, MINNESOTA
PLANNING COMMISSION
RESOLUTION NO. PC 2025-021

WHEREAS, the Planning Commission has considered all of the comments and the staff report, which are incorporated by reference into the resolution, and make the following Findings of Fact in relation to the recommendation of approval:

1. The proposed Preliminary Plat is consistent with the existing nearby uses, and provides the potential for development consistent with the intent and purpose of the plans, goals, and policies of the Monticello Comprehensive Plan related to the Low Density Residential land use category.
2. The proposed uses will be consistent with the existing and future land uses in the area in which they are located, and the development is adequately served by existing and proposed roadways.
3. The impacts of the improvements are those anticipated by the existing and future land uses and are addressed through standard review and ordinances as adopted.
4. The proposed Preliminary Plat and the associated development plans accommodate additional public and private improvements, including streets, utilities, and stormwater controls that ensure the project will continue to be consistent with the City's long-term public service infrastructure.
5. The proposed Preliminary Plat does not interfere with reasonable extensions of development and infrastructure to serve other undeveloped property in the area.
6. As a property which has been agricultural for many years, but which has been anticipated to be developed for Low Density Residential uses, the proposed Preliminary Plat is not anticipated to negatively impact surrounding properties or values.
7. Approval of the Preliminary Plat will not result in the need for additional road or utility infrastructure other than that being provided by and for the proposed use, and should not otherwise negatively impact the health or safety of the community.

NOW, THEREFORE, BE IT RESOLVED, by the Planning Commission of the City of Monticello, Minnesota that the Planning Commission hereby recommends to the City Council that the proposed Preliminary Plat, subject to the Meadows at Pioneer Park PUD District, be approved subject to the conditions of Exhibit Z of the staff report, as follows:

1. The preliminary plat for the Meadows at Pioneer Park approval is conditioned on the approval of the Meadows at Pioneer Park PUD.
2. The current owner homestead parcel, currently identified as Lot, Block 10, is redesignated as Lot 1, Block 11.

3. The preliminary plat documents are revised to illustrate an appropriate option for utility extensions to Lot 1, Block 11. An agreement for the timing of connection to those services shall be completed between the City and owner of the subject parcel.

4. The rezoning to PUD includes all of the new development area, whereas Lot 1, Block 11 (the homestead parcel) is rezoned to R-1.

5. The plat is revised to extend lot lines to the center of the gas line easement, eliminating outlot in those areas (portions of Outlot B and Outlot F).

6. The site plan and other civil plans are revised to match the proposed preliminary plat for design, as well as lot and block numbering; lot tabulations shall be updated and consistent.

7. The plat is revised in Block 10 to add a break in the line of lots by eliminating one or two 45-foot lots, to provide a trail access that can connect to the gas line easement area, a potential pedestrian pathway. It is recommended that this break occur at the curve of Robin Street, between Lots 14 and 15 of Block 10. A similar break or realignment should be considered to the north of Robin Street in the same location (Lots 11 and 12, Block 9) to provide access to the Outlot D as an open space amenity, if it is retained for ownership by the HOA.

8. The applicant verifies the status of all wetland permitting, including the wetland mitigation in Block 7, prior to consideration of the preliminary plat by City Council.

9. The applicant verifies wetland buffer locations around wetland complexes based on a wetland quality evaluation, per requirements of the Wetland Overlay District.

10. The applicants identify ownership of the various outlots, as well as proposed improvements and amenities where applicable. Outlots containing wetlands and stormwater ponding shall be conveyed to the City. Other outlots may include project amenities such as mail stations, other private open space, landscaping elements, etc. Outlot labeling shall be revised to avoid duplication.

11. The applicant provide private maintenance responsibility through the proposed Homeowners Association for the parking bays provided to the narrow-lot portions of the subdivision.

12. The applicant establishes the proposed Homeowner's Association (HOA) to ensure long-term ongoing maintenance of exterior areas of the 45-foot lot areas. If the HOA is not responsible for exterior maintenance, such as landscaping and snow removal, the applicants shall demonstrate adequate private storage for individual private maintenance equipment, including additional garage space.

13. The applicant works with the City Engineer's office to incorporate grading considerations for Robin Street, and with provide a reasonable plan to ensure that the location and its grading design will support a continuation of development onto the adjoining property.

14. Retaining walls that cross multiple parcels will be specifically required to be maintained by the HOA. Where the retaining walls are shown on any Outlot to be conveyed to the City, that wall shall be redesigned (or lot configurations redesigned) to keep the wall on private property only.

15. The large (up to eight feet high) retaining wall along the east boundary of the development shall be redesigned to be two parallel walls at any point such wall is greater than 5 feet in height.

16. The applicant works with the City Engineer's office to identify an appropriate temporary turn-around facility for the end of Robin Street, and any other streets that will dead-end during any phase of the project.

17. The applicant provide a "Future Through Street" sign per instructions of the City Engineer's office for any temporary dead-end street location.

18. Street names are revised to meet Wright County naming requirements.

19. Curb extensions on plat streets shall be provided at the direction of the City Engineer.

20. A sketch plan and concept grading design for a small area of the adjoining property is required to ensure that this connection is proposed in a reasonable location.

21. The applicant shall provide a phasing plan if applicable to the development and plat.

22. Garages are established to have a minimum width of 20 feet, and a minimum depth of 24 feet to ensure adequate space for parking, accessibility, and garage storage needs. Where garage designs result in a width of less than 22 feet,

consider permitting the garage face to project a maximum of 5 feet into the front setback, in front of the front entry by that same 5 foot distance, permitting a deeper garage design for additional floor area.

23. The applicants ensure that the City's 40% livable width requirement is met, and when this dimension incorporates livable space above a tuck-under garage, that ground-floor livable space is not less than 10 feet in width facing the street; all lots shall include usable porches or extended front patio areas.

24. Provide for one- or two-story units on all lots, prohibiting split entry designs, consistent with the submitted housing illustration examples.

25. The PUD shall be established to require a minimum requirement of 15% brick/stone, or a minimum of 10% brick/stone in combination with other siding patterns (such as board/batten, shake, etc.) to total 20%.

26. The landscape plan is updated and upgraded to increase (rather than decrease) tree planting above the minimum code standard of 4 caliper inches per street frontage. Emphasis on additional front-yard planting (utilizing smaller ornamentals where overstory trees do not fit), and in prominent corner locations, is encouraged as a part of the landscaping plan.

27. Prepare and enforce an "anti-monotony" policy for building design and materials on nearby parcels.

28. Design and enhance common open-space amenities on the reserved outlots, including visitor parking, common mail stations, landscaping, and other elements.

29. Identify and provide for various front porch and/or patio improvements for all homes in the subdivision.

30. Provide for interior storage of trash receptacles only by HOA enforcement.

31. Limit accessory building construction on all lots to one such building of no more than 200 square feet.

32. The applicant shall revise the table of lot and building standards as provided in the application narrative consistent with the City's approval, for purposes of inclusion in the PUD ordinance establishing the PUD minimum standards.

33. Compliance with the terms of the City's Engineering Staff letter and plan comments dated April 30, 2025.

CITY OF MONTICELLO
WRIGHT COUNTY, MINNESOTA
PLANNING COMMISSION
RESOLUTION NO. PC 2025-021

34. Comments and recommendations of other Staff and Planning Commission.

ADOPTED this 6th day of May, 2025 by the Planning Commission of the City of Monticello, Minnesota.

MONTICELLO PLANNING COMMISSION

By: _____

Andrew Tapper, Chair

ATTEST:

_____

Angela Schumann, Community Development Director

ORDINANCE NO. ___

CITY OF MONTICELLO
WRIGHT COUNTY, MINNESOTA

AN ORDINANCE AMENDING TITLE XV, § 153.047 OF THE MONTICELLO CITY CODE, KNOWN AS THE ZONING ORDINANCE, ESTABLISHING THE MEADOWS AT PIONEER PARK PLANNED UNIT DEVELOPMENT DISTRICT AND REZONING THE FOLLOWING DESCRIBED PROPERTY TO MEADOWS AT PIONEER PARK PUD:

PLAT OF MEADOWS AT PIONEER PARK BLOCKS 1 THROUGH 10;
AND

REZONING THE FOLLOWING DESCRIBED PROPERTY TO R-1, SINGLE FAMILY RESIDENTIAL:

LOT 1, BLOCK 11, MEADOWS AT PIONEER PARK

***THE CITY COUNCIL OF THE CITY OF MONTICELLO HEREBY ORDAINS*:**

Section 1. Section § 153.047, PUD Districts, is hereby amended to add the following:

(??) Meadows at Pioneer Park PUD District

(1) Purpose. The purpose of the Meadows at Pioneer Park PUD District is to provide for the development of certain real estate subject to the Meadows at Pioneer Park Planned Unit Development District for single family residential land uses.

(2) This PUD ordinance shall not apply to Lot 1, Block 11 of the Meadows at Pioneer Park plat.

(3) Phased Development. The Meadows at Pioneer Park PUD District will be developed in phases, pursuant to the approved phasing plans. Subsequent phases, although plat names may change, shall continue to be zoned and regulated under the Meadows at Pioneer Park PUD district, as may be amended.

(3) Permitted Principal Uses. Permitted principal uses in the Meadows at Pioneer Park PUD District shall be single family detached uses on all lots as shown in the Meadows at Pioneer Park Preliminary Plat dated _____, subject to the conditions of approval imposed by City Council Resolutions 2025-XX and 2025-XX and subject to approved Final Stage PUD Development Plans and development agreement dated Council, and as may be further amended. Each individual use is limited to the location

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and building identified on the Final PUD Development Plans. No other principal use shall be allowed in the Meadows at Pioneer Park PUD District, with the exception that public uses on public property shall not be subject to this limitation. The introduction of any other use or change in density shall be reviewed under the requirements of the Monticello Zoning Ordinance, 153.028(O)(9)(b) – Planned Unit Developments for Development Stage PUD.

(4) Accessory Uses. Allowed Accessory Uses in the Meadowbrook PUD District shall be those as allowed in the T-N, Traditional Neighborhood zoning district, except that no Accessory Building shall exceed 200 square feet of floor area, or 10 feet in height, nor shall such accessory building be located in any yard other than the rear yard. No more than one such accessory building may be allowed on any lot in the PUD District. No outdoor storage or display may be allowed, other than as specifically identified on the Final Stage PUD Development Plans, and shall in all other cases adhere to the applicable general standards for accessory uses and buildings of the Monticello Zoning Ordinance. If the general standards are more restrictive or conflict with this section, the more restrictive shall apply, with the exception that notwithstanding any general ordinance related to architectural appearance, accessory buildings shall be constructed to match the principal building in both siding and roofing color.

(5) District performance standards. Performance standards for the development of any lot in the Meadows and Pioneer Park PUD District shall adhere to the approved Development Stage PUD Plans dated _____, subject to the conditions of approval imposed by City Council Council Resolution Nos. _____, and development agreement.

(6) The specific flexibility and conditions of the Meadows at Pioneer Park PUD District shall be as follows

A. The minimum lot standards for the Single Family detached dwellings shall be as shown on the approved Development Stage PUD plans and Preliminary Plat and as per the standards set forth in Table 1 of this ordinance.

B. The PUD provides flexibility from building spacing and setback requirements as shown on the approved plans. Interior side yard setbacks for all parcels in the District shall be no less than 7.5 feet.

C. The PUD provides for public streets to serve all development parcels in the District.

D. The PUD requires public sidewalks along all streets and further provides for public trails in specific locations in the District according to the approved plans.

E. Additional visitor parking for the 45-foot wide single family housing areas shall be as provided per the approved plans. The additional visitor parking that occurs as shown on the Final Plans shall be maintained, including snow removal and all other maintenance through the Meadows at Pioneer Park Homeowners Association, as it may be organized or named, regardless whether such visitor parking is located in whole or in part within public right of way. Such maintenance shall be consistent with City street maintenance standards and requirements.

F. The architectural plans are required to meet the standards, including building materials, as set forth in Table 1 of this Ordinance, and as approved with the Development Stage PUD, and which are incorporated into the City Council resolution Nos. _____.

G. The PUD may, at the discretion of the City, accommodate a reduced front yard setback, to a minimum of 25 feet from the front property line, provided the front garage wall is no more than 5 feet forward of the front-facing entry door.

H. Home styles shall consist exclusively of one- or two-story units, and split-entry home styles shall be prohibited.

I. Trash receptacles shall be stored within private garages. This requirement shall be a standard of the Homeowners Association with regard to ongoing enforcement.

J. The development shall be required to meet an "anti-monotony" standard, to be approved by the Community Development Department, designed to ensure that homes in close proximity vary in façade and/or general design, and color.

K. Landscaping shall be as per approved Final Stage PUD Development Plans, or as administratively approved per Monticello City Code.

L. The retaining walls that cross property lines shall be owned and maintained by the Homeowners Association, and shall expressly not be the responsibility of the City.

M. The location and widths of internal lot line drainage and utility easements are as per the approved plat of Meadows at Pioneer Park Plat or its successor plats.

(6) In such case where any proposed improvement is not addressed by the Final Stage PUD, then the applicant shall seek a PUD Amendment per

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the processes of the Monticello Zoning Ordinance and as directed by the Community Development Department.

(7) Where there are any conflicts in the allowed uses or required performance standards between the Meadows at Pioneer Park PUD District and any other applicable zoning regulations, the requirements of the Meadowbrook PUD District and its associated plans shall prevail.

(8) Amendments. Where changes to the PUD are proposed in the manner of use, density, site plan, development layout, building size, mass, or coverage, or any other change, the proposer shall apply for an amendment to the PUD under the terms of § 153.028(O)(10). The city may require that substantial changes in overall use of the PUD property be processed as a new project, including a zoning district amendment.

Section 2. The City Clerk is hereby directed to mark the official zoning map to reflect this ordinance. The map shall not be republished at this time.

Section 3. The City Clerk is hereby directed to make the changes required by this Ordinance as part of the Official Monticello City Code, Title XV, Zoning Ordinance, and to renumber the tables and chapters accordingly as necessary to provide the intended effect of this Ordinance. The City Clerk is further directed to make necessary corrections to any internal citations that result from said renumbering process, provided that such changes retain the purpose and intent of the Zoning Ordinance as has been adopted.

Section 4. This Ordinance shall take effect and be in full force from and after its passage and publication. The ordinance in its entirety and map shall be posted on the City website after publication. Copies of the complete Ordinance and map are available online and at Monticello City Hall for examination upon request.

ADOPTED BY the Monticello City Council this ____ day of _____, 2025.

_____
Lloyd Hilgart, Mayor

ATTEST:

_____
Rachael Leonard, City Administrator

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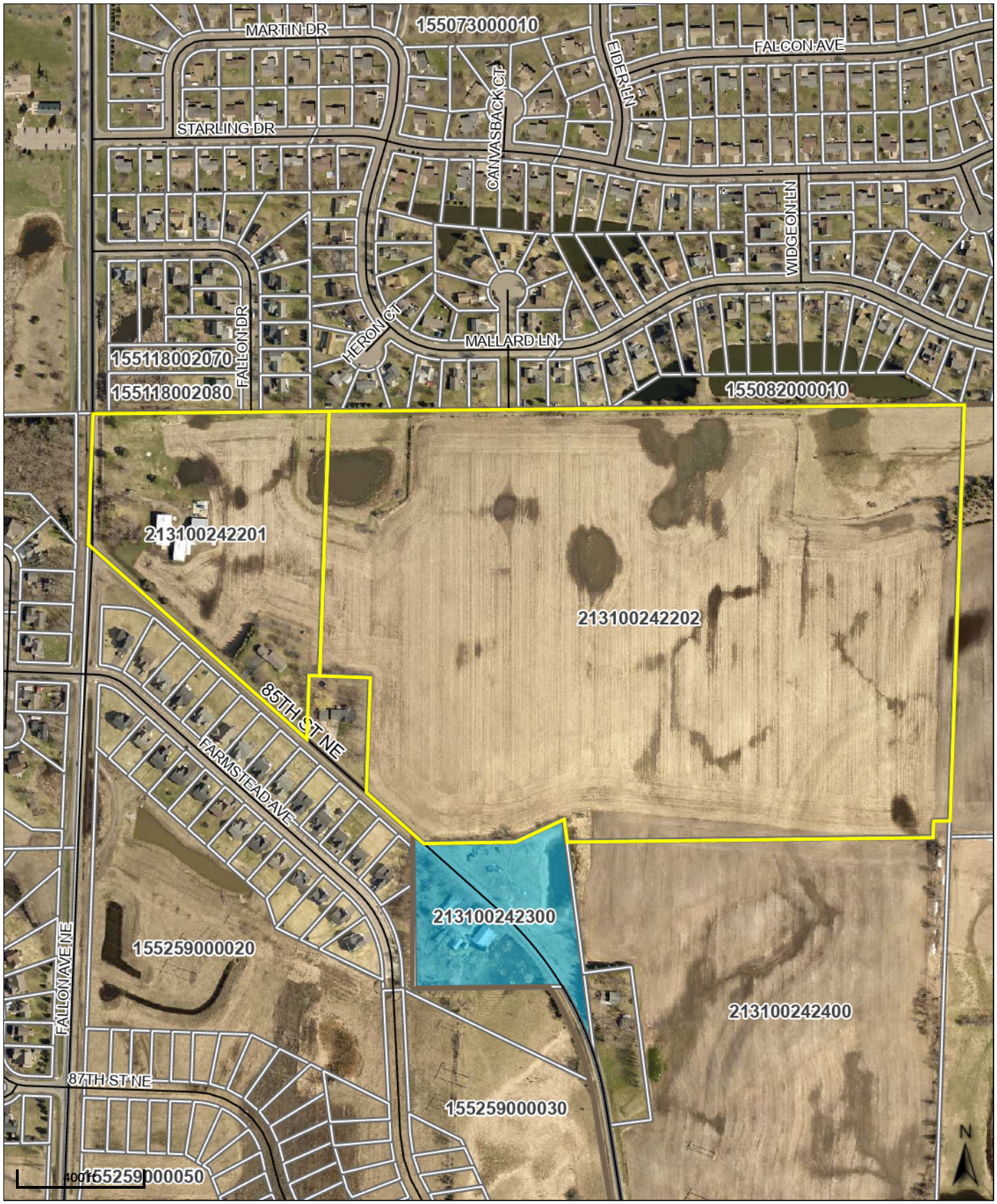
AYES:
NAYS:

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Consideration of Request for Prelim Plat of The Meadows at Pioneer Park

Legal Lengthy-Contact City Hall | PIDs 213-100-242201 & 213-100-242202 | 5106 85th St NE

Created by: City of Monticello



The Meadows at Pioneer Park

Tamarack Land Development is excited to build another great community to live, play and enjoy for many families in Monticello. The location is in the middle of a residential area of the City with many amenities needing this community including utilities, parks, shopping and roadways ready to make this a great place to call home for many. Located between Fallon Avenue and 85th Street NE, the site features 67 acres of land and is bordered by low density residential single-family neighborhoods on the north, west and south sides of the property, making this an ideal community to enhance the area.

Existing Site

Nestled in the farm fields of the Nelson Farm today, sits pockets of lowland natural wetland that provide both habitat and important ecological resources for stormwater. The design of neighborhood was created to protect these features and was carefully designed around them while also providing amenities to bring people and nature together. The existing homestead along with the existing outbuildings would be preserved in the proposed plan.

Proposed Site Design

As mentioned above, careful consideration was considered to protect the onsite wetlands when the design was laid out. Primary street ingress/egress connections are proposed off of 85th Street with two inner connection to the neighborhood to the north, one off of existing Fallon Drive and one off of Mallard Lane. These connections are critical to the safety network and interconnectivity of the area. Internal roadways are designed to meet City of Monticello standards for local roadways including dedicating 60-foot wide rights-of-way.

A trail connection is proposed from the existing trail network from 85th Street to the neighborhood of Cardinal Hills. The proposed development would also create inner connecting sidewalk networks internally.

Stormwater ponding is proposed strategically in areas that can sufficiently and effectively treat and store stormwater prior to discharging to local wetlands and offsite discharges. The proposed development ponding has been sized appropriately to meet all local and

state regulations. The ponds are proposed to become public after completion and acceptance.

Proposed Planned Unit Development (PUD)

The proposed PUD will provide the area with a variety of housing types with flexibility in lot sizes for different styles of homes. The proposed concept plan proposes two lot sizes, a 65-foot wide lot or "traditional lots" and a 45-foot wide "villa or detached townhome" lot. Flexibility in lot sizes is important for this development to a HOA maintained program and allowing a more affordable product that requires less maintenance for the homeowner. This multiple style housing withing the development requires flexibility to the standard zoning, thus the proposed PUD. Important public benefits for this development were considered when developing this plan.

1) **Flexibility within the lot sizes allows for the variety of house styles that would otherwise not be accommodated on larger traditional lots**. In order for a HOA maintained community, smaller lots are needed to accommodate the style of home proposed. The housing type proposed on the smaller 45'-wide lots are only conducive for lots with smaller maintenance areas. Additionally, to support the HOA, the number of units is important to help share the costs and promote an effective managed HOA. Smaller HOA's are not as effective and efficient to operate.

2) **Affordability.** The PUD with smaller lots not only creates a sustainable HOA community, but also reduces the operational costs, reducing the HOA fees. Smaller lots done correctly like the proposed plan, promotes more affordable housing but reducing the unnecessary costs of lot areas, smaller building footprints, etc.. that this style of home targets. The option for homeowners to choose a housing product that meets their needs, such as independent living without the maintenance requirements of traditional single family homes, smaller floor plans with one level living, oftentimes with slab on grade foundations that allow for a more accessible floor plan all while achieving a more affordable product.

3) **Preservation of natural resources.** As mentioned above, preservation of natural resources was important, the PUD allows for density to be achieved in areas outside of the critical habitat preserving these areas while still creating a neighborhood meeting density goals for the region.

4) **Trails and connectivity.** Public benefit serving residents outside of this neighborhood is the proposed trail connection between 85th and the existing neighborhood. This connection is important for connecting neighborhoods to Pioneer Park in a safe manor. The PUD flexibility, allowing for density to occur in areas that make sense, allows for this trail connection to be constructed on the west and north end of the development, where otherwise might be consumed with ponding and proposed lots.

Homeowners Association (HOA)

As part of the neighborhood and the proposed PUD, some common amenities within the neighborhood are being proposed that will be privately owned and maintained. To ensure long-term maintenance and upkeep, these amenities such as guest parking stalls and clustered mailboxes will be owned and maintained through a homeowner's association. This homeowner's association will include all the 45' wide lots within the neighborhood that will manage and oversee these private amenities.

Proposed Lot Standards

65' WIDE SINGLE FAMILY LOTS		
	T-N Base Standard	**Meadows at Pioneer Park**
Min. Lot Size	5,500 S.F.	8,775 S.F.
Lot Width	55'	65'
Lot Depth	100'	135'
Setbacks	Front: 25' Rear: 30' Interior Side: 10' Corner Side: 20'	Front: 30' Rear: 30' Interior Side: 7.5' Corner Side: 20'
Max. Height	2.5 Stories or 35'	
Min. Floor Area	1,050 S.F. Foundation 2,000 S.F. Finished Floor	934 S.F. Finished 1,700 S.F. Furnishable
Min. Garage Floor Area	480 S.F.	463 S.F.

Front Façade Requirements	20% Stone or Brick	15% Front facing façade shall have stone/brick. Or 10% in combination of board on batten, shakes, corbels, or other substantive façade features with a total exceeding 20% of the front façade.
Front Porch	For front-loaded attached garages, no portion of any garage space may be more than five feet closer to the street than the front building line of the principal use (including porch).	Usable front porches or similar features.
Landscaping	Four caliper inches of canopy trees, which must be no less than three caliper inches at DBH at time of planting, plus two ornamental trees. Trees may be planted in front or side yard. No less than one shrub per 20 square feet of front yard area. No less than one deciduous flower planting per 20 square feet of front yard area.	At least (1) 2.5” caliper tree in front yard.

45' WIDE SINGLE FAMILY LOTS		
	T-N Base Standard	**Meadows at Pioneer Park**
Min. Lot Size	5,500 S.F.	6,300 S.F.
Lot Width	55'	45'
Lot Depth	100'	135'
Setbacks	Front: 25' Rear: 30' Interior Side: 10' Corner Side: 20'	Front: 30' Rear: 30' Interior Side: 7.5' Corner Side: 20'
Max. Height	2.5 Stories or 35'	
Min. Floor Area	1,050 S.F. Foundation 2,000 S.F. Finished Floor	934 S.F. Finished 1,700 S.F. Furnishable
Min. Garage Floor Area	480 S.F.	392 S.F.
Front Façade Requirements	20% Stone or Brick	15% Front facing façade shall have stone/brick. Or 10% in combination of board on batten, shakes, corbels, or other substantive façade features with a total exceeding 20% of the front façade.
Front Porch	For front-loaded attached garages, no portion of any garage space may be more than five feet closer to the street than the front building line of the principal use (including porch).	Usable front porches or similar features.
Landscaping	Four caliper inches of canopy trees, which must be no less than three caliper inches at DBH at time of planting, plus two ornamental trees. Trees may be planted in front or side yard.	At least (1) 2.5" caliper tree in front yard.

	No less than one shrub per 20 square feet of front yard area. No less than one deciduous flower planting per 20 square feet of front yard area.	

Example Architectural Elevations. 45’ Wide Single-Family Lots.



Exterior A



Exterior B



Exterior C



Exterior D



Exterior E



Exterior F



Exterior B



Exterior C



Exterior D



Exterior E



Exterior F



Exterior A



Exterior B



Exterior C



Exterior D



Exterior E



Exterior A



Exterior B



Exterior C



Exterior D



Exterior E

Example Architectural Elevations. 65’ Wide Single-Family Lots.



Exterior A3



Exterior B3



Exterior C3



Exterior D3



Exterior A



Exterior B



Exterior C



Exterior D



Exterior A3



Exterior B3



Exterior C3



Exterior D3

Conclusion and Financial Statement

Tamarack is excited to bring another beautiful neighborhood to Monticello. The proposed plan includes 95 sixty-five-foot-wide single-family lots and 62 forty-five-foot-wide single-family lots along with the 1 existing to remain homestead for a total of 158 lots on approx. 59 developable acres or a net density of 2.69 units/acre. Our team of experienced land professionals are committed to building high quality residential neighborhoods in Minnesota and around the Country. Our team has financial backing and capital to build high quality neighborhoods on time and on budget and understand the requirements associated with these developments. Our team has decades of experience developing residential, multifamily and commercial lots, working with neighbors, City staff and contractors to ensure the project is constructed in compliance with the plans and specifications.

Developer:
Tamarack Land
712 Vista Blvd, Ste 303
Waconia, MN 55387
Contact: Reid Schulz
reid@tamarackland.com
612.817.9433

Engineer/Surveyor:
Bogart, Pederson & Associates
13076 1st Street
Becker, MN 55308
Contact: Chris Dahn
cdahn@bogart-pederson.com
701.630.0508

Proposed Lot Areas:

Block	Lot	Area (SF)	Area (Ac)
1	1	24,656.7	0.566
1	2	8,775.0	0.201
1	3	8,775.0	0.201
1	4	8,775.0	0.201
1	5	8,775.0	0.201
1	6	8,775.0	0.201
1	7	8,775.0	0.201
1	8	8,775.0	0.201
1	9	8,775.0	0.201
1	10	8,775.0	0.201
1	11	12,350.6	0.284
2	1	9,887.7	0.227
2	2	11,085.4	0.254
2	3	10,178.8	0.234
2	4	8,775.0	0.201
2	5	8,775.0	0.201
2	6	8,775.0	0.201
2	7	8,775.0	0.201
2	8	12,603.2	0.289
2	9	10,725.0	0.246
2	10	8,775.0	0.201
2	11	8,775.0	0.201
2	12	12,561.0	0.288
2	13	17,290.8	0.397
2	14	19,285.4	0.443
3	1	26,604.8	0.611
3	2	22,950.5	0.527
3	3	9,541.4	0.219
3	4	6,075.0	0.139
3	5	6,075.0	0.139
3	6	6,075.0	0.139
3	7	6,075.0	0.139
3	8	6,075.0	0.139
3	9	17,494.2	0.402
4	1	10,072.9	0.231
4	2	6,075.0	0.139
4	3	6,075.0	0.139
4	4	6,075.0	0.139
4	5	6,075.0	0.139
4	6	6,075.0	0.139
4	7	6,075.0	0.139
4	8	6,075.0	0.139
4	9	6,257.5	0.144
4	10	7,424.5	0.170
4	11	8,707.6	0.200
4	12	24,717.8	0.567
5	1	11,711.8	0.269
5	2	9,062.6	0.208
5	3	9,800.0	0.225
5	4	7,000.0	0.161
5	5	6,300.0	0.145
5	6	6,300.0	0.145
5	7	6,300.0	0.145
5	8	6,300.0	0.145
5	9	6,300.0	0.145
5	10	6,300.0	0.145
5	11	6,300.1	0.145
5	12	6,923.8	0.159
5	13	7,287.2	0.167
5	14	7,982.5	0.183
5	15	9,076.9	0.208
5	16	10,553.4	0.242
5	17	11,996.1	0.275
5	18	9,004.8	0.207
5	19	9,000.0	0.207
5	20	9,000.0	0.207
5	21	9,000.0	0.207
5	22	9,000.0	0.207
5	23	9,000.0	0.207
5	24	9,000.0	0.207
5	25	8,631.5	0.198
5	26	7,103.7	0.163
6	1	14,223.6	0.327
6	2	9,800.0	0.225
6	3	9,800.0	0.225
6	4	9,800.0	0.225
6	5	14,894.1	0.342
6	6	14,223.6	0.327
6	7	9,800.0	0.225
6	8	9,800.0	0.225
6	9	9,800.0	0.225
6	10	14,223.6	0.327

Block	Lot	Area (SF)	Area (Ac)
7	1	13,300.0	0.305
7	2	9,800.0	0.225
7	3	9,800.0	0.225
7	4	9,100.0	0.209
7	5	9,100.0	0.209
7	6	9,100.0	0.209
7	7	9,100.0	0.209
7	8	12,344.2	0.283
8	1	13,575.0	0.312
8	2	9,750.0	0.224
8	3	9,750.0	0.224
8	4	9,750.0	0.224
8	5	9,750.0	0.224
8	6	9,750.0	0.224
8	7	9,750.0	0.224
8	8	10,500.0	0.241
8	9	11,445.8	0.263
8	10	12,440.4	0.286
8	11	9,903.1	0.227
8	12	8,775.0	0.201
8	13	8,775.0	0.201
8	14	8,775.0	0.201
8	15	8,775.0	0.201
8	16	8,775.0	0.201
8	17	8,775.0	0.201
8	18	8,788.7	0.202
8	19	10,953.7	0.251
8	20	15,195.7	0.349
8	21	14,881.9	0.342
8	22	11,368.8	0.261
8	23	11,171.4	0.256
8	24	10,974.0	0.252
8	25	11,597.4	0.266
8	26	9,450.0	0.217
8	27	6,300.0	0.145
8	28	6,757.9	0.155
9	1	11,812.5	0.271
9	2	8,775.0	0.201
9	3	9,876.9	0.227
9	4	10,845.0	0.249
9	5	9,631.2	0.221
9	6	8,775.0	0.201
9	7	11,812.5	0.271
9	8	15,562.6	0.357
9	9	14,240.2	0.327
9	10	12,573.3	0.289
9	11	11,238.1	0.258
9	12	12,137.6	0.279
9	13	7,102.6	0.163
9	14	6,824.0	0.157
9	15	7,153.0	0.164
9	16	7,744.4	0.178
9	17	8,432.7	0.194
9	18	9,121.5	0.209
9	19	9,810.4	0.225
9	20	10,154.8	0.233
10	1	11,812.5	0.271
10	2	8,775.0	0.201
10	3	11,407.2	0.262
10	4	8,775.0	0.201
10	5	8,775.0	0.201
10	6	8,775.0	0.201
10	7	8,775.0	0.201
10	8	12,670.0	0.291
10	9	6,300.0	0.145
10	10	7,221.9	0.166
10	11	7,659.2	0.176
10	12	7,691.7	0.177
10	13	7,749.8	0.178
10	14	6,328.6	0.145
10	15	6,619.2	0.152
10	16	9,450.0	0.217
10	17	9,800.0	0.225
10	18	9,800.0	0.225
10	19	9,800.0	0.225
10	20	10,575.5	0.243

Developable Area Exhibit:



CITY OF MONTICELLO
WRIGHT COUNTY, MN

LOT AREAS																				
BLOCK	LOT	AREA	BLOCK	LOT	AREA	BLOCK	LOT	AREA	BLOCK	LOT	AREA	BLOCK	LOT	AREA	BLOCK	LOT	AREA	BLOCK	LOT	AREA
1	1	24657	3	1	26605	6	4	9750	7	1	17787	7	26	6300	8	9	9728	9	12	7659
1	2	8775	3	2	22950	6	5	9750	7	2	9800	7	27	6300	8	10	9040	9	13	7692
1	3	8775	3	3	12561	6	6	9750	7	3	9100	7	28	6924	8	11	8351	9	14	7750
1	4	8775	3	4	8775	6	7	9750	7	4	9100	7	29	7287	8	12	7662	9	15	6329
1	5	8775	3	5	8775	6	8	10500	7	5	9100	7	30	7982	8	13	8587	9	16	6619
1	6	8775	3	6	8775	6	9	11446	7	6	13162	7	31	9077	8	14	12138	9	17	9450
1	7	8775	4	1	12807	6	10	12440	7	7	11475	7	32	10553	8	15	7048	9	18	8024
1	8	8775	4	2	8775	6	11	9903	7	8	13163	7	33	11996	8	16	12212	9	19	6300
1	9	8775	4	3	8775	6	12	8775	7	9	6300	7	34	9005	8	17	7156	9	20	6300
1	10	8775	4	4	8775	6	13	8775	7	10	6300	7	35	9000	8	18	7744	9	21	6300
1	11	12351	4	5	8775	6	14	8775	7	11	6300	7	36	9000	8	19	8433	9	22	6300
2	1	9888	4	6	8775	6	15	8775	7	12	6300	7	37	9000	8	20	9122	9	23	6581
2	2	11085	4	7	12341	6	16	8775	7	13	6300	7	38	9000	8	21	9810	10	1	173038
2	3	10179	4	8	30683	6	17	8775	7	14	6300	7	39	9000	8	22	10155	OUTLOT A	–	102842
2	4	8775	5	1	13300	6	18	8789	7	15	7058	7	40	9000	9	1	11812	OUTLOT B	–	279881
2	5	8775	5	2	9800	6	19	10954	7	16	8195	7	41	8632	9	2	8775	OUTLOT C	–	190458
2	6	8775	5	3	9800	6	20	15196	7	17	9539	7	42	7104	9	3	11407	OUTLOT D	–	31757
2	7	8775	5	4	9100	6	21	14882	7	18	8296	8	1	11812	9	4	8775	OUTLOT E	–	18525
2	8	12140	5	5	9100	6	22	11369	7	19	8013	8	2	8775	9	5	8775	OUTLOT F	–	90661
2	9	10725	5	6	9100	6	23	11171	7	20	7000	8	3	9877	9	6	8775			
2	10	8775	5	7	9100	6	24	10974	7	21	6300	8	4	10845	9	7	8775			
2	11	8775	5	8	12344	6	25	11597	7	22	6300	8	5	9631	9	8	9450			
2	12	12561	6	1	13575	6	26	9450	7	23	6300	8	6	8775	9	9	6300			
2	13	17291	6	2	9750	6	27	6300	7	24	6300	8	7	11812	9	10	6300			
2	14	19285	6	3	9750	6	28	6758	7	25	6300	8	8	10073	9	11	7222			

Proposed Plat Description:

That part of the North Half of the Northwest Quarter of Section 24, Township 121, Range 25, Wright County, Minnesota lying northeasterly of the centerline of 85th Street Northeast (also known as Stokes Road) and its northwesterly extension to the west line of said Northwest Quarter.

EXCEPTING THEREFORM that part of the Northwest Quarter of Section 24, Township 121, Range 25, Wright County, Minnesota, described as follows: Commencing at the Northwest corner of said Northwest Quarter; thence South (assumed bearing), along the West line of said Northwest Quarter, a distance of 395.84 feet to the Northwesterly extension of the centerline of a Town Road; thence South 50 degrees 15 minutes 38 seconds East, along said Northwesterly extension and along said centerline, a distance of 1,167.88 feet; thence South 51 degrees 28 minutes 38 seconds East, along said centerline, a distance of 152.74 feet to the actual point of beginning; thence continue South 51 degrees 28 minutes 38 seconds East, along said centerline, a distance of 43.31 feet; thence North 87 degrees 09 minutes 19 seconds East, a distance of 277.17 feet; thence North 62 degrees 53 minutes 43 seconds East, a distance of 163.72 feet; thence South 9 degrees 31 minutes 50 seconds East, a distance of 738.43 feet to the centerline of the aforesaid town road; thence Northwesterly, along said centerline on a curve not tangent to the last described line concave Southwesterly having a radius of 1,019.29 feet and a central angle of 13 degrees 47 minutes 32 seconds a distance of 245.36 feet (the chord of said curve bears North 26 degrees 11 minutes 38 seconds West); thence South 87 degrees 16 minutes 21 seconds West, not tangent to said curve, a distance of 448.86 feet; thence North 2 degrees 43 minutes 39 seconds West, a distance of 469.12 feet to the point of beginning.

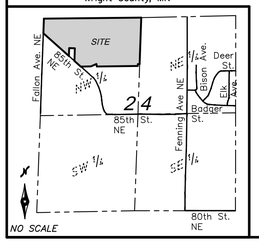
ALSO EXCEPTING: The South 50.00 feet of the East 50.00 feet of the Northeast Quarter of the Northwest Quarter of Section 24, Township 121, Range 25, Wright County, Minnesota.

ALSO EXCEPTING that part of the Northwest Quarter of the Northwest Quarter of Section 24, Township 121, Range 25, Wright County, Minnesota described as follows: Commencing at the Northeast corner of said Northwest Quarter of the Northwest Quarter; thence westerly along the North line thereof, a distance of 638.00 feet; thence southerly and parallel with the East line of said Northwest Quarter of the Northwest Quarter, a distance of 801.00 feet to the point of beginning; thence easterly, deflecting left 90 degrees 00 minutes 00 seconds, a distance of 186.00 feet; thence southerly, deflecting right 90 degrees 00 minutes 00 seconds, a distance of 347.75 feet to the centerline of 85th Street NE (also known as Stokes Road); thence northwesterly, deflecting right 129 degrees 39 minutes 27 seconds, a distance of 241.59 feet along said centerline to intersect a line drawn southerly and parallel with said East line of the Northwest Quarter of the Northwest Quarter from the point of beginning; thence northerly along said parallel line, a distance of 193.57 feet to the point of beginning.

Surveyor's Notes:

1. Contours were created by using a combination of ground based RTK GPS surveying, SUAS (small unmanned aerial system) survey and MN/DNR MN/Topo.
2. Subject property is NOT within a flood plain district as mapped by FEMA or part of the shoreland district.
3. A proceeding may be necessary to reconcile deed lines with found judicial landmarks along the southerly boundary of the subject property.
4. A substantial overhead powerline runs along the north line of the subject property. Only part of the powerline easement has been confined by a release of easement for the subject property.
5. A natural gas pipeline crosses the subject property. There are no current release of easement documents confining said pipeline.
6. Woods edge and part of the field edges were digitized per Wright County GIS 2021 aerial imaging and are for reference purposes only.
7. Reference 1973 survey for Arthur Bye by Meyer–Rohlin, Inc.; File No. S–73398.
8. Reference 1979 survey for Dennis Arnold by Meyer–Rohlin, Inc.; File No. S–79197.
9. Reference 2022 survey for Tamarack Land–Monticello by Bogart, Pederson & Associates, Inc.; File No. 21–0300.
10. Utilities shown per Gopher State One Call Ticket No.s: 220450840 & 220460018. Not all utilities may have been marked.
11. Braun Intertec completed a geotechnical exploration of the site. Reference report dated April 7th, 2022.

VICINITY MAP
Sec.24, Twp.121, Rng.25
Wright County, MN



SOILS CHART

Map symbol & soil name	Hydrologic group	Water table depth (in)
106C2: Lester loam, 6 to 10 percent slopes, moderately eroded	C	47"–63"
109: Cordova clay loam, 0 to 2 percent slopes	C/D	0"–8"
114: Glencoe clay loam, 0 to 1 percent slopes	C/D	0"–6"
945D2: Lester–Storden complex, 10 to 16 percent slopes, moderately eroded	C	55"–71"
1362B: Angus loam, 2 to 6 percent slopes	C	39"–51"

• Data from USDA Web Soil Survey

NOTE:
An official wetland delineation was performed by Kjolhaug Environmental Services Company, Inc. Reference the report dated September 30, 2021.

LEGEND:

- Denotes found 1/2 inch iron pipe 15233, unless otherwise noted
- Denotes set iron monument
- Denotes found 5/8 inch rebar 40361, unless otherwise noted
- Denotes found cast iron monument
- Denotes set nail
- Denotes Judicial Landmark (JLM) Set pursuant Torrens Case No. 85T
- Denotes catch basin
- Denotes beehive catchbasin
- Denotes electrical cabinet
- Denotes mailbox
- Denotes septic cleanout
- Denotes gas marker
- Denotes sanitary manhole
- Denotes watervalve
- Denotes water spigot
- Denotes sign
- Denotes power pole
- Denotes guy wire
- Denotes telephone pedestal
- Denotes cable television box
- Denotes fiber optic vault
- Denotes hydrant
- Denotes well
- Denotes air conditioning
- Denotes flared end section
- Denotes fiber optic marker

LS 15233
LS 21729
LS 40361
LS 47466

- Denotes shrub/bush
- Denotes tree, coniferous
- Denotes tree, deciduous
- Denotes delineated wetland interior
- Denotes soils classification type
- Denotes Dennis V. Taylor, LS
- Denotes Rick M. Blom, LS
- Denotes Thomas R. Balluff, LS
- Denotes Craig A. Wensmann, LS
- Denotes bituminous surface
- Denotes concrete surface
- Denotes gravel surface
- Denotes riprap surface
- Denotes chainlink fence
- Denotes barbwire fence
- Denotes overhead electric
- Denotes underground gas line
- Denotes tree line
- Denotes easement
- Denotes right of way
- Denotes sanitary sewer
- Denotes storm sewer
- Denotes waterline
- Denotes existing adjoiners
- Denotes delineated wetland edge
- Denotes waters edge
- Denotes underground fiber optics

Bearings are based on the Wright County Coordinate System (NAD83 86 Adj.). For the purpose of this survey, the East line of the Northwest Quarter of Section 24, Township 121, Range 25, Wright County, Minnesota, bears North 1 degree 58 minutes 19 seconds East.

REFERENCE BENCHMARK:
MNDOT Monument "8680 BX" at Interstate Highway 94 milepoint 195.05, 83.8 feet SSW of eastbound Interstate Highway 94 fog line, 39.5 feet SSW of the entrance ramp from County Road 18 to eastbound Interstate Highway 94.
Elevation = 965.20 feet (NAVD 88)

PROJECT BENCHMARK:
Top of railroad spike in north face of powerpole located in the SE quadrant at the intersection of 85th Street NE and Fallon Avenue NE.
Elevation = 960.92 feet (NAVD 88)

OWNER/DEVELOPER:
Tamarack Land Development, LLC
Dale Willenbring
1536 Beachcomber Blvd.
Waconia, MN 55386
763–234–0177

SURVEYORS & ENGINEERS:
Bogart, Pederson & Associates, Inc.
13076 First Street
Becker, MN 55308–9322
763–262–8822

TOTAL AREA: 67.46± Acres

EXISTING ZONING: T/A Transition Area

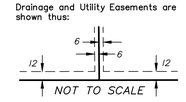
PROPOSED ZONING: P.U.D.

LOT MINIMUMS:
Single Family Lot: 8775 Sq. Ft.
65 feet width
135 feet depth

Villa Lot: 6300 Sq. Ft.
45 feet width
140 feet depth

BUILDING SETBACKS:
25' Corner Lot (side yard abutting street)
30' Front
15' Wetland Buffer Setback
30' Rear
10' Min. 50' Max Wetland Buffer
7.5' Side

Drainage and Utility Easements are shown thus:



Being 6 feet in width and adjoining lot lines and 12 feet in width and adjoining street lines as shown on this plat, unless otherwise shown.

DATE: 2/21/22
FIELD DATE: 4/15/22
BK/PG: 86.22/15
DRAWN BY: DJJ
CHECKED BY: CAW
DWG FILE: 21–0300.00prelimplat
FILE NO: 21–0300.00

REVISIONS:

I hereby certify that this survey, plan, or report was prepared by me or under my direct supervision and that I am a duly Licensed Land Surveyor under the laws of the State of Minnesota.

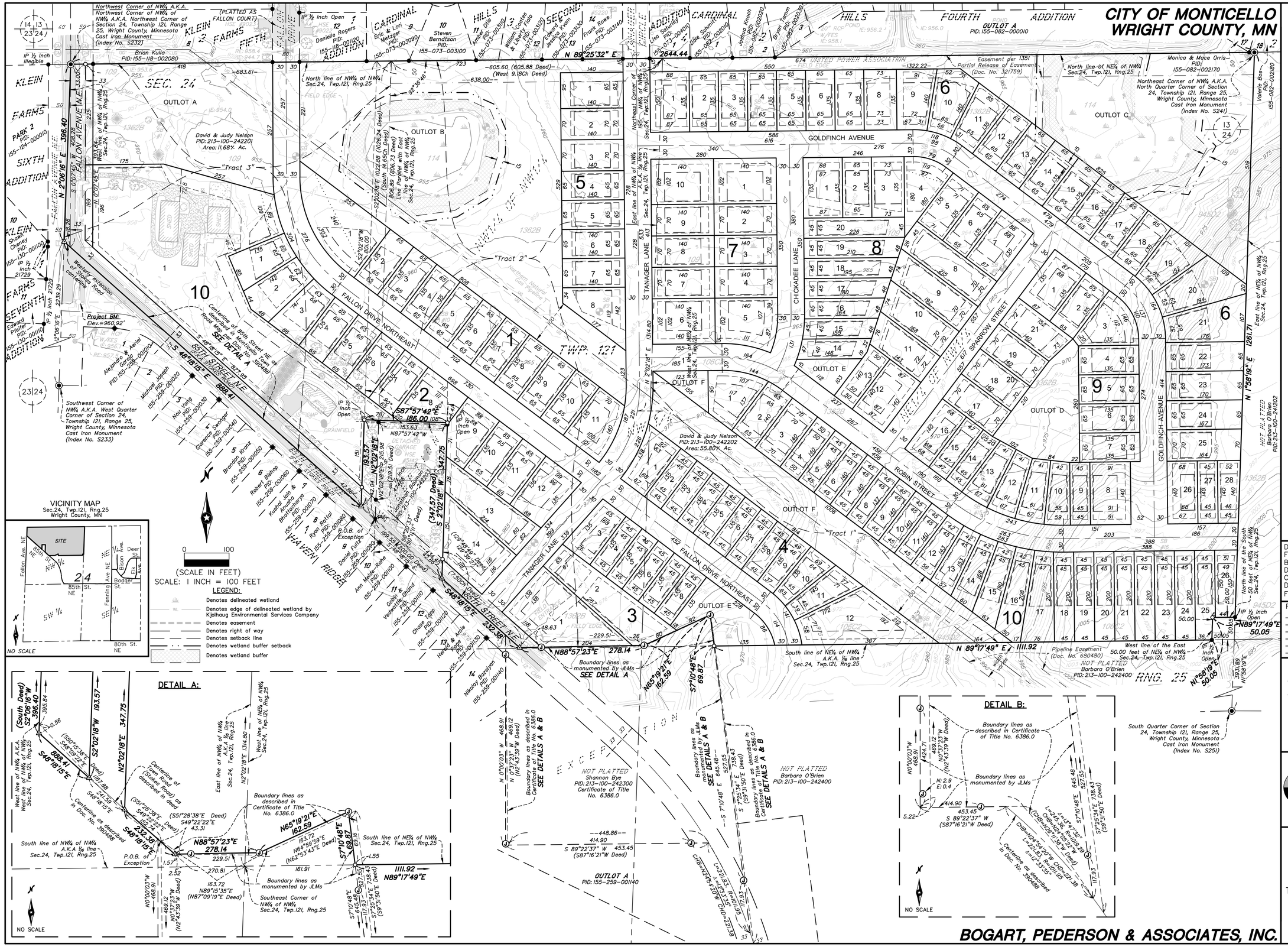
Signed: Craig Wensmann
Craig A. Wensmann
Date: 3/27/23 Lic. No. 47466

BOGART, PEDERSON & ASSOCIATES, INC.
LAND SURVEYING
CIVIL ENGINEERING
MAPPING
13076 FIRST STREET, BECKER, MN 55308–9322
TEL: 763–262–8822 FAX: 763–262–8844

PRELIMINARY PLAT
for
Tamarack Land Devt., LLC
TAMARACK LAND – MONTICELLO P.U.D.
City of Monticello
Wright County, MN

BOGART, PEDERSON & ASSOCIATES, INC.

CITY OF MONTICELLO
WRIGHT COUNTY, MN


Northwest Corner of NW¼ A.K.A. Northwest Corner of NW¼ of NW¼ A.K.A. Northwest Corner of Section 24, Township 121, Range 25, Wright County, Minnesota Cast Iron Monument (Index No. S232)
IP ½ Inch Illegible
IP ½ Inch Open
Southwest Corner of NW¼ A.K.A. West Quarter Corner of Section 24, Township 121, Range 25, Wright County, Minnesota Cast Iron Monument (Index No. S233)
Southeast Corner of NW¼ of NW¼ Sec.24, Twp.121, Rng.25
Quarter Corner of Section 24, Township 121, Range 25, Wright County, Minnesota Cast Iron Monument (Index No. S251)
Northeast Corner of NW¼ A.K.A. North Quarter Corner of Section 24, Township 121, Range 25, Wright County, Minnesota Cast Iron Monument (Index No. S241)
Project BM: Elev.=960.92'
N 89°25'32" E 2644.44
N 89°17'49" E 1111.92
N 1°58'19" E 1261.71
N 89°17'49" E 50.05
S 48°18'15" E 988.41
S 2°06'16" E 396.40
S 2°02'18" E 193.57
N 2°02'18" E 347.75
S 87°57'42" E 186.00
N 88°57'23" E 278.14
S 7°10'48" E 69.87
N 65°19'21" E 162.59
S 48°18'15" E 232.30
N 2°06'16" E 396.40
S 0°07'45" W 400.28
FALLON AVENUE NE
FALLON DRIVE NORTHEAST
FALLON DRIVE NE
85TH STREET NE
TANAGER LANE
CHICKADEE LANE
SPARROW STREET
ROBIN STREET
GOLDFINCH AVENUE
GOLDFINCH AVENUE NE
GOLDFINCH AVENUE NORTHEAST
OUTLOT A
OUTLOT B
OUTLOT C
OUTLOT D
OUTLOT E
OUTLOT F
"Tract 1"
"Tract 2"
"Tract 3"
SEC. 24
TWP. 121
RNG. 25
KLEIN FARMS FIFTH ADDITION
KLEIN FARMS SEVENTH ADDITION
KLEIN FARMS SIXTH ADDITION
KLEIN FARMS PARK 2
CARDINAL HILLS SECOND ADDITION
CARDINAL HILLS FOURTH ADDITION
(PLATTED AS FALLON COURT)
Brian Kulla PID: 155-118-002080
Danielle Rogers PID: 155-118-001120
Eric & Lori Metzger PID: 155-073-003090
Steven Berndtson PID: 155-073-003100
Amber Otte PID: 155-073-003110
William Coates & Sherry Palo PID: 155-073-003120
Edward & Jessica Kvam PID: 155-073-003130
Frank Rowe PID: 155-073-003140
Lisa Saturley PID: 155-073-004010
Dale Schmidt PID: 155-082-002010
Joshua Knoch PID: 155-082-002020
Bryan Lemm PID: 155-082-002030
Shawn Cheney PID: 155-130-001100
Edward Pfeifer PID: 155-130-001110
Alejandro & Aeriel Cardo PID: 155-259-000101
Michael Joseph PID: 155-259-001020
Nou Vang PID: 155-259-001030
Clarence Swonger PID: 155-259-001040
Brandon Kranz PID: 155-259-001050
Robert Bishop PID: 155-259-001060
Kuakou Jon & Bhattacharya PID: 155-259-001070
Ryan Rattai PID: 155-259-001080
Daniel Fuller PID: 155-259-001090
Ann Marie Rothe PID: 155-259-001100
Golgin Vesterfelt Grand PID: 155-259-001110
Chase Tapp PID: 155-259-001120
Herald Rose PID: 155-259-001130
Nikolay Borejvin PID: 155-259-001140
Valerie Bos PID: 155-082-002180
Monica & Mace Orris PID: 155-082-002170
David & Judy Nelson PID: 213-100-242201 Area: 11.68± Ac.
David & Judy Nelson PID: 213-100-242202 Area: 55.80± Ac.
Shannon Bye PID: 213-100-242300 Certificate of Title No. 6386.0
Barbara O'Brien PID: 213-100-242400
Jonathan Bourcy PID: 213-100-242203
Easement per 1351 Partial Release of Easement (Doc. No. 321759)
Pipeline Easement (Doc. No. 680480)
Northern Natural Gas Pipeline
Centerline of 85th Street NE as described in Doc. No. 390488
Centerline of Town Road (Stoken Road) as described in deed
Boundary lines as described in Certificate of Title No. 6386.0
Boundary lines as monumented by JLMs
SEE DETAIL A
SEE DETAIL B
SEE DETAILS A & B
P.O.B. of Exception
Westerly extension of Stoken Road centerline
Centerline of 85th Street NE as described in Doc. No. 390488
Boundary lines as monumented by JLMs
Southeast Corner of NW¼ of NW¼ Sec.24, Twp.121, Rng.25
South line of NW¼ of NW¼ A.K.A. ⅛ line Sec.24, Twp.121, Rng.25
South line of NE¼ of NW¼ Sec.24, Twp.121, Rng.25
East line of NW¼ of NW¼ A.K.A. ⅛ line Sec.24, Twp.121, Rng.25
West line of NE¼ of NW¼ Sec.24, Twp.121, Rng.25
West line of NW¼ A.K.A. West line of NW¼ of NW¼ Sec.24, Twp.121, Rng.25
North line of NW¼ of NW¼ Sec.24, Twp.121, Rng.25
East line of NW¼ of NW¼ Sec.24, Twp.121, Rng.25
West line of the East 50.00 feet of NE¼ of NW¼ Sec.24, Twp.121, Rng.25
North line of the South 50 feet of NE¼ of NW¼ Sec.24, Twp.121, Rng.25
East line of NE¼ of NW¼ Sec.24, Twp.121, Rng.25
Northeast Corner of NW¼ of NW¼ Sec.24, Twp.121, Rng.25
West line of NE¼ of NW¼ Sec.24, Twp.121, Rng.25
West line of the NE¼ of NW¼ Sec.24, Twp.121, Rng.25
West line of the NW¼ of NW¼ Sec.24, Twp.121, Rng.25
Northwesterly Right of Way line of Fallon Avenue NE
Northeasterly Right of Way line of Fallon Drive Northeast
Northeasterly Right of Way line of 85th Street NE
Northeasterly Right of Way line of Goldfinch Avenue
Northeasterly Right of Way line of Goldfinch Avenue NE
Northeasterly Right of Way line of Goldfinch Avenue Northeast
Northeasterly Right of Way line of Robin Street
Northeasterly Right of Way line of Sparrow Street
Northeasterly Right of Way line of Tanager Lane
Northeasterly Right of Way line of Chickadee Lane
Northeasterly Right of Way line of Fallon Drive Northeast
Northeasterly Right of Way line of Fallon Avenue NE
Northeasterly Right of Way line of Fallon Drive NE
Northeasterly Right of Way line of Fallon Drive Northeast
Northeasterly Right of Way line of 85th Street NE
Northeasterly Right of Way line of Tanager Lane
Northeasterly Right of Way line of Chickadee Lane
Northeasterly Right of Way line of Sparrow Street
Northeasterly Right of Way line of Robin Street
Northeasterly Right of Way line of Goldfinch Avenue
Northeasterly Right of Way line of Goldfinch Avenue NE
Northeasterly Right of Way line of Goldfinch Avenue Northeast

MEADOWS AT PIONEER PARK

P.U.D. RESIDENTIAL DEVELOPMENT

TAMARACK LAND - MONTICELLO, LLC

CITY OF MONTICELLO, WRIGHT COUNTY, MN

DECEMBER, 2024
PRELIMINARY PLANS

CIVIL & SURVEY PLANS PREPARED FOR:

TAMARACK LAND DEVELOPMENT

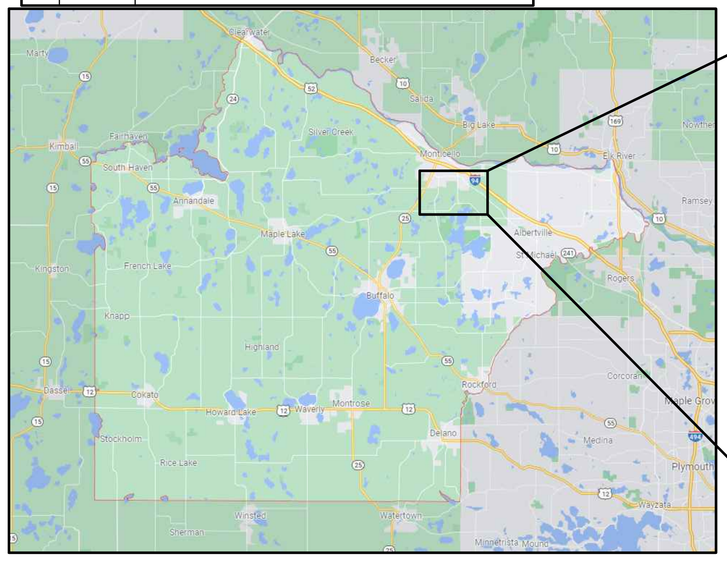
OWNER INFORMATION:
NAME: DAN WILLENBRING
TITLE: PARTNER
EMAIL: DAN@TAMARACKLAND.COM
CELL: 612-599-1219
WWW.TAMARACKLAND.COM

CIVIL & SURVEY PLANS PREPARED BY:

Bogart, Pederson & Associates, Inc.
CIVIL ENGINEERING
LAND SURVEYING
ENVIRONMENTAL SERVICES
Traditional Values · Creative Solutions

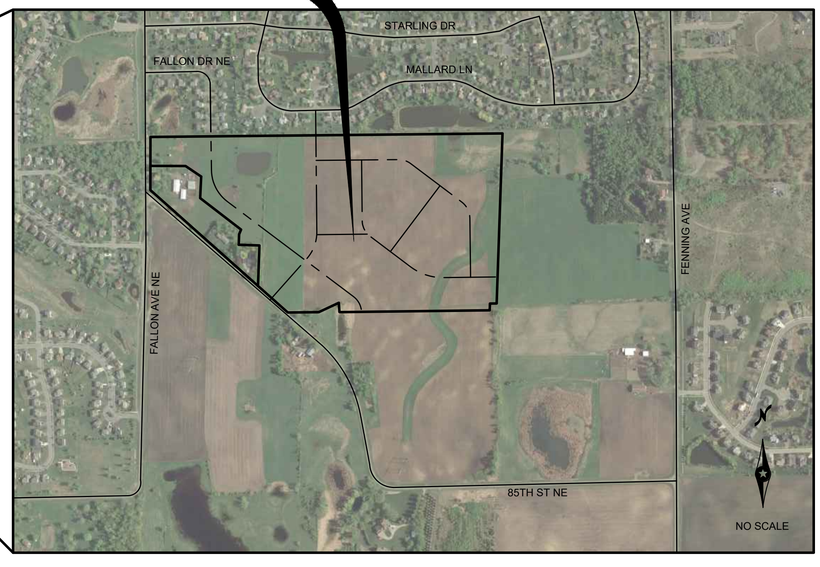
PROJECT ENGINEER INFORMATION:
NAME: CHRISTOPHER DAHN, PE
TITLE: STAFF ENGINEER
EMAIL: CDAHN@BOGART-PEDERSON.COM
PHONE: 763-270-6142

REV NO.	DATE	DESCRIPTION
-	09/07/2022	DRAWINGS ISSUED TO CITY
1	09/19/2022	REVISED PER PUD REVIEW
2	07/26/2024	UPDATED WITH NEW LAYOUT
3	12/11/2024	REVISED PER CITY COMMENTS



WRIGHT COUNTY, MINNESOTA

PROJECT LOCATION



VICINITY MAP

Sheet List Table	
Sheet Number	Sheet Title
C0	Cover
C1.0	Removals Plan
C2.0	Overall Site Plan
C2.1	NW Site Plan
C2.2	NE Site Plan
C2.3	SW Site Plan
C2.4	SE Site Plan
C2.5	Site Information
C2.6	Firetruck Turning Movement
C3.0	Overall Grading Plan
C3.1	NW Grading Plan
C3.2	NE Grading Plan
C3.3	SW Grading Plan
C3.4	SE Grading Plan
C4.0	Overall Utility Plan
C4.1	NW Utility Plan
C4.2	NE Utility Plan
C4.3	SW Utility Plan
C4.4	SE Utility Plan
C5.1	Street & Storm-Fallon Drive NE (1)
C5.2	Street & Storm-Fallon Drive NE (2)
C5.3	Street & Storm-Tanager Lane (1)
C5.4	Street & Storm-Tanager Lane (2)
C5.5	Street & Storm-Goldfinch Avenue (1)
C5.6	Street & Storm-Goldfinch (2)
C5.7	Street & Storm-Chickadee Lane
C5.8	Street & Storm-Robin Street
C5.9	Street & Storm-Robin Street (2)
C5.10	Street & Storm-Sparrow Street
C6.1	Water & Sani-Fallon Drive NE (1)
C6.2	Water & Sani-Fallon Drive NE (2)
C6.3	Water & Sani-Tanager Lane (1)
C6.4	Water & Sani-Tanager Lane (2)
C6.5	Water & Sani-Goldfinch Avenue (1)
C6.6	Water & Sani-Goldfinch Avenue (2)
C6.7	Water & Sani-Chickadee Lane
C6.8	Water & Sani-Robin Street
C6.9	Water & Sani-Robin Sani (2)
C6.10	Water & Sani-Sparrow Street
C7.0	Erosion Control Plan
C7.1	Wetland Buffer Seeding
C8.0	Overall Sign Plan
C8.1	NW Sign Plan
C8.2	NE Sign Plan
C8.3	SW Sign Plan
C8.4	SE Sign Plan
C8.5	Sight Line Exhibit
C9.0	SWPPP Narrative
C9.1	Details
C9.2	Details
C9.3	Details
C9.4	Details
C9.5	Details
C9.6	Details
C9.7	Details
C9.8	Details
C9.9	Details
C9.10	Details
C10.0	Lighting Overall Plan
C10.1	Lighting Plan
C10.2	Lighting Plan
C10.3	Lighting Plan
C10.4	Lighting Plan
T1	Tree Preservation Plan
L1	Landscape Plan

PRIVATE UTILITIES SHOWN ARE QUALITY LEVEL D.
QUALITY LEVEL D PROVIDES THE MOST BASIC LEVEL OF INFORMATION. IT INVOLVES COLLECTING DATA FROM EXISTING UTILITY RECORDS. RECORDS MAY INCLUDE AS-BUILT DRAWINGS, DISTRIBUTION AND SERVICES MAPS, EXISTING GEOGRAPHIC INFORMATION SYSTEM DATABASES, CONSTRUCTION PLANS, ETC.

n:\projects current\21-0300.00 tamarack monticello nelson\Civil\cad files\Cover\SWPPPDetails.dwg
10:31 AM
12/24/2024

LEGEND:

- REMOVE PAVEMENT SECTION (AS INDICATED).
- REMOVE EXISTING TREES (AS INDICATED)
- REMOVE FEATURE (AS INDICATED)
- SALVAGE (AS INDICATED)
- SAW-CUT

DEMOLITION GENERAL NOTES:

1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PERFORM OR COORDINATE ALL UTILITY CONNECTIONS AND RELOCATIONS FROM EXISTING UTILITY LOCATIONS TO THE PROPOSED BUILDING, AS WELL AS TO ALL ON-SITE AMENITIES. THESE CONNECTIONS INCLUDE BUT ARE NOT LIMITED TO WATER, SANITARY SEWER, UNDERGROUND GAS, ETC.
2. THE CONNECTIONS SHALL BE PERFORMED IN ACCORDANCE WITH STATE AND LOCAL STANDARD SPECIFICATIONS FOR CONSTRUCTION. UTILITY CONNECTIONS (UNDERGROUND GAS, WATERMAIN, AND STORM SEWER) MAY REQUIRE A PERMIT FROM THE CITY.
3. THE CONTRACTOR SHALL VERIFY THE ELEVATIONS AT PROPOSED CONNECTIONS TO EXISTING UTILITIES PRIOR TO ANY DEMOLITION.
4. CONTRACTOR SHALL COORDINATE WITH THE CITY OF MONTICELLO FOR ALL UTILITY DISCONNECTIONS, SERVICE TERMINATIONS AND REMOVALS. CONTRACTOR SHALL COORDINATE UTILITY DISCONNECTIONS AND RELOCATIONS WITH THE UTILITY PROVIDERS PRIOR TO THE START OF CONSTRUCTION. ALL SERVICE CONNECTIONS/DISCONNECTIONS SHALL BE PERFORMED IN ACCORDANCE WITH STATE AND LOCAL STANDARD SPECIFICATIONS FOR CONSTRUCTION. CONTRACTOR SHALL OBTAIN ALL NECESSARY STATE AND LOCAL PERMITS NECESSARY FOR UTILITY CONSTRUCTION AND WORK WITHIN ADJACENT RIGHT-OF-WAYS.
5. IF DEWATERING IS REQUIRED FOR THIS PROJECT, THE PUMP DISCHARGE SHALL BE TREATED PRIOR TO BEING DISCHARGED OFF-SITE OR INTO A SURFACE WATER. THE DISCHARGE SHALL BE VISUALLY CHECKED TO ENSURE THAT IT IS VISIBLY CLEAN WATER.
6. CONTRACTOR SHALL PROTECT UTILITIES, STRUCTURES AND TREES (NOTED AND NOT NOTED) TO REMAIN AND SHALL BE RESPONSIBLE TO REPAIR DAMAGES TO ANY FEATURES TO REMAIN.
7. TREES 6" AND LARGER AND OTHER NOTABLE VEGETATION WERE IDENTIFIED AND LOCATED DURING THE COURSE OF THE SURVEY. CONTRACTOR SHALL FIELD VERIFY THE EXISTING CONDITIONS OF THE PROJECT AREA AND REMOVE ALL TREES NOT DESIGNATED TO BE SAVED AND PROTECTED. ALL TREES, DEBRIS, ROOTS, BOULDERS AND TOPSOIL SHALL BE REMOVED FROM THE SITE.



0 100'

SCALE: 1" = 100'

CALL 48 HOURS BEFORE DIGGING:
GOPHER STATE ONE CALL
TWIN CITY AREA 651-454-0002
MINNESOTA TOLL FREE 1-800-252-1166

REV NO.	DATE	DESCRIPTION
-	09/07/2022	DRAWINGS ISSUED TO CITY
1	09/19/2022	REVISED PER PUD REVIEW
2	07/26/2024	UPDATED WITH NEW LAYOUT
3	12/11/2024	REVISED PER CITY COMMENTS

DATE: 12/11/2024
DESIGN BY: MJM
DRAWN BY: MJM
CHECKED BY: CJD
DWG FILE: DEMOLITION
FILE NO.: 21-0300.00

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.

Signed: _____ Lic. No. _____

Date: _____

BOGART, PEDERSON & ASSOCIATES, INC.
LAND SURVEYING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES
13179 FIRST STREET, BECKER, MN 55308-9322
TEL 763-262-9822 FAX 763-262-9844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

REMOVALS PLAN

SHEET NO.
C1.0

12/24/2024 10:32 AM n:\projects current\21-0300.00 tamarack monticello nelson\Civil\cad files\Demolition.dwg

N

0 100'

SCALE: 1" = 100'

NUMBER OF HOUSES

LOT AMOUNT	
SINGLE FAMILY HOMES:	95
VILLA HOMES:	62

REV NO.	DATE	DESCRIPTION
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DATE: 12/11/2024
DESIGN BY: MJM
DRAWN BY: MJM
CHECKED BY: CJD
DWG FILE: SITE BASE
FILE NO.: 21-0300.00

BOGART, PEDERSON & ASSOCIATES, INC.
LAND SURVEYING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES
13076 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-9082 FAX: 763-262-9844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

OVERALL SITE PLAN

SHEET NO.

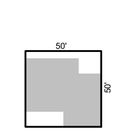
C2.0

CALL 48 HOURS BEFORE DIGGING:
GOPHER STATE ONE CALL
TWIN CITY AREA 651-454-0002
MINNESOTA TOLL FREE 1-800-252-1166

12/24/2024 10:32 AM n:\projects current\21-0300.00 tamarack monticello nelson\Civil\cad files\Site Plan.dwg

LEGEND:

- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- APPLIED WETLAND BUFFER
- CONCRETE CURB AND GUTTER - MODIFIED D
- HW — HIGH WATER PROPOSED SIGN



SINGLE FAMILY HOME — VILLA HOME

SITE PLAN NOTES:

1. ALL OTHER DIMENSIONS ARE SHOWN TO BACK OF CURB.
2. ALL CONCRETE RAMPS, SIDEWALKS AND ACCESSIBLE HANDICAPPED PARKING STALLS TO CONFORM TO CURRENT A.D.A. REQUIREMENTS.
3. CONTRACTOR SHALL FIELD VERIFY HORIZONTAL AND VERTICAL LOCATION OF EXISTING UTILITIES PRIOR TO START OF CONSTRUCTION.
4. CONTRACTOR SHALL INSTALL EROSION CONTROL MEASURES PRIOR TO THE START OF CONSTRUCTION.
5. CONSTRUCTION SHALL BE IN ACCORDANCE WITH APPLICABLE CITY, COUNTY AND STATE REGULATIONS.
6. SITE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PLANS APPROVED BY THE CITY.
7. LANDSCAPING AND TURF ESTABLISHMENT PER LANDSCAPE PLANS & SPECIFICATIONS.

NUMBER OF HOUSES

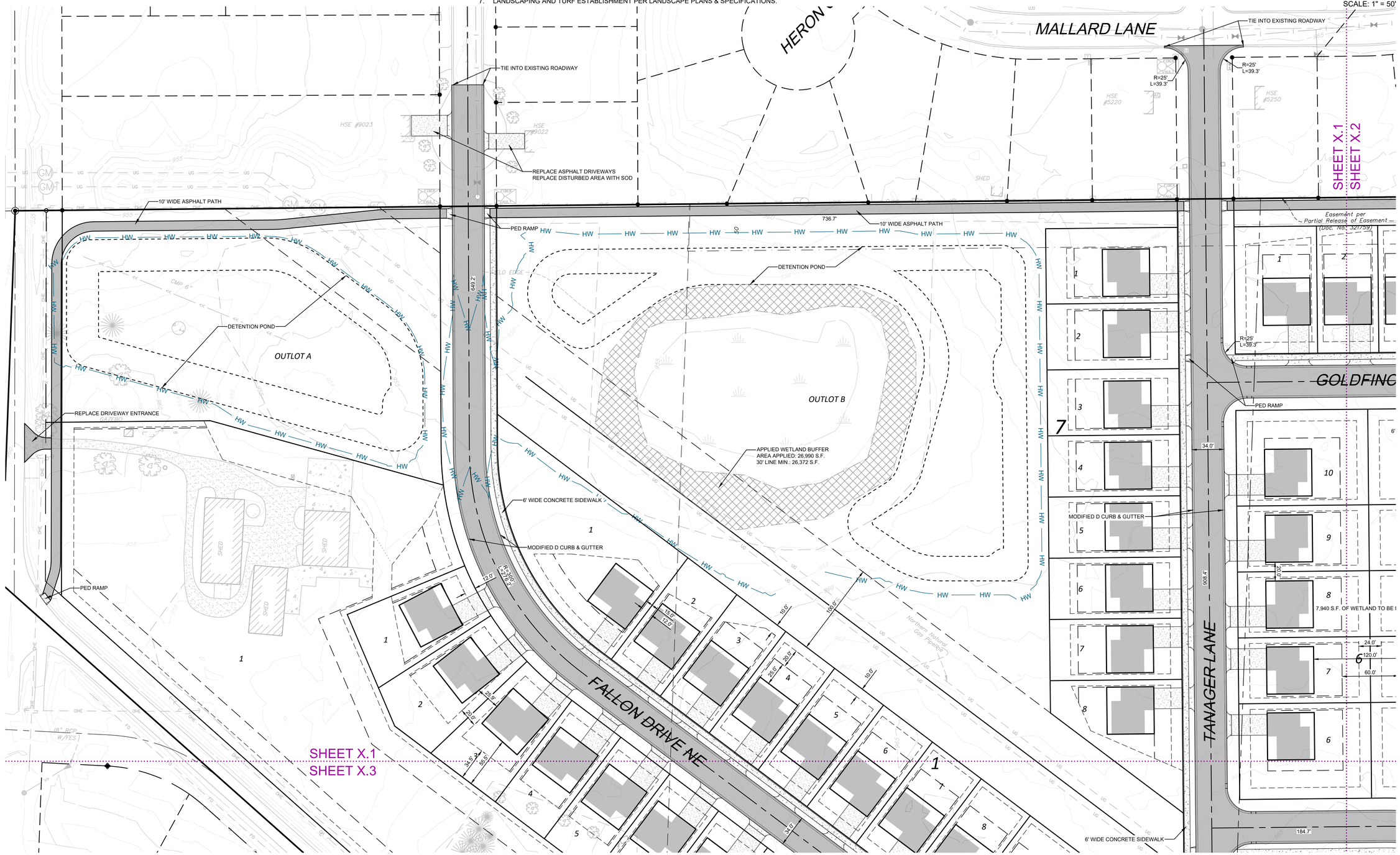
LOT AMOUNT

SINGLE FAMILY HOMES:	95
VILLA HOMES:	62

N

0 50'

SCALE: 1" = 50'



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DESIGN BY: MJM
DRAWN BY: MJM
CHECKED BY: CJD
DWG FILE: SITE BASE
FILE NO.: 21-0300.00

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13076 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-9822 FAX: 763-262-9844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

NW SITE PLAN

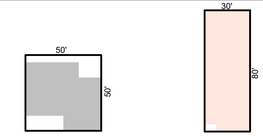
SHEET NO.

C2.1

12/4/2024 10:32 AM n:\projects current\21-0300.00\tamarack monticello nelson\Civil\cad files\Site Plan.dwg

LEGEND:

- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- CONCRETE CURB AND GUTTER - MODIFIED D
- PROPOSED SIGN



SITE PLAN NOTES:

1. ALL OTHER DIMENSIONS ARE SHOWN TO BACK OF CURB.
2. ALL CONCRETE RAMPS, SIDEWALKS AND ACCESSIBLE HANDICAPPED PARKING STALLS TO CONFORM TO CURRENT A.D.A. REQUIREMENTS.
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NUMBER OF HOUSES

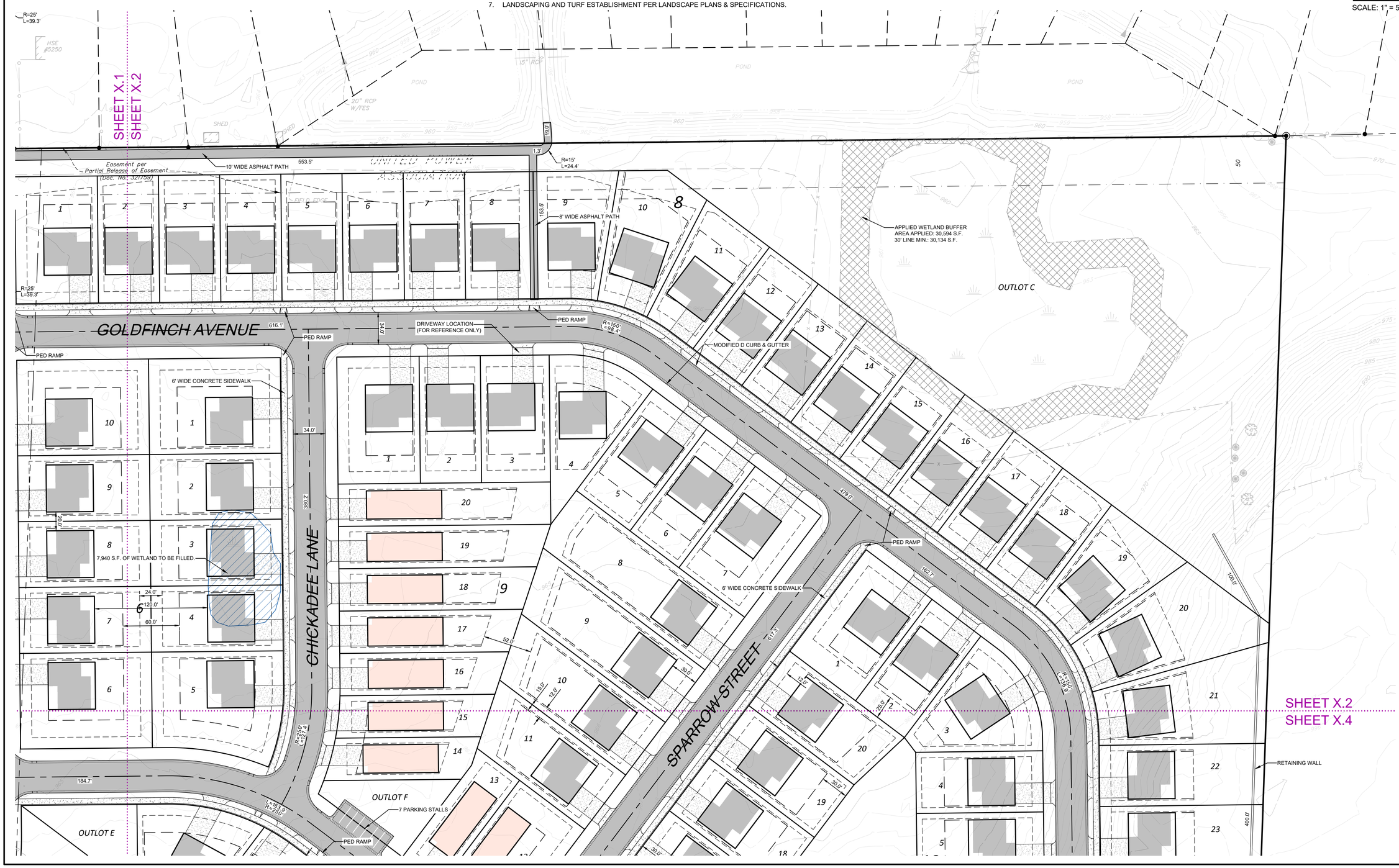
LOT AMOUNT

SINGLE FAMILY HOMES:	94
VILLA HOMES:	68

N

0 50'

SCALE: 1" = 50'



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DRAWN BY: MJM
CHECKED BY: CJD
DWG FILE: SITE BASE
FILE NO.: 21-0300.00

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Date: _____

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LAND SURVEYING
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13076 FIRST STREET BECKER, MN 55308-9322
TEL: 763-262-9822 FAX: 763-262-9844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

NE SITE PLAN

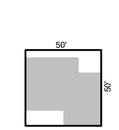
SHEET NO.

C2.2

12/24/2024 10:33 AM n:\projects current\21-0300.00 tamarack monticello nelson\Civil\xref files\Site Plan.dwg

LEGEND:

- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- CONCRETE CURB AND GUTTER - MODIFIED D
- PROPOSED SIGN



SITE PLAN NOTES:

1. ALL OTHER DIMENSIONS ARE SHOWN TO BACK OF CURB.
2. ALL CONCRETE RAMPS, SIDEWALKS AND ACCESSIBLE HANDICAPPED PARKING STALLS TO CONFORM TO CURRENT A.D.A. REQUIREMENTS.
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NUMBER OF HOUSES

LOT AMOUNT

SINGLE FAMILY HOMES:	94
VILLA HOMES:	68

N

0 50'

SCALE: 1" = 50'

SHEET X.1
SHEET X.3

FALLON DRIVE NE

TANAGER LANE

85th St NE

6' WIDE CONCRETE SIDEWALK

DRIVEWAY LOCATION (FOR REFERENCE ONLY)

PED RAMP

7 PARKING STALLS

TEMPORARY CUL-DE-SAC

OUTLOT E

OUTLOT G

FIELD ENTRANCE

FIELD EDGE

DETACHED GARAGE

EXTENTS OF DRAINFIELD UNKNOWN

SHEET X.3
SHEET X.4

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CHECKED BY: CJD
DWG FILE: SITE BASE
FILE NO.: 21-0300.00

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Signed: _____ Lic. No. _____

Date: _____

BOGART, PEDERSON & ASSOCIATES, INC.

LAND SURVEYING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES
12079 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-9622 FAX: 763-262-9644

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

SW SITE PLAN

SHEET NO.

C2.3

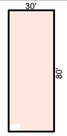
12/24/2024 10:33 AM n:\projects current\21-0300.00 tamarack monticello nelson\Civil\cad files\Site Plan.dwg

LEGEND:

- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- CONCRETE CURB AND GUTTER - MODIFIED D
- PROPOSED SIGN



SINGLE FAMILY HOME



VILLA HOME

SITE PLAN NOTES:

1. ALL OTHER DIMENSIONS ARE SHOWN TO BACK OF CURB.
2. ALL CONCRETE RAMPS, SIDEWALKS AND ACCESSIBLE HANDICAPPED PARKING STALLS TO CONFORM TO CURRENT A.D.A. REQUIREMENTS.
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NUMBER OF HOUSES

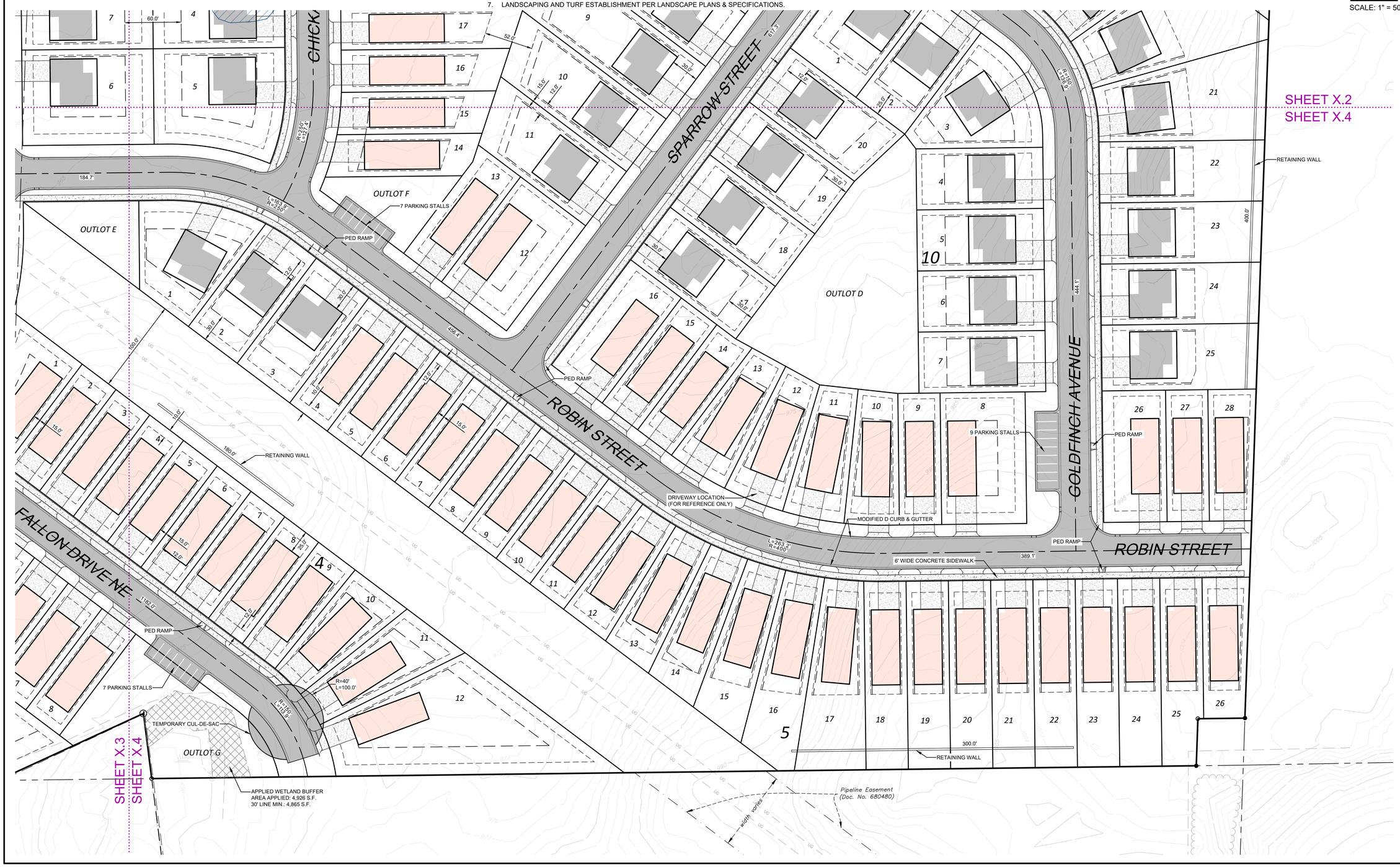
LOT AMOUNT

SINGLE FAMILY HOMES:	94
VILLA HOMES:	68

N

0 50'

SCALE: 1" = 50'



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DRAWN BY: MJM
CHECKED BY: CJD
DWG FILE: SITE BASE
FILE NO.: 21-0300.00

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Signed: _____ Lic. No. _____

Date: _____

BOGART, PEDERSON & ASSOCIATES, INC.
LAND SURVEYING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES
13979 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-9622 FAX: 763-262-9644

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

SE SITE PLAN

SHEET NO.

C2.4

12/24/2024 10:33 AM n:\projects current\21-0300.00 tamarack monticello nelson\Civil\set files\Site Plan.dwg

Impervious Calculations	Area (SF)	Area (Acres)
Existing Houses/Driveway	33376	0.77
Road	291126	6.68
Sidewalk/Trail	42783	0.98
Villas (62)	148800	3.42
Single Family Houses (95)	237500	5.45
Driveways	142965	3.28
Wetland	94690	2.17
Wetland Buffer	116036	2.66
Grass/Other Pervious	1831574	42.05
Total	2938850	67.47

EXISTING ZONING: AGRICULTURAL

PROPOSED ZONING: P.U.D.

LOT MINIMUMS:
- Single Family Lot: 8775 Sq. Ft.
- 65 feet width
- 135 feet depth

- Villa Lot: 6300 Sq. Ft.
- 45 feet width
- 140 feet depth

BUILDING SETBACKS:
- 25' Corner Lot (side yard abutting street)
- 30' Front
- 15' Wetland Buffer Setback
- 30' Rear
- 10' Min. 50' Max Wetland Buffer
- 7.5' Side

Drainage and Utility Easements are shown thus:



Being 6 feet in width and adjoining lot lines and 12 feet in width and adjoining street lines as shown on this plat, unless otherwise shown.

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CHECKED BY: CJD
DWG FILE: DETAILS
FILE NO.: 21-0300.00

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ENVIRONMENTAL SERVICES
13076 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-9822 FAX: 763-262-9844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

SITE INFORMATION

SHEET NO.

C2.5

12/4/2024 10:33 AM n:\projects current\21-0300.00 tamarack monticello nelson\Civil\cad files\Cover\SWPPP\details.dwg

LEGEND:

Pumper Fire Truck — 40' LONG PUMPER FIRE TRUCK

0 100'

SCALE: 1" = 100'

FALLON DRIVE NE
HERON COURT
TANAGER CIRCLE
MALLARD LANE
GOLDFINCH AVENUE
CHICKADEE LANE
SPARROW STREET
ROBIN STREET
COLBY NIGHTAVENUE
TANAGER LANE
85th ST NE
OUTLOT A
OUTLOT B
OUTLOT C
OUTLOT D
OUTLOT E
OUTLOT F
OUTLOT G
SHEET X.1
SHEET X.2
SHEET X.3
SHEET X.4
Drainage & Utility Easement (Doc. No. 321759)
Partial Release of Easement (Doc. No. 321759)
Fipeline Easement (Doc. No. 680480)
width varies
20" RCP W/FES
UNDEVELOPED AGRICULTURE
POND
SHED
DETACHED GARAGE
EXTENTS OF RAINFIELD UNKNOWN
FIELD ENTRANCE
FENCE
HW
UC
OHP
CMP

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DWG FILE: VEHICLE TURN
FILE NO.: 21-0300.00

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13076 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-9082 FAX: 763-262-9044

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

FIRETRUCK TURNING MOVEMENT

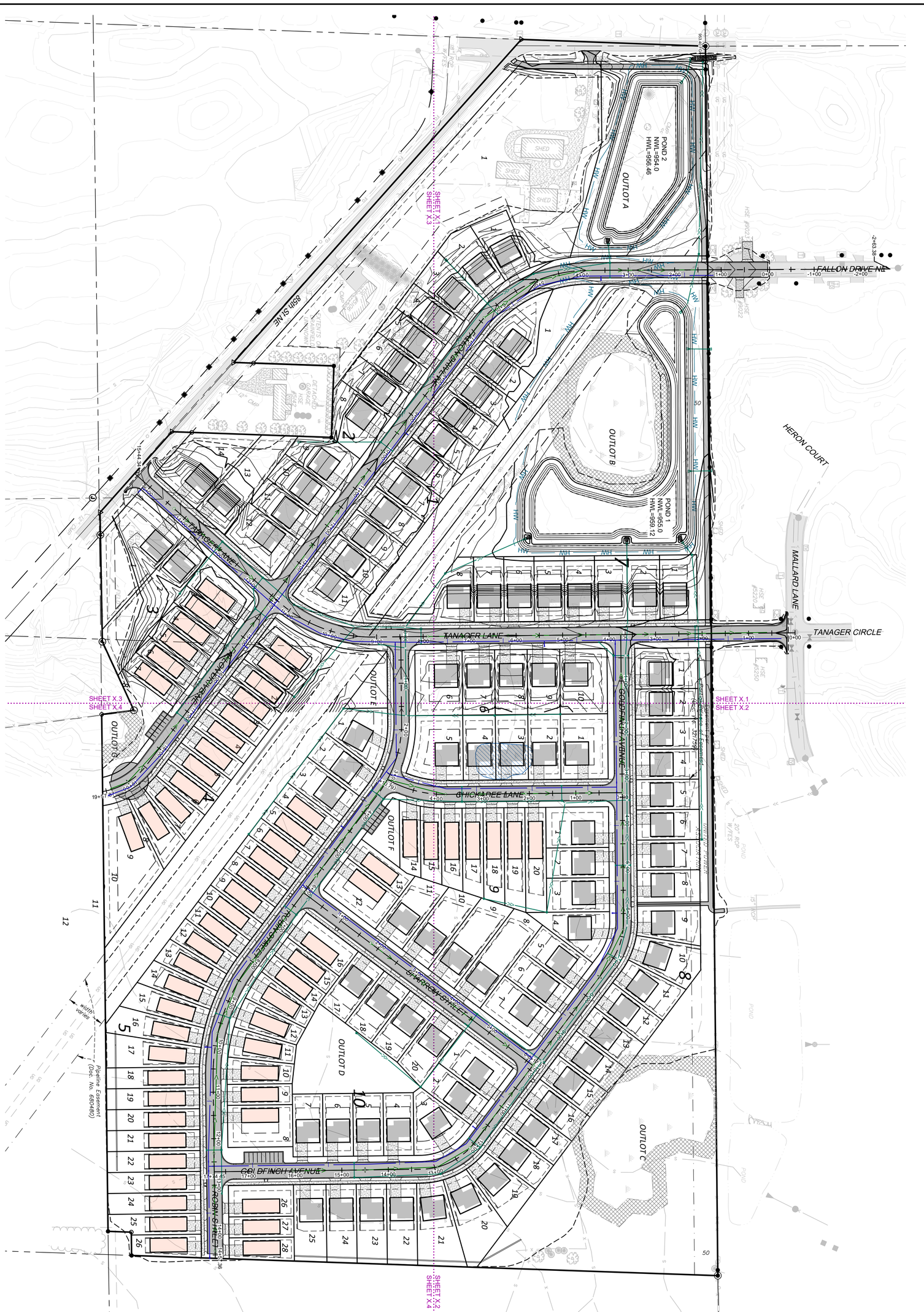
SHEET NO.

C2.6

CALL 48 HOURS BEFORE DIGGING:
GOPHER STATE ONE CALL
TWIN CITY AREA 651-454-0002
MINNESOTA TOLL FREE 1-800-252-1166

12/24/2024 10:34 AM n:\projects current\21-0300.00 tamarack monticello nelson\Civil\cad files\Fire Movement.dwg

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SCALE: 1" = 100'

SHEET NO.	C3.0
	MEADOWS AT PIONEER PARK TAMARACK LAND - MONTICELLO, LLC City of Monticello, Wright County, MN
	OVERALL GRADING PLAN

BOGART, PEDERSON & ASSOCIATES, INC.
LAND SURVEYING
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ENVIRONMENTAL SERVICES
13076 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-8822 FAX: 763-262-8844

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Signed:_____

Date:_____ Lic. No.

DATE:	12/11/2024
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DRAWN BY:	MJM
CHECKED BY:	CJD
DWG FILE:	GRADING
FILE NO.:	21-0300.00

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LEGEND:

	PROPOSED RIP RAP
980.50 TC	NEW TOP-BACK OF CURB ELEVATION
980.50 FL	NEW FLOW LINE OF CURB ELEVATION
980.50 SW	NEW SIDEWALK ELEVATION
980.50 TP	NEW TOP OF PAVEMENT ELEVATION
980.50 TG	NEW TOP OF GRAVEL ELEVATION
980.50 FG	NEW FINISHED GRADE ELEVATION
980.50 EX	EXISTING ELEVATION
984	PROPOSED CONTOUR
	PROPOSED SLOPE
E.O.F.	EMERGENCY OVERFLOW

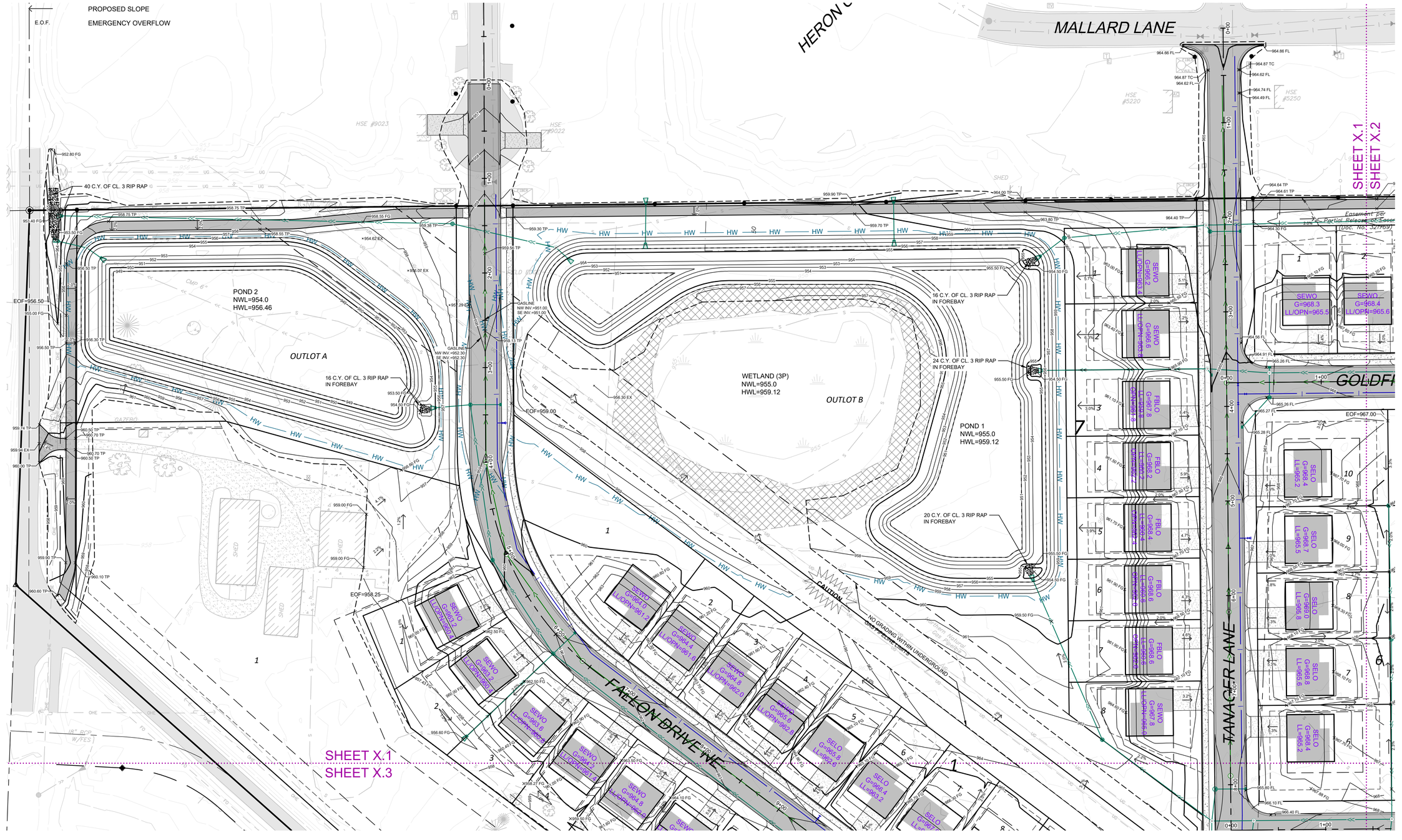
GRADING GENERAL NOTES:

1. THE CONTRACTOR SHALL NOTE ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS IN THE FIELD REPRESENTED WITHIN THE PLANS AS SHOWN AND ALERT THE ENGINEER BEFORE BIDDING THE PROJECT AND BEGINNING CONSTRUCTION.
2. CONTRACTOR SHALL LOCATE AND VERIFY ALL UTILITIES WHICH MAY AFFECT THIS WORK AND NOTIFY THE OWNER OF ANY CHANGES. CONTACT LOCAL UTILITY COMPANIES FOR EXACT LOCATIONS PRIOR TO BIDDING THE PROJECT AND COMMENCING WORK.
3. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT SILT AND DEBRIS RUN-OFF DURING GRADING OPERATIONS (I.E. SILT FENCE, STRAW BALES, ETC.).
4. CONTRACTOR SHALL VERIFY CRITICAL ELEVATIONS TO ENSURE CONFORMANCE WITH GRADING PLAN, PARTICULARLY WITH EXISTING STRUCTURES AND/OR PAVEMENTS TO REMAIN. MEET EXISTING GRADES ALONG STREETS, PROPERTY LINES, AND DRIVEWAY ENTRANCES. RESTORE ALL PAVEMENTS THAT REMAIN TO THEIR ORIGINAL IF NOT BETTER CONDITION. NOTIFY OWNER OF ANY CONFLICTS PRIOR TO BIDDING THE PROJECT.
5. TURF ESTABLISHMENT AREAS SHALL RECEIVE MINIMUM OF 4" DEPTH AS MEASURED IN PLACE OF TOPSOIL. TOPSOIL WILL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. ALL GRADED SLOPES GREATER THAN OR EQUAL TO 5:1 SHALL BE HYDROSEEDED, EROSION CONTROL BLANKETED, OR MULCHED TO HELP STABILIZE THE SLOPES BY GENERAL CONTRACTOR.
6. PROPOSED SPOT ELEVATIONS ARE TO THE TOP OF CURB UNLESS NOTED OTHERWISE. ELEVATION OF FLOW LINE IS 6" BELOW TOP OF CURB UNLESS OTHERWISE SHOWN.

N

0 50'

SCALE: 1" = 50'



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DWG FILE: GRADING
FILE NO.: 21-0300.00

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LAND SURVEYING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES
180 7TH FIRST ST NEFF L. BECKER, MN 55308-9322
TEL: 763-262-9822 FAX: 763-262-9844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

NW GRADING PLAN

SHEET NO.

C3.1

12/24/2024 10:37 AM n:\projects\ sumvol21-v3\300.00 tamarack monticello nelson\Civil\cad files\Grading Plan.dwg

LEGEND:

	PROPOSED RIP RAP
980.50 TC	NEW TOP-BACK OF CURB ELEVATION
980.50 FL	NEW FLOW LINE OF CURB ELEVATION
980.50 SW	NEW SIDEWALK ELEVATION
980.50 TP	NEW TOP OF PAVEMENT ELEVATION
980.50 TG	NEW TOP OF GRAVEL ELEVATION
980.50 FG	NEW FINISHED GRADE ELEVATION
980.50 EX	EXISTING ELEVATION
984	PROPOSED CONTOUR
	PROPOSED SLOPE
E.O.F.	EMERGENCY OVERFLOW

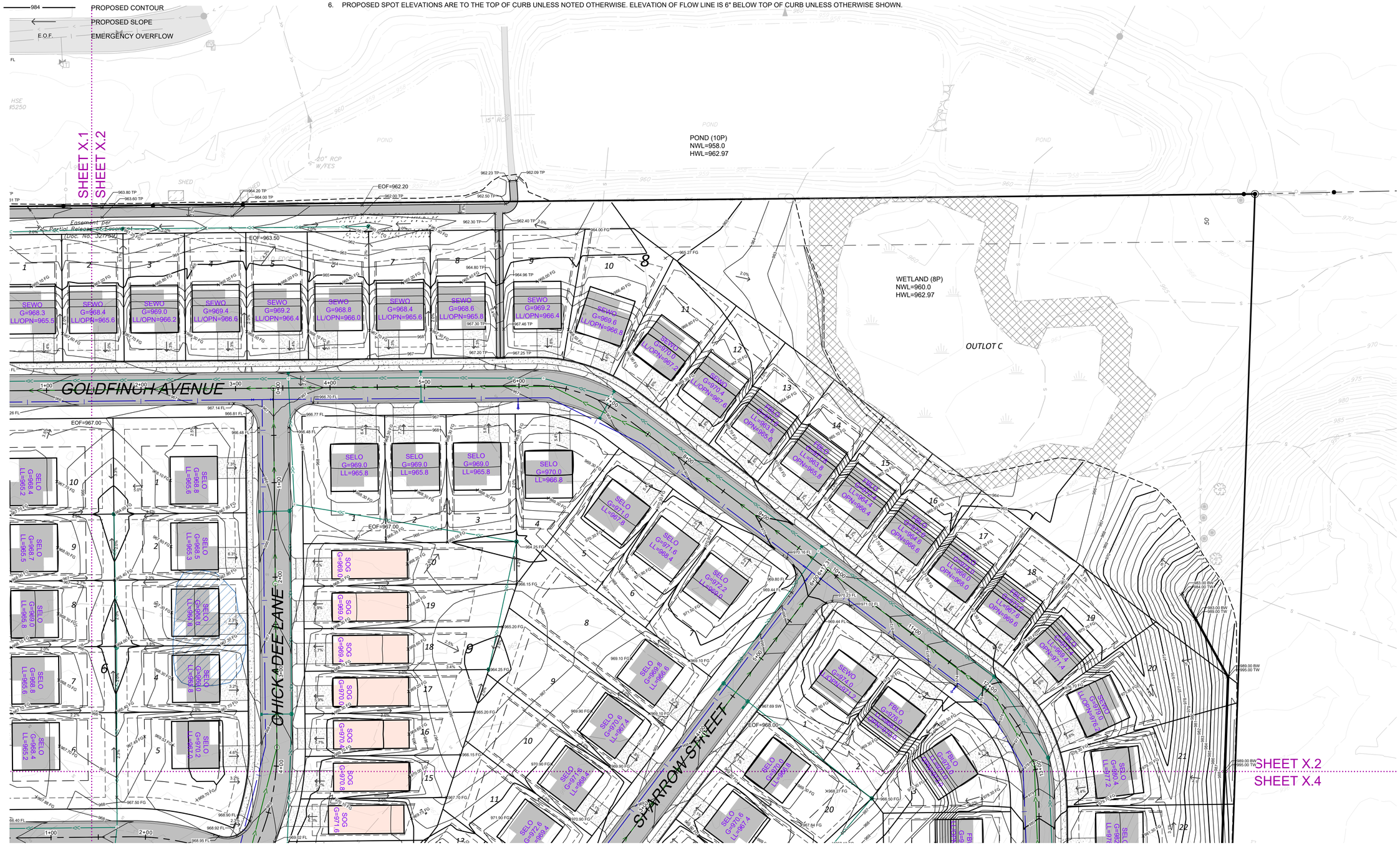
GRADING GENERAL NOTES:

1. THE CONTRACTOR SHALL NOTE ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS IN THE FIELD REPRESENTED WITHIN THE PLANS AS SHOWN AND ALERT THE ENGINEER BEFORE BIDDING THE PROJECT AND BEGINNING CONSTRUCTION.
2. CONTRACTOR SHALL LOCATE AND VERIFY ALL UTILITIES WHICH MAY AFFECT THIS WORK AND NOTIFY THE OWNER OF ANY CHANGES. CONTACT LOCAL UTILITY COMPANIES FOR EXACT LOCATIONS PRIOR TO BIDDING THE PROJECT AND COMMENCING WORK.
3. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT SILT AND DEBRIS RUN-OFF DURING GRADING OPERATIONS (I.E. SILT FENCE, STRAW BALES, ETC.).
4. CONTRACTOR SHALL VERIFY CRITICAL ELEVATIONS TO ENSURE CONFORMANCE WITH GRADING PLAN, PARTICULARLY WITH EXISTING STRUCTURES AND/OR PAVEMENTS TO REMAIN. MEET EXISTING GRADES ALONG STREETS, PROPERTY LINES, AND DRIVEWAY ENTRANCES. RESTORE ALL PAVEMENTS THAT REMAIN TO THEIR ORIGINAL IF NOT BETTER CONDITION. NOTIFY OWNER OF ANY CONFLICTS PRIOR TO BIDDING THE PROJECT.
5. TURF ESTABLISHMENT AREAS SHALL RECEIVE MINIMUM OF 4" DEPTH AS MEASURED IN PLACE OF TOPSOIL. TOPSOIL WILL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. ALL GRADED SLOPES GREATER THAN OR EQUAL TO 5:1 SHALL BE HYDROSEEDED, EROSION CONTROL BLANKETED, OR MULCHED TO HELP STABILIZE THE SLOPES BY GENERAL CONTRACTOR.
6. PROPOSED SPOT ELEVATIONS ARE TO THE TOP OF CURB UNLESS NOTED OTHERWISE. ELEVATION OF FLOW LINE IS 6" BELOW TOP OF CURB UNLESS OTHERWISE SHOWN.

N

0 50'

SCALE: 1" = 50'



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2	07/26/2024	UPDATED WITH NEW LAYOUT
3	12/11/2024	REVISED PER CITY COMMENTS

DATE: 12/11/2024
DESIGN BY: MJM
DRAWN BY: MJM
CHECKED BY: CJD
DWG FILE: GRADING
FILE NO.: 21-0300.00

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Signed: _____ Lic. No. _____

Date: _____

BOGART, PEDERSON & ASSOCIATES, INC.
LAND SURVEYING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES
13076 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-9822 FAX: 763-262-9844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

NE GRADING PLAN

SHEET NO.

C3.2

12/4/2024 10:37 AM n:\projects current\21-0300.00\tamarack monticello nelson\Civil\civil files\Grading Plan.dwg

LEGEND:

	PROPOSED RIP RAP
980.50 TC	NEW TOP-BACK OF CURB ELEVATION
980.50 FL	NEW FLOW LINE OF CURB ELEVATION
980.50 SW	NEW SIDEWALK ELEVATION
980.50 TP	NEW TOP OF PAVEMENT ELEVATION
980.50 TG	NEW TOP OF GRAVEL ELEVATION
980.50 FG	NEW FINISHED GRADE ELEVATION
980.50 EX	EXISTING ELEVATION
984	PROPOSED CONTOUR
	PROPOSED SLOPE
E.O.F.	EMERGENCY OVERFLOW

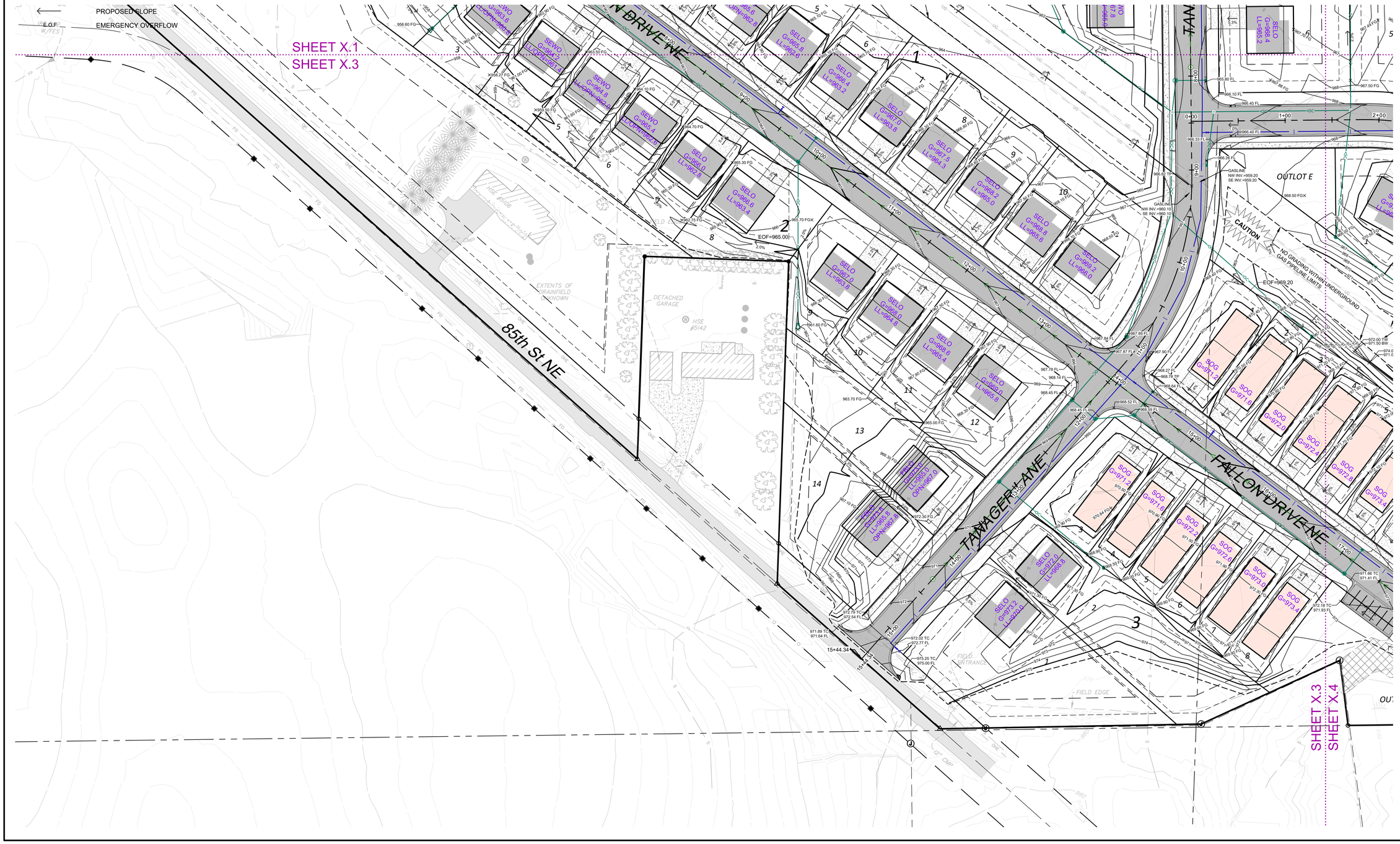
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MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

SW GRADING PLAN

SHEET NO.

C3.3

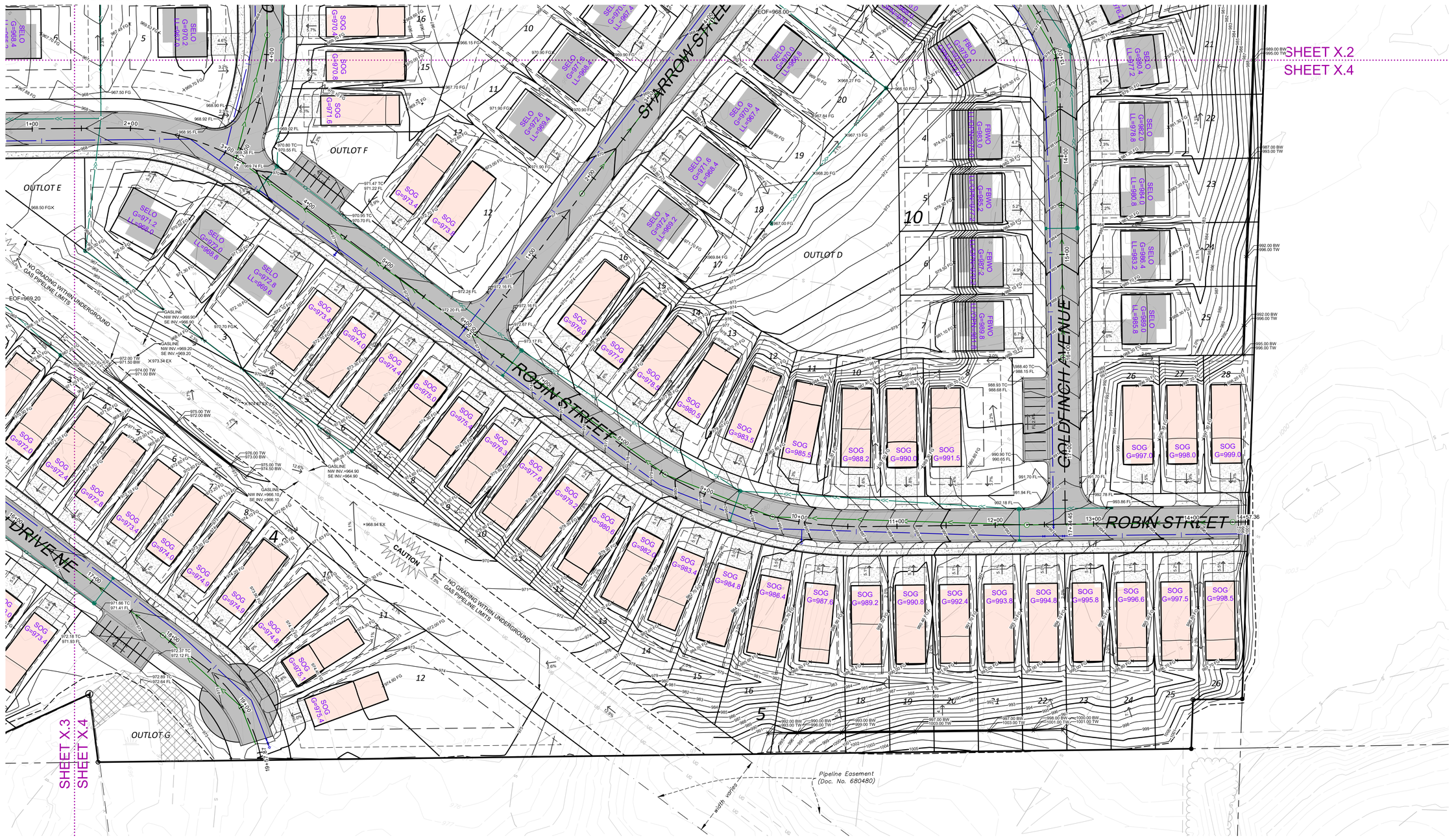
12/24/2024 10:38 AM n:\projects\ current\21-0300.00 tamarack monticello nelson\Civil\cad files\Grading\Plan.dwg

LEGEND:

	PROPOSED RIP RAP
980.50 TC	NEW TOP-BACK OF CURB ELEVATION
980.50 FL	NEW FLOW LINE OF CURB ELEVATION
980.50 SW	NEW SIDEWALK ELEVATION
980.50 TP	NEW TOP OF PAVEMENT ELEVATION
980.50 TG	NEW TOP OF GRAVEL ELEVATION
980.50 FG	NEW FINISHED GRADE ELEVATION
980.50 EX	EXISTING ELEVATION
984	PROPOSED CONTOUR
	PROPOSED SLOPE
E.O.F.	EMERGENCY OVERFLOW

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13079 FIRST STREET, BECKER, MN 55308-3522
TEL: 763-262-9622 FAX: 763-262-9644

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

SE GRADING PLAN

SHEET NO.
C3.4

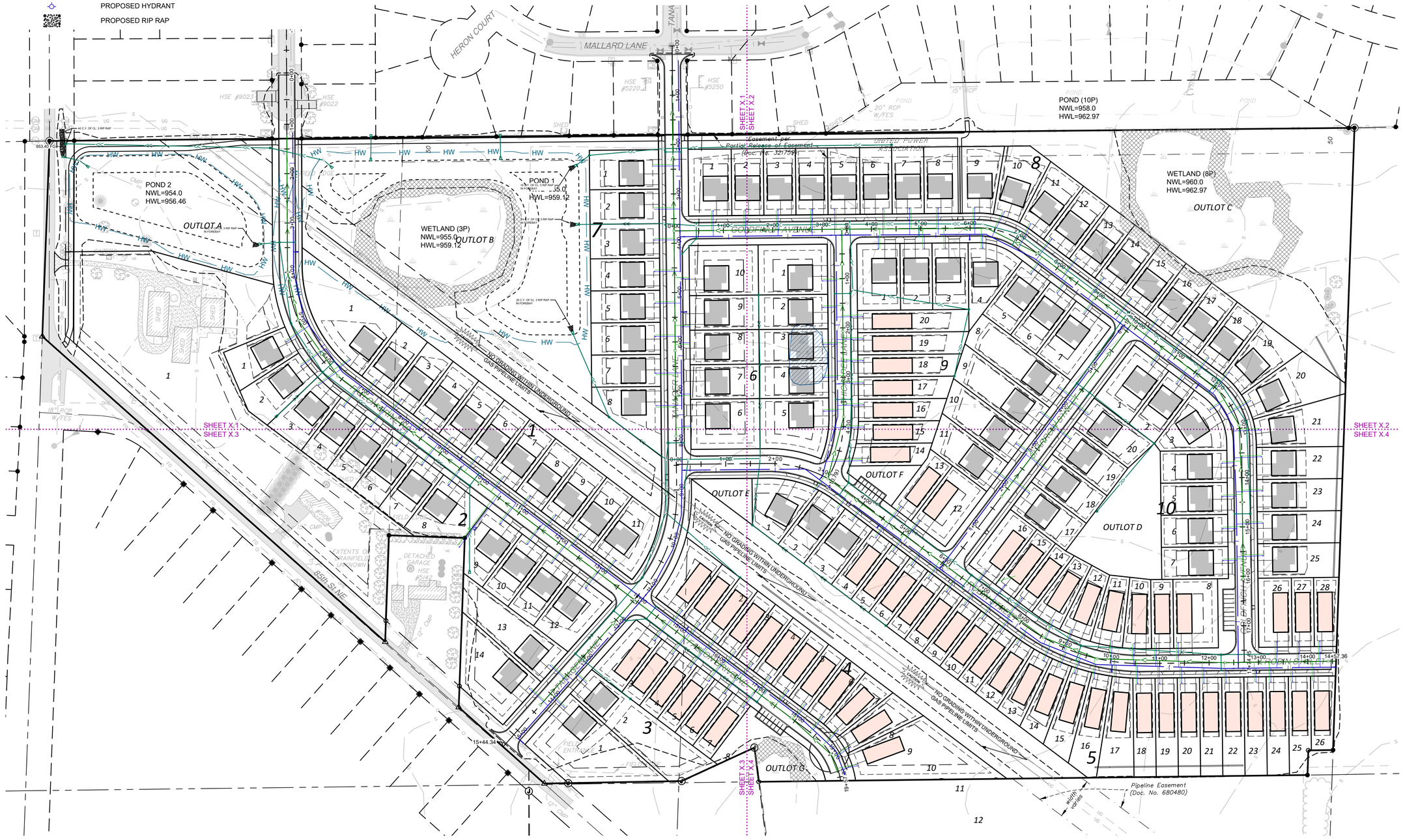
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LEGEND:

- PROPOSED STORM SEWER
- PROPOSED WATER LINE
- PROPOSED SANITARY SEWER
- PROPOSED WATER SERVICE
- PROPOSED SANITARY SERVICE
- PROPOSED SANITARY MANHOLE
- PROPOSED FLARED END SECITON
- PROPOSED STORM MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED GATE VALVE & BOX
- PROPOSED HYDRANT
- PROPOSED RIP RAP

UTILITY GENERAL NOTES:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL UTILITY RELOCATIONS.
2. CONTRACTOR SHALL LOCATE AND VERIFY ALL UTILITIES WHICH MAY AFFECT THIS WORK AND NOTIFY OWNER OF ANY CHANGES. CONTACT LOCAL UTILITY COMPANIES FOR EXACT LOCATIONS PRIOR TO BIDDING THE PROJECT AND COMMENCING WORK.
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5. WATER LINE TO MINIMUM 8.0 FEET DEPTH.
6. VERIFY INVERT ELEVATIONS OF EXISTING SANITARY LINE AT POINT OF CONNECTION WITH NEW SANITARY LINE PRIOR TO INSTALLING ANY NEW UTILITIES.
7. ALL CROSSING ELEVATIONS OF NEW UTILITIES & SIZES OF THE EXISTING UTILITIES ARE BASED ON ASSUMED ELEVATIONS AND SIZES PROVIDED BY THE SURVEY.
8. ALL SANITARY SERVICE PIPE AND FITTINGS WILL BE SCHDULE 40.
9. ALL STORM SEWER SHALL BE PVC SCHEDULE 40 WHEN LESS THAN 8" IN DIAMETER. ALL RCP STORM SEWER SHALL BE CLASS V PIPE UNLESS OTHERWISE NOTED. ALL HDPE STORM SEWER SHALL BE DUAL WALL HIGH PERFORMANCE POLYPROPYLENE PIPE AND SHALL CONFORM TO AASHTO M330.
10. ALL WATER LINES 4" OR GREATER SHALL CONFORM TO AWWA C900, AWWA C150, OR GRADE PE-3408 OR GRADE PE4710 PIPE AND SHALL BE RATED FOR 200 PSI. ALL WATER LINES LESS THAT 4" SHALL CONFORM TO AWWA C901 SIDR 7 (HDPE WATER LINE) OR TYPE K COPPER PIPE.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING TWO CONSECUTIVE PASSING BACTERIOLOGICAL TESTS FROM THE PROPOSED WATER SERVICE.
12. THE APPLICANT SHALL BE RESPONSIBLE FOR REPLACING ANY CONCRETE PAVEMENT WHICH IS DAMAGED OR REMOVED AS A RESULT OF THE PROPOSED WATER, SANITARY, STORM SEWER SERVICE INSTALLATION.
13. SEE DETAILS FOR SPECIFIC MODELS USED FOR CURB STOPS, MANHOLES, VALVES, ETC.
14. IF DEWATERING IS REQUIRED FOR THIS PROJECT, THE PUMP DISCHARGE SHALL BE TREATED PRIOR TO BEING DISCHARGED OFF-SITE OR INTO A SURFACE WATER. THE DISCHARGE SHALL BE VISUALLY CHECKED TO ENSURE THAT IT IS VISIBLY CLEAN WATER. NO DEWATERING IS EXPECTED FOR THIS SITE DUE TO SANDY SOIL CONDITIONS.
15. CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL PLAN FOR PAVEMENT REMOVAL, UTILITY INSTALLATION, AND REPLACEMENT AS NEEDED.



0 100'

SCALE: 1" = 100'

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LAND SURVEYING
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ENVIRONMENTAL SERVICES
13076 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-9822 FAX: 763-262-9844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

OVERALL UTILITY PLAN

SHEET NO.

C4.0

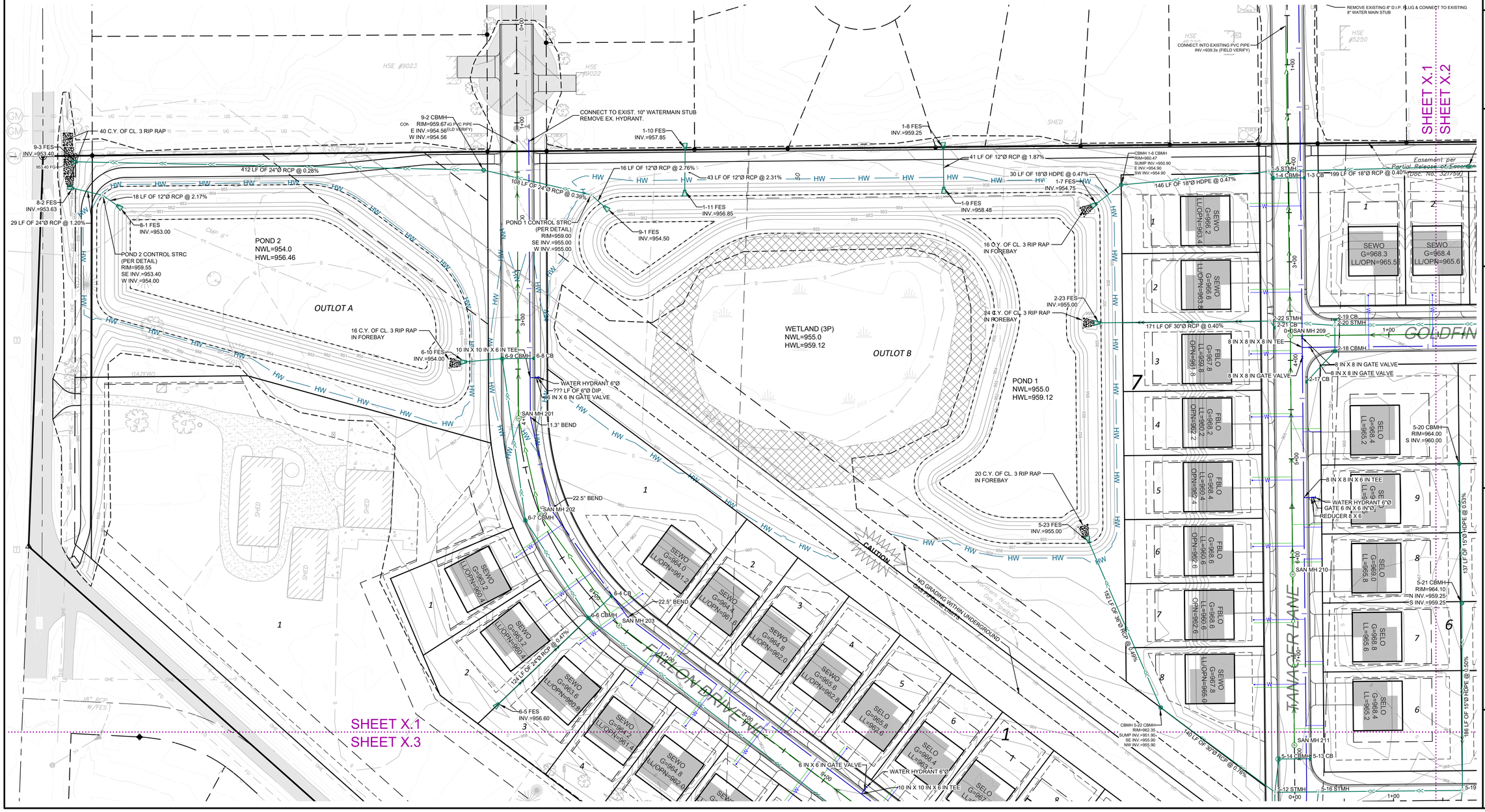
12/24/2024 10:45 AM n:\projects current\21-0300.00 tamarack monticello nelson\Civil\cad files\Utility Profiles.dwg

LEGEND:

- PROPOSED STORM SEWER
- PROPOSED WATER LINE
- PROPOSED SANITARY SEWER
- PROPOSED WATER SERVICE
- PROPOSED SANITARY SERVICE
- PROPOSED SANITARY MANHOLE
- PROPOSED FLARED END SECITON
- PROPOSED STORM MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED GATE VALVE & BOX
- PROPOSED HYDRANT
- PROPOSED RIP RAP

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TEL: 763-261-3822 FAX: 763-262-3844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

NW UTILITY PLAN

SHEET NO.
C4.1

12/24/2024 10:41 AM n:\projects current\21-0300.00 tamarack monticello wilson\Civil\Cad files\Utility Profiles.dwg

LEGEND:

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- PROPOSED WATER LINE
- PROPOSED SANITARY SEWER
- PROPOSED WATER SERVICE
- PROPOSED SANITARY SERVICE
- PROPOSED SANITARY MANHOLE
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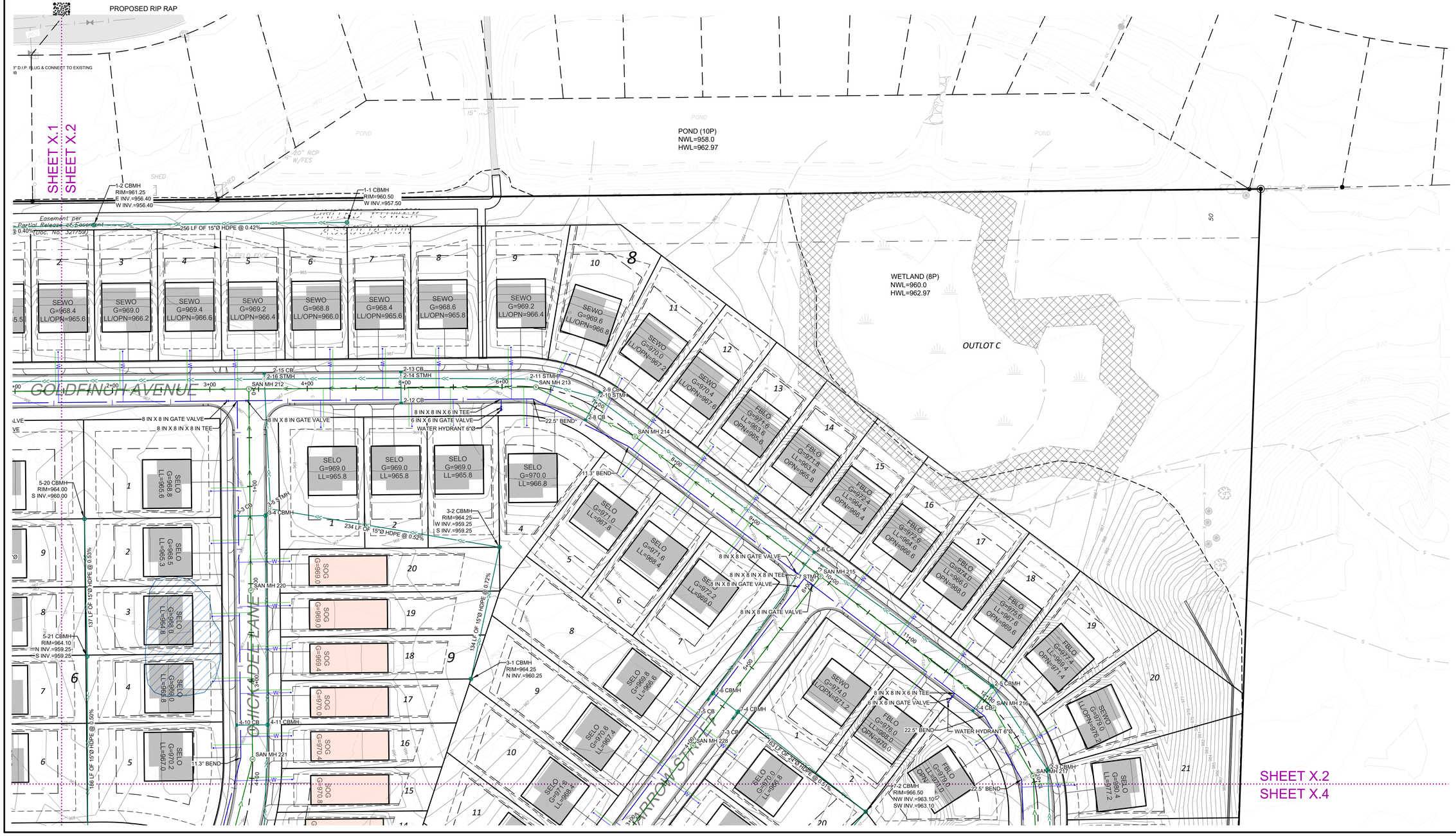
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N

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MEADOWS AT PIONEER PARK
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NE UTILITY PLAN

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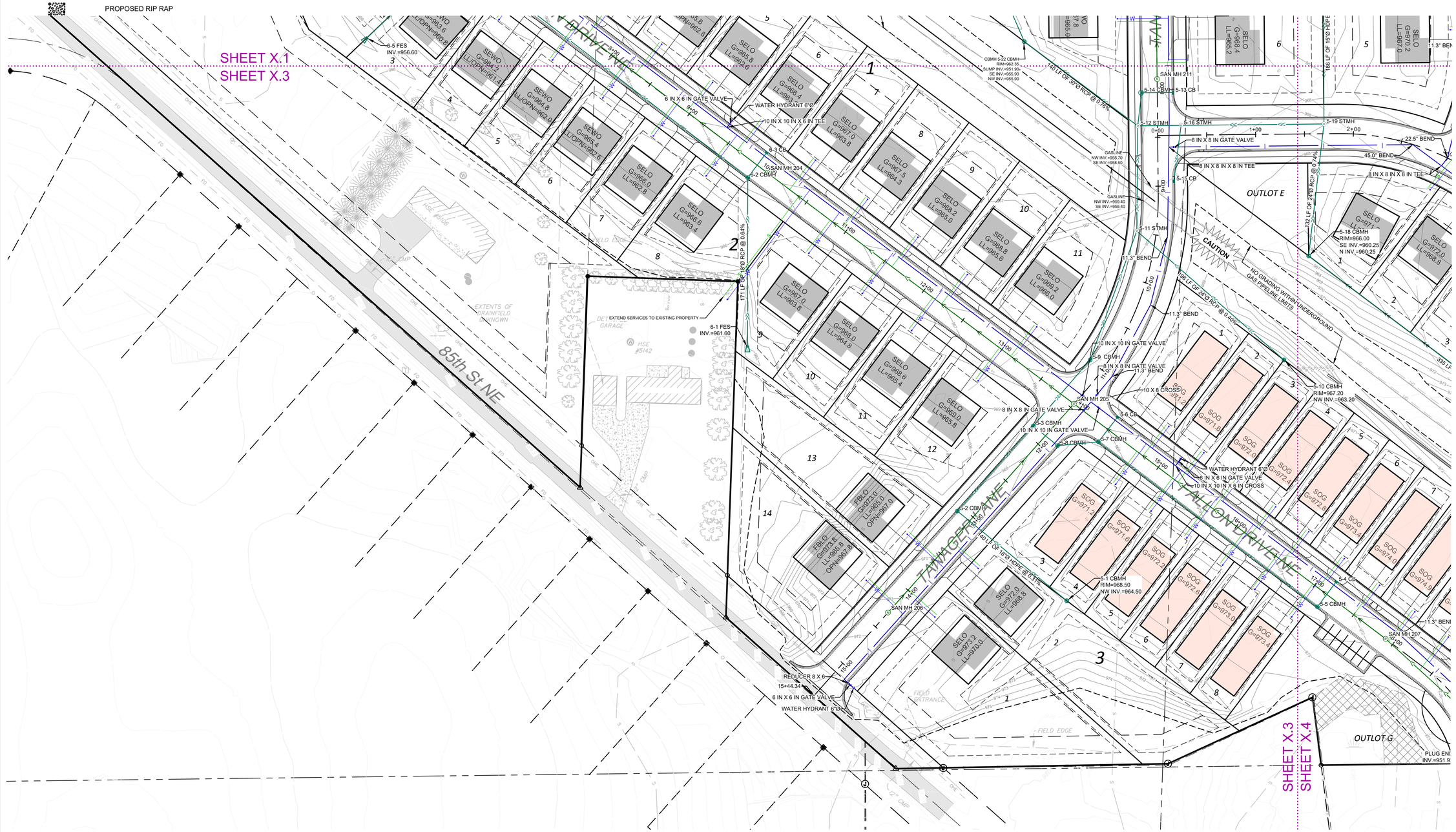
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LEGEND:

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- PROPOSED WATER LINE
- PROPOSED SANITARY SEWER
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- PROPOSED SANITARY MANHOLE
- PROPOSED FLARED END SECITON
- PROPOSED STORM MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED GATE VALVE & BOX
- PROPOSED HYDRANT
- PROPOSED RIP RAP

UTILITY GENERAL NOTES:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL UTILITY RELOCATIONS.
2. CONTRACTOR SHALL LOCATE AND VERIFY ALL UTILITIES WHICH MAY AFFECT THIS WORK AND NOTIFY OWNER OF ANY CHANGES. CONTACT LOCAL UTILITY COMPANIES FOR EXACT LOCATIONS PRIOR TO BIDDING THE PROJECT AND COMMENCING WORK.
3. CONTRACTOR SHALL VERIFY CRITICAL ELEVATIONS TO ENSURE CONFORMANCE WITH GRADING PLAN AND EXISTING UTILITIES, PARTICULARLY WITH EXISTING STRUCTURES AND/OR PAVEMENTS TO REMAIN.
4. THE CONTRACTOR SHALL NOTE ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS AS EXISTING IN THE FIELD AND AS REPRESENTED WITHIN THE PLANS AS SHOWN AND ALERT THE ENGINEER BEFORE BIDDING THE PROJECT AND BEGINNING CONSTRUCTION.
5. WATER LINE TO MINIMUM 8.0 FEET DEPTH.
6. VERIFY INVERT ELEVATIONS OF EXISTING SANITARY LINE AT POINT OF CONNECTION WITH NEW SANITARY LINE PRIOR TO INSTALLING ANY NEW UTILITIES.
7. ALL CROSSING ELEVATIONS OF NEW UTILITIES & SIZES OF THE EXISTING UTILITIES ARE BASED ON ASSUMED ELEVATIONS AND SIZES PROVIDED BY THE SURVEY.
8. ALL SANITARY SERVICE PIPE AND FITTINGS WILL BE SCHDULE 40.
9. ALL STORM SEWER SHALL BE PVC SCHEDULE 40 WHEN LESS THAN 8" IN DIAMETER. ALL RCP STORM SEWER SHALL BE CLASS V PIPE UNLESS OTHERWISE NOTED. ALL HDPE STORM SEWER SHALL BE DUAL WALL HIGH PERFORMANCE POLYPROPYLENE PIPE AND SHALL CONFORM TO AASHTO M330.
10. ALL WATER LINES 4" OR GREATER SHALL CONFORM TO AWWA C900, AWWA C150, OR GRADE PE-3408 OR GRADE PE4710 PIPE AND SHALL BE RATED FOR 200 PSI. ALL WATER LINES LESS THAT 4" SHALL CONFORM TO AWWA C901 SIDR 7 (HDPE WATER LINE) OR TYPE K COPPER PIPE.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING TWO CONSECUTIVE PASSING BACTERIOLOGICAL TESTS FROM THE PROPOSED WATER SERVICE.
12. THE APPLICANT SHALL BE RESPONSIBLE FOR REPLACING ANY CONCRETE PAVEMENT WHICH IS DAMAGED OR REMOVED AS A RESULT OF THE PROPOSED WATER, SANITARY, STORM SEWER SERVICE INSTALLATION.
13. SEE DETAILS FOR SPECIFIC MODELS USED FOR CURB STOPS, MANHOLES, VALVES, ETC.
14. IF DEWATERING IS REQUIRED FOR THIS PROJECT, THE PUMP DISCHARGE SHALL BE TREATED PRIOR TO BEING DISCHARGED OFF-SITE OR INTO A SURFACE WATER. THE DISCHARGE SHALL BE VISUALLY CHECKED TO ENSURE THAT IT IS VISIBLY CLEAN WATER. NO DEWATERING IS EXPECTED FOR THIS SITE DUE TO SANDY SOIL CONDITIONS.
15. CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL PLAN FOR PAVEMENT REMOVAL, UTILITY INSTALLATION, AND REPLACEMENT AS NEEDED.



0 50'

SCALE: 1" = 50'

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3	12/11/2024	REVISED PER CITY COMMENTS

DATE: 12/11/2024
DESIGN BY: MJM
DRAWN BY: MJM
CHECKED BY: CJD
DWG FILE: UTILITY
FILE NO.: 21-0300.00

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Signed: _____ Lic. No. _____

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BOGART, PEDERSON & ASSOCIATES, INC.
LAND SURVEYING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES
1307B FIRST STREET, BECKER, MN 55308-9322
TEL: 763-261-3822 FAX: 763-262-5844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

SW UTILITY PLAN

SHEET NO.

C4.3

12/24/2024 10:41 AM n:\projects current\21-0300.00 tamarack monticello nelson\Civil\Cad files\Utility Profiles.dwg

LEGEND:

- PROPOSED STORM SEWER
- PROPOSED WATER LINE
- PROPOSED SANITARY SEWER
- PROPOSED WATER SERVICE
- PROPOSED SANITARY SERVICE
- PROPOSED SANITARY MANHOLE
- PROPOSED FLARED END SECITON
- PROPOSED STORM MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED GATE VALVE & BOX
- PROPOSED HYDRANT
- PROPOSED RIP RAP

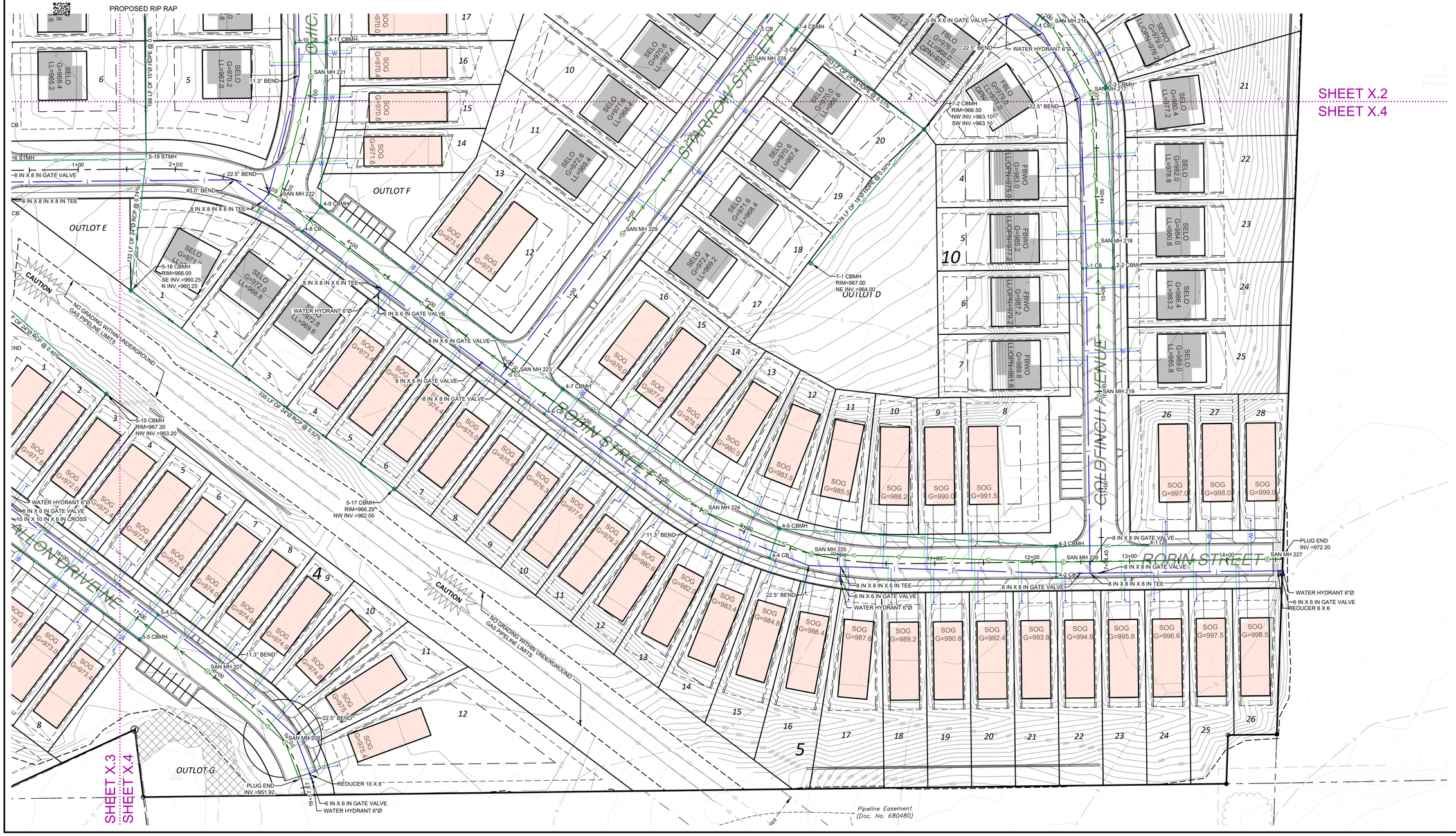
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N

0 50'

SCALE: 1" = 50'



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DATE: 12/11/2024
DESIGN BY: MJM
DRAWN BY: MJM
CHECKED BY: CJD
DWG FILE: UTILITY
FILE NO.: 21-0300.00

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Signed: _____ Lic. No. _____

Date: _____

BOGART, PEDERSON & ASSOCIATES, INC.
LAND SURVEYING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES
13076 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-9822 FAX: 763-262-9844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

SE UTILITY PLAN

SHEET NO.

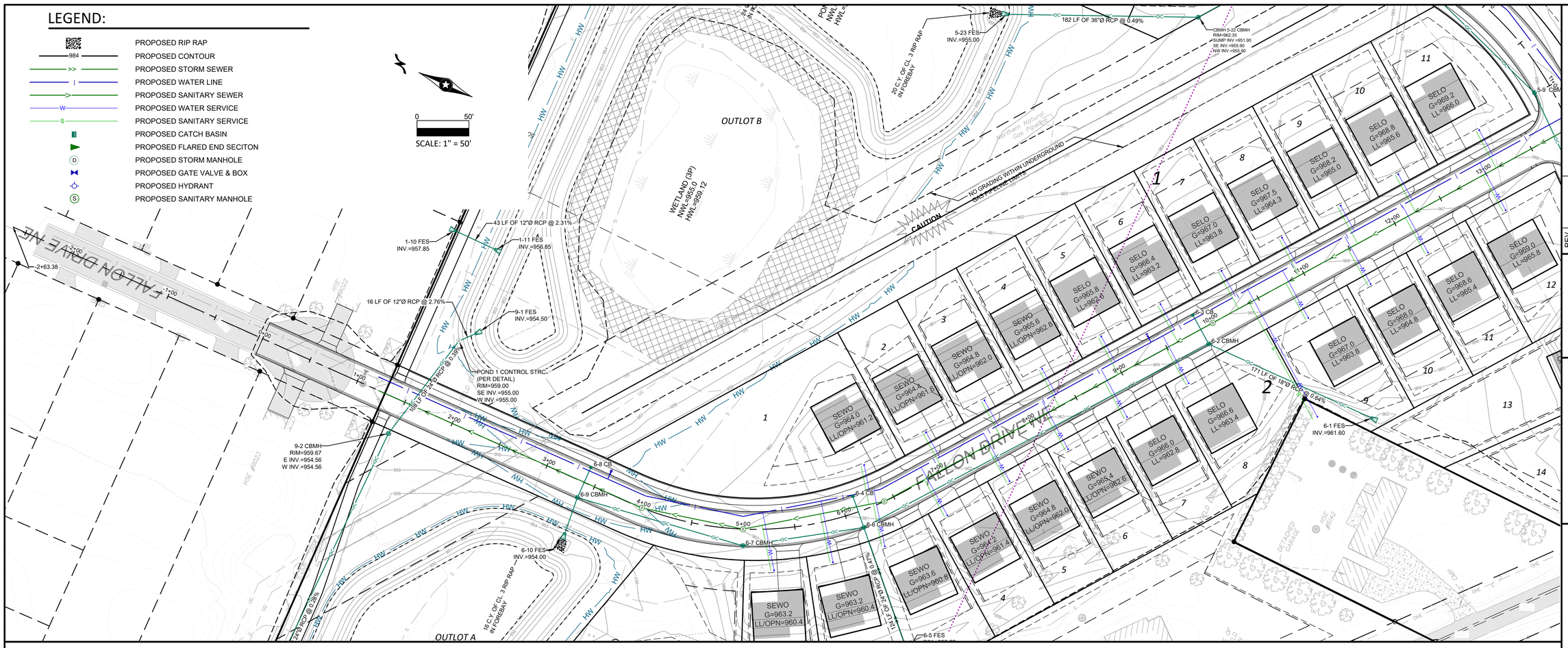
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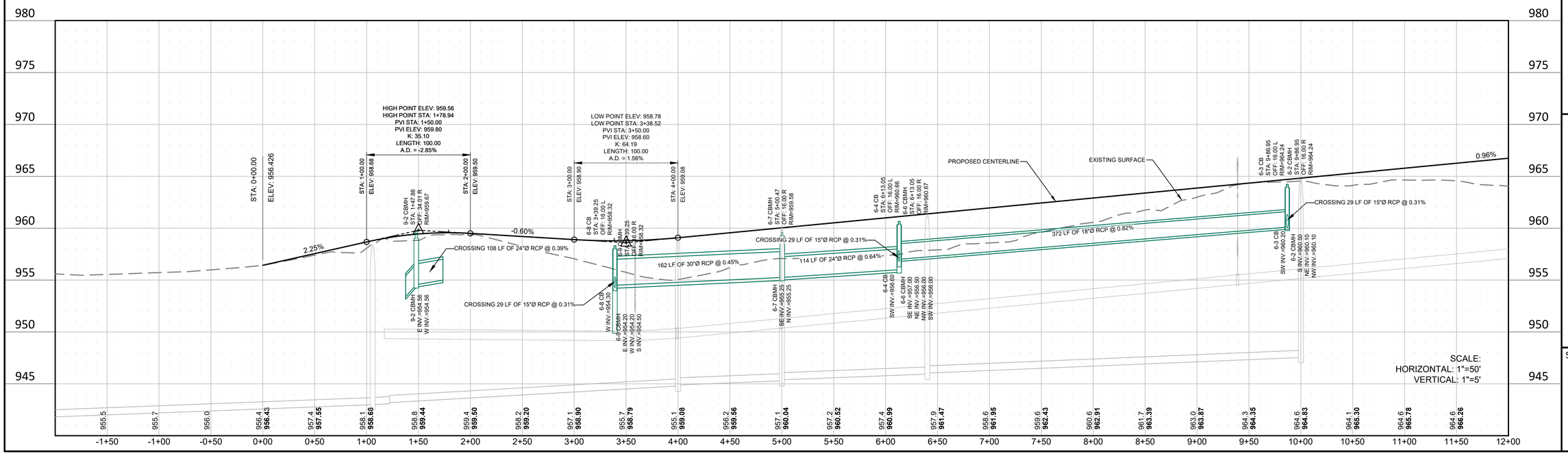
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LEGEND:

- PROPOSED RIP RAP
- 984 — PROPOSED CONTOUR
- >> — PROPOSED STORM SEWER
- W — PROPOSED WATER LINE
- —> — PROPOSED SANITARY SEWER
- W — PROPOSED WATER SERVICE
- S — PROPOSED SANITARY SERVICE
- PROPOSED CATCH BASIN
- PROPOSED FLARED END SECITON
- D — PROPOSED STORM MANHOLE
- PROPOSED GATE VALVE & BOX
- PROPOSED HYDRANT
- S — PROPOSED SANITARY MANHOLE

0 50'
SCALE: 1" = 50'





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FILE NO.: 21-0300.00

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13079 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-9822 FAX: 763-262-9844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

STREET & STORM-FALLON DRIVE NE (1)

SHEET NO.
C5.1

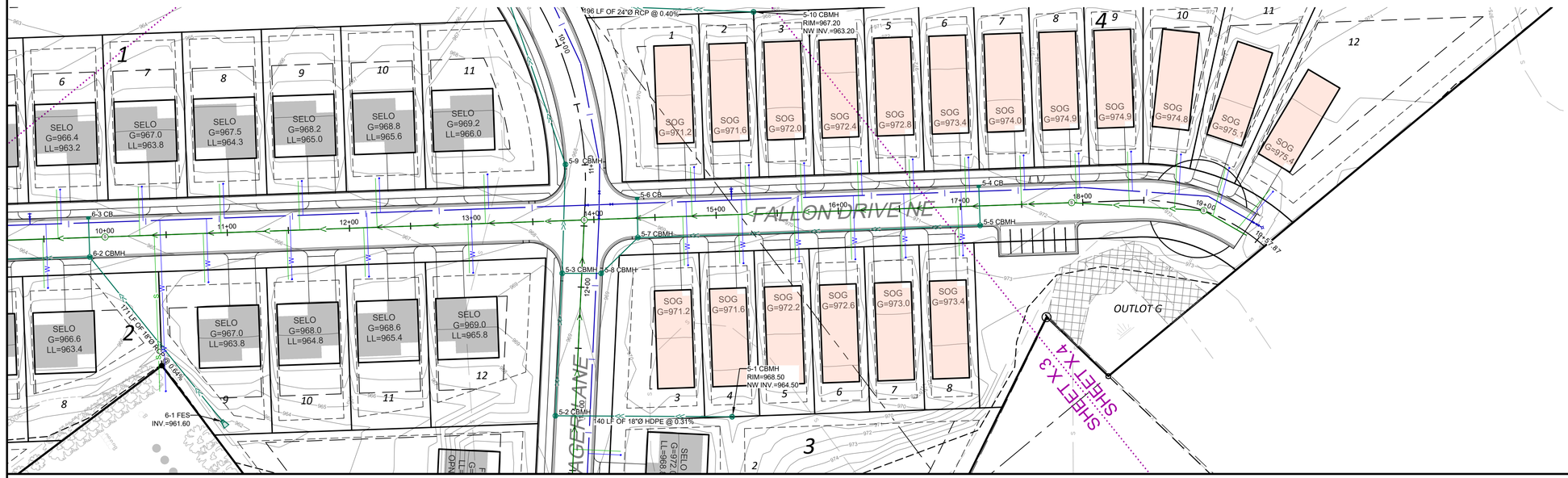
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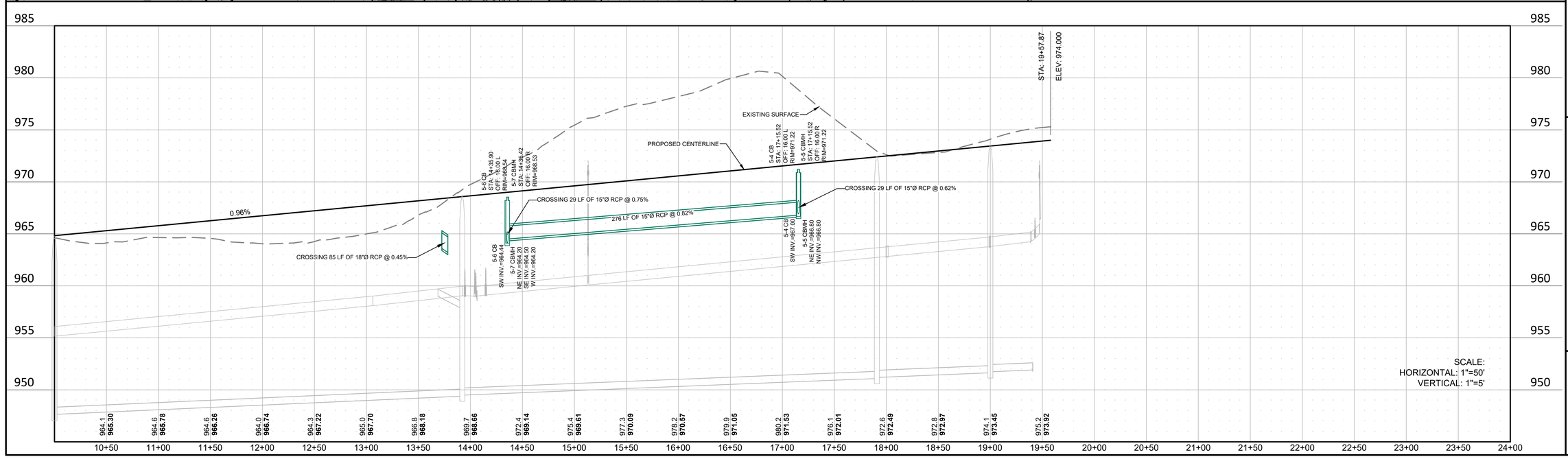
LEGEND:

- PROPOSED RIP RAP
- 984 — PROPOSED CONTOUR
- >> — PROPOSED STORM SEWER
- I — PROPOSED WATER LINE
- > — PROPOSED SANITARY SEWER
- W — PROPOSED WATER SERVICE
- S — PROPOSED SANITARY SERVICE
- PROPOSED CATCH BASIN
- PROPOSED FLARED END SECITON
- D — PROPOSED STORM MANHOLE
- PROPOSED GATE VALVE & BOX
- PROPOSED HYDRANT
- S — PROPOSED SANITARY MANHOLE

0 50'

SCALE: 1" = 50'





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13076 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-9082 FAX: 763-262-9844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

STREET & STORM-FALLON DRIVE NE (2)

SHEET NO.

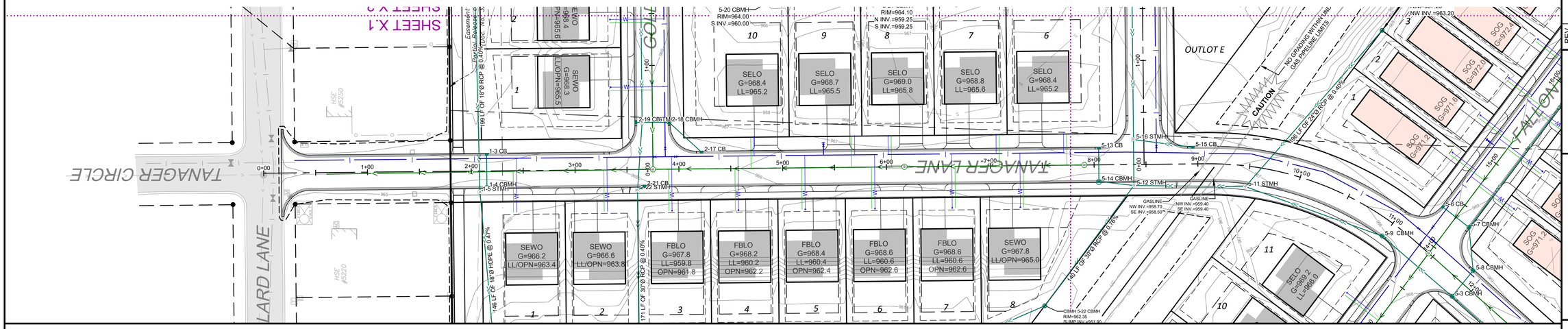
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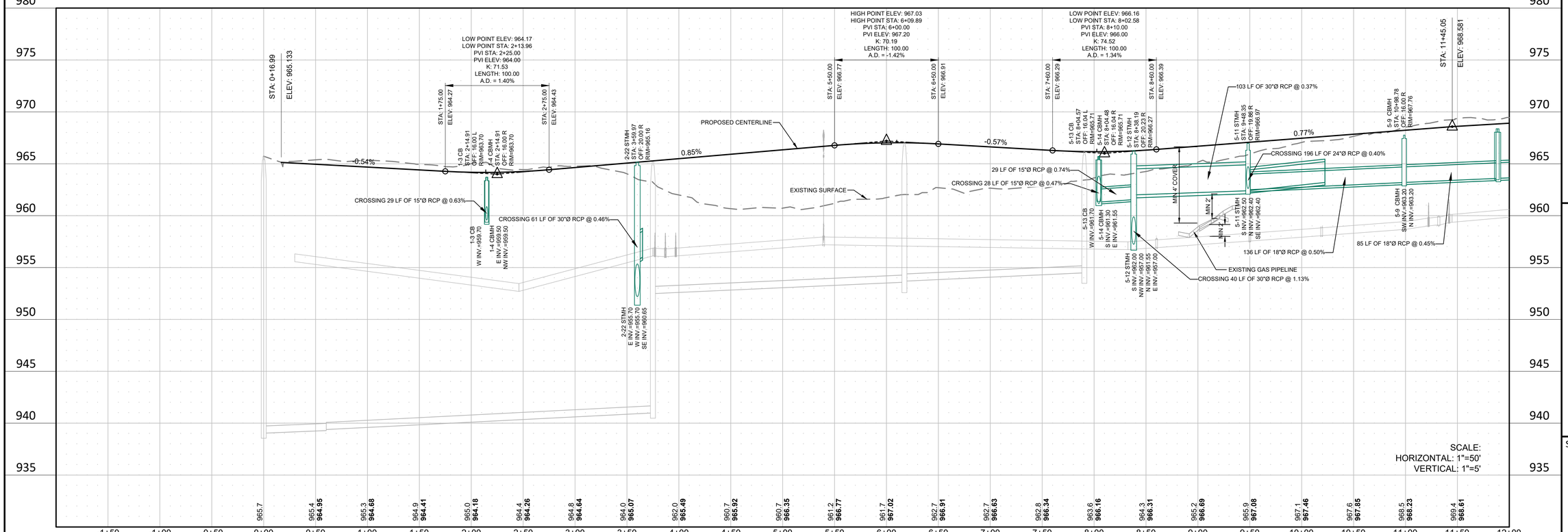
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LEGEND:

- PROPOSED RIP RAP
- 984 PROPOSED CONTOUR
- PROPOSED STORM SEWER
- PROPOSED WATER LINE
- PROPOSED SANITARY SEWER
- W PROPOSED WATER SERVICE
- S PROPOSED SANITARY SERVICE
- PROPOSED CATCH BASIN
- PROPOSED FLARED END SECITON
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- PROPOSED GATE VALVE & BOX
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- S PROPOSED SANITARY MANHOLE

SCALE: 1" = 50'





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LAND SURVEYING
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13076 FIRST STREET BECKER, MN 55308-9322
TEL: 763-262-9822 FAX: 763-262-9844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

STREET & STORM-TANAGER LANE (1)

SHEET NO.
C5.3

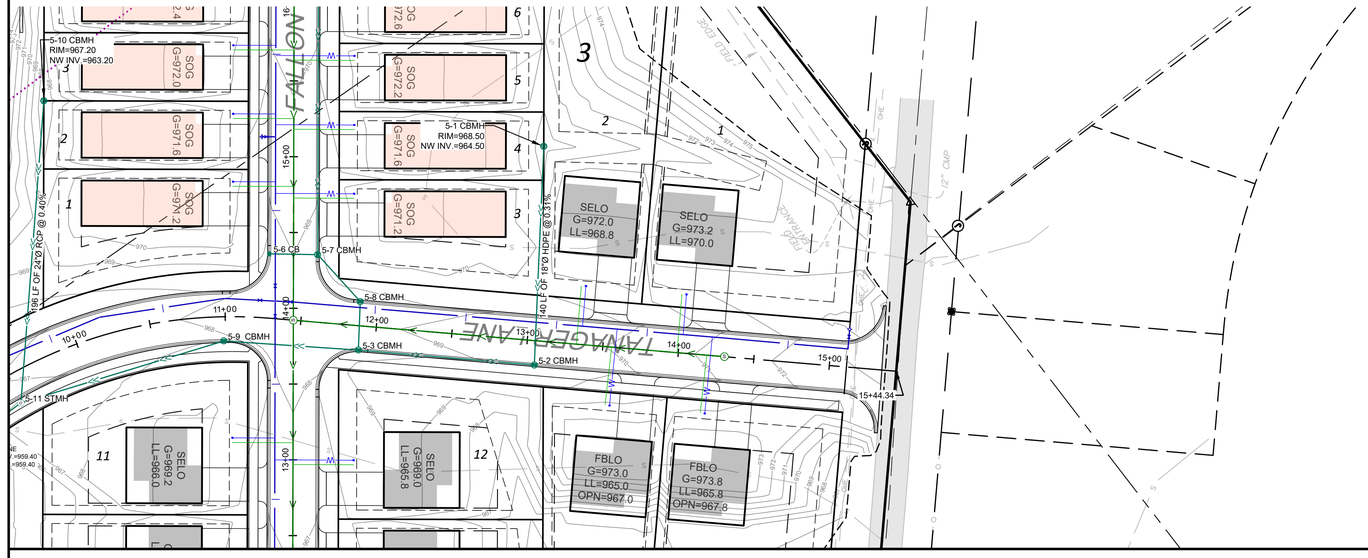
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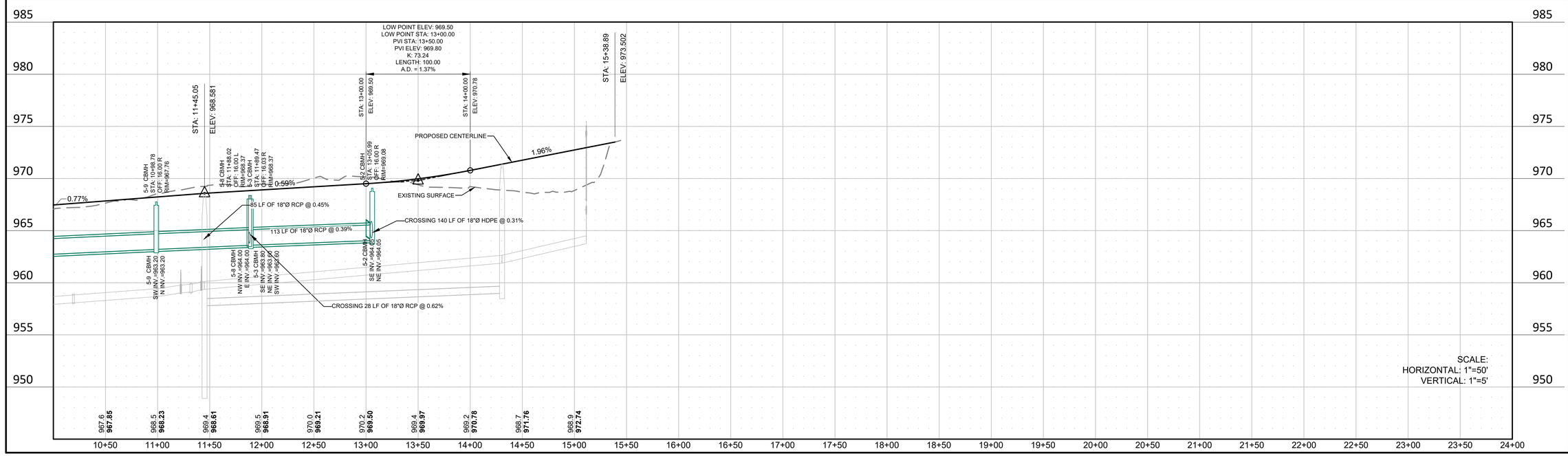
LEGEND:

- PROPOSED RIP RAP
- 984 PROPOSED CONTOUR
- PROPOSED STORM SEWER
- PROPOSED WATER LINE
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- D PROPOSED STORM MANHOLE
- PROPOSED GATE VALVE & BOX
- PROPOSED HYDRANT
- S PROPOSED SANITARY MANHOLE

0 50'

SCALE: 1" = 50'





SCALE:
HORIZONTAL: 1"=50'
VERTICAL: 1"=5'

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13978 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-9822 FAX: 763-262-9844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

STREET & STORM-TANAGER LANE (2)

SHEET NO.

C5.4

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LEGEND:

- PROPOSED RIP RAP
- PROPOSED CONTOUR
- PROPOSED STORM SEWER
- PROPOSED WATER LINE
- PROPOSED SANITARY SEWER
- PROPOSED WATER SERVICE
- PROPOSED SANITARY SERVICE
- PROPOSED CATCH BASIN
- PROPOSED FLARED END SECITON
- PROPOSED STORM MANHOLE
- PROPOSED GATE VALVE & BOX
- PROPOSED HYDRANT
- PROPOSED SANITARY MANHOLE

SCALE: 1" = 50'

GOLDFINCH AVENUE

CHICKADEE LANE

MANAGER LANE

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TEL: 763.261.4822 | FAX: 763.262.9844

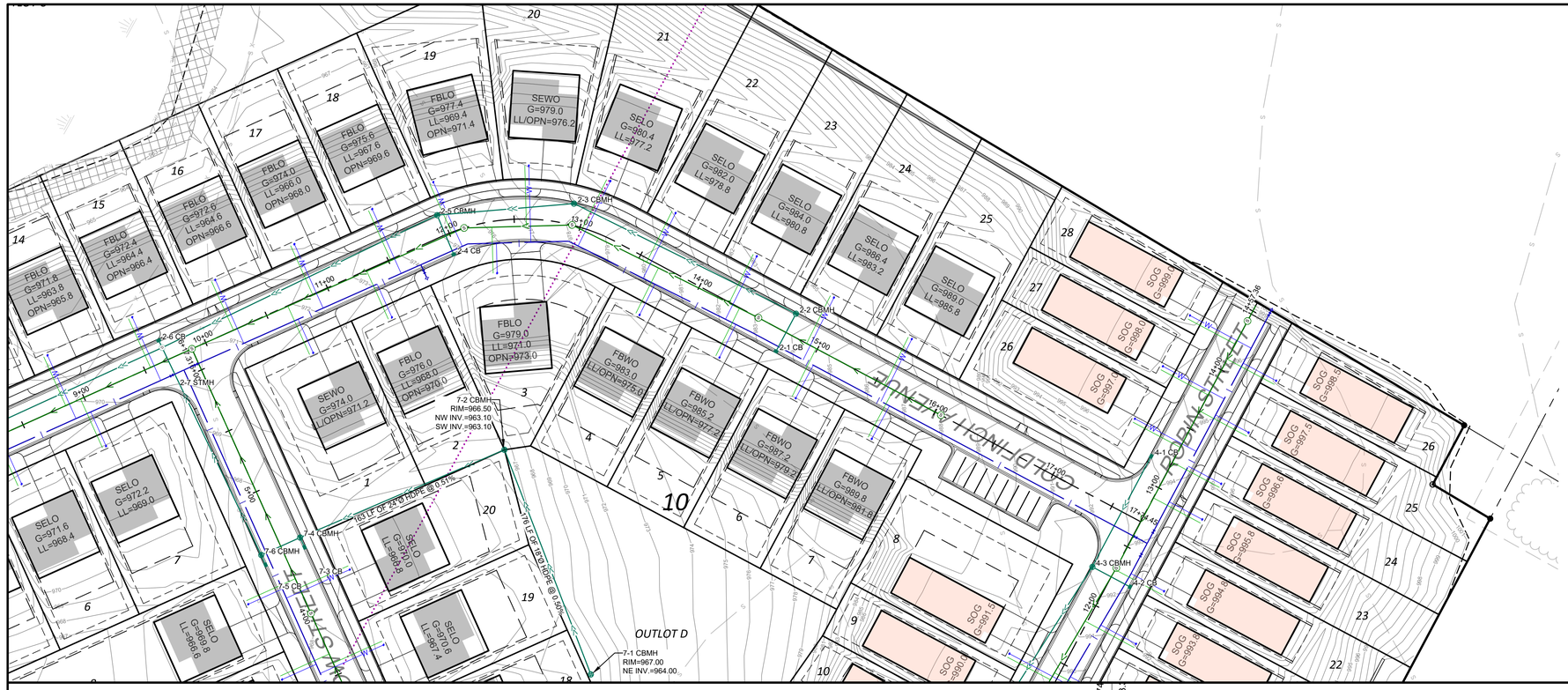
MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

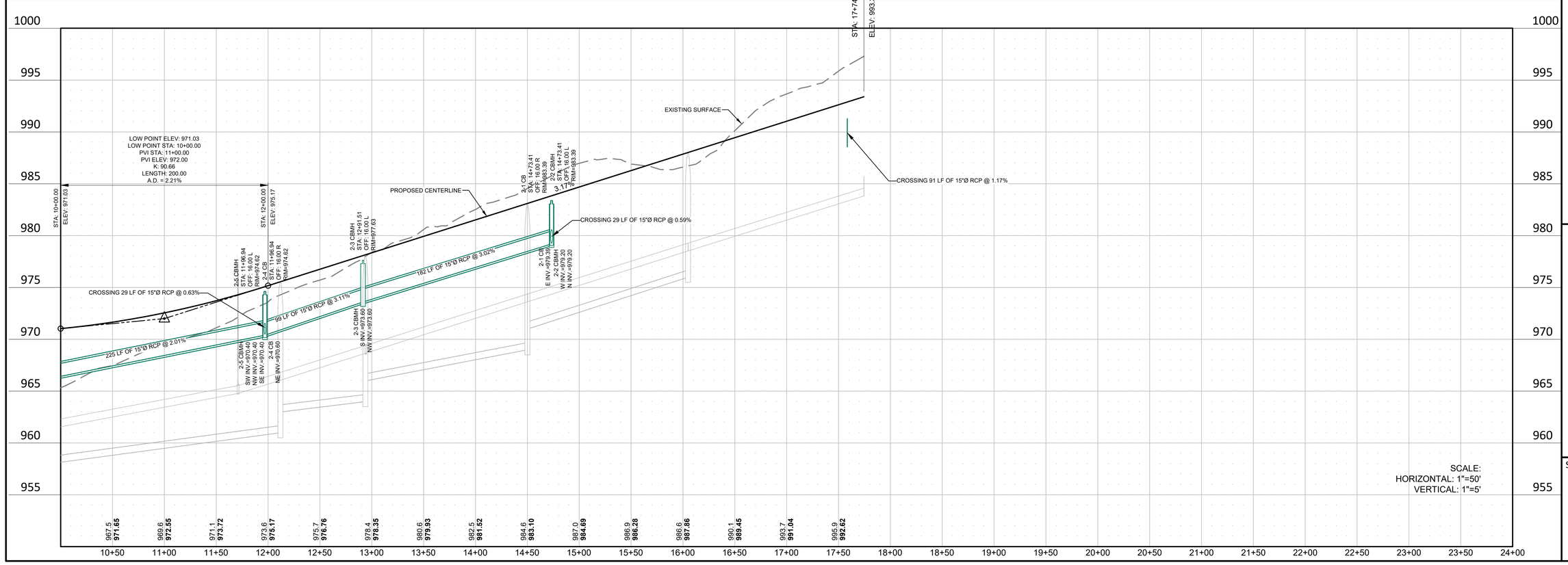
STREET & STORM-GOLDFINCH AVENUE (1)

SHEET NO.
C5.5

SCALE:
HORIZONTAL: 1"=50'
VERTICAL: 1"=5'

12/24/2024 10:45 AM n:\projects current\21-0300.00\tamarack monticello nelson\Civil\cad files\Utility Profiles.dwg





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CIVIL ENGINEERING
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13076 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-9822 FAX: 763-262-9844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

STREET & STORM-GOLDFINCH (2)

SHEET NO.

C5.6

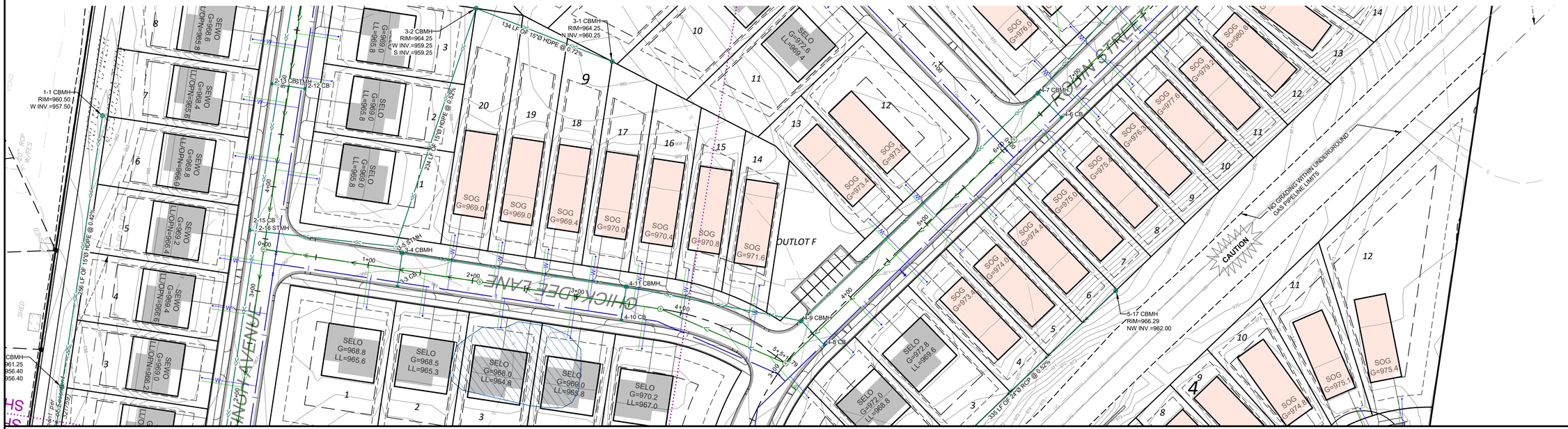
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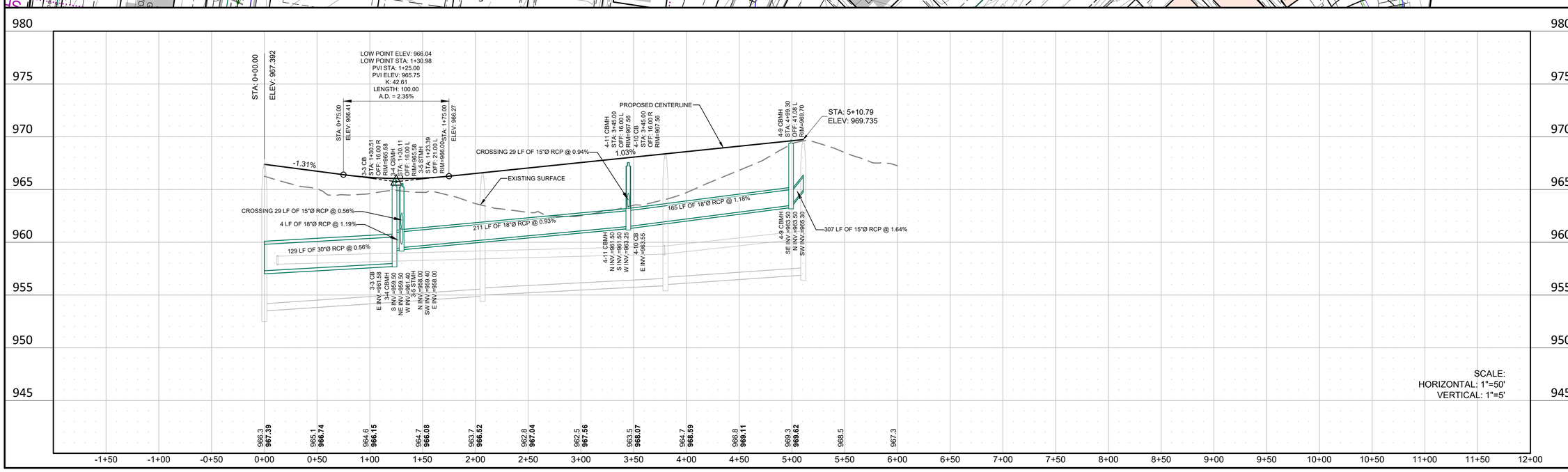
LEGEND:

- PROPOSED RIP RAP
- PROPOSED CONTOUR
- PROPOSED STORM SEWER
- PROPOSED WATER LINE
- PROPOSED SANITARY SEWER
- PROPOSED WATER SERVICE
- PROPOSED SANITARY SERVICE
- PROPOSED CATCH BASIN
- PROPOSED FLARED END SECITON
- PROPOSED STORM MANHOLE
- PROPOSED GATE VALVE & BOX
- PROPOSED HYDRANT
- PROPOSED SANITARY MANHOLE

0 50'

SCALE: 1" = 50'





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13076 FIRST STREET, BECKER, MN 55308-9322
TEL: 763.262.9282 FAX: 763.262.9844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

STREET & STORM-CHICKADEE LANE

SHEET NO.

C5.7

12/24/2024 10:47 AM n:\projects current\21-0300.00 tamarack monticello watson\Civil\cad files\Utility Profiles.dwg

LEGEND:

- PROPOSED RIP RAP
- 984 — PROPOSED CONTOUR
- >> — PROPOSED STORM SEWER
- — PROPOSED WATER LINE
- — PROPOSED SANITARY SEWER
- W — PROPOSED WATER SERVICE
- S — PROPOSED SANITARY SERVICE
- PROPOSED CATCH BASIN
- PROPOSED FLARED END SECITON
- D — PROPOSED STORM MANHOLE
- PROPOSED GATE VALVE & BOX
- PROPOSED HYDRANT
- S — PROPOSED SANITARY MANHOLE

0 50'

SCALE: 1" = 50'

REV NO.	DATE	DESCRIPTION
-	09/07/2022	DRAWINGS ISSUED TO CITY
1	09/19/2022	REVISED PER PUD REVIEW
2	07/26/2024	UPDATED WITH NEW LAYOUT
3	12/11/2024	REVISED PER CITY COMMENTS

DATE: 12/11/2024
DESIGN BY: MJM
DRAWN BY: MJM
CHECKED BY: CJD
DWG FILE: GRADING
FILE NO.: 21-0300.00

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.

Signed: _____ Lic. No. _____
Date: _____

BOGART, PEDERSON & ASSOCIATES, INC.
LAND SURVEYING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES
13076 FIRST STREET BECKER, MN 55308-9322
TEL: 763-262-9822 FAX: 763-262-9844

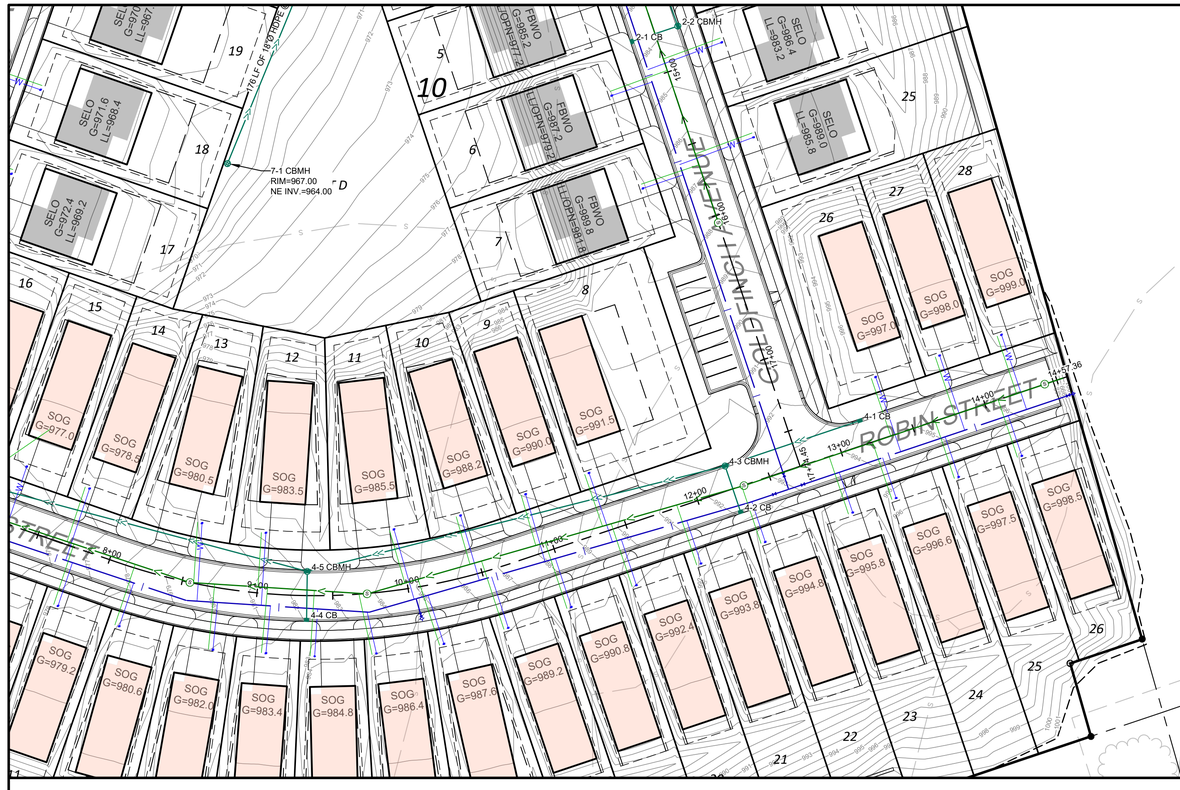
MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

STREET & STORM-ROBIN STREET

SHEET NO.
C5.8

SCALE:
HORIZONTAL: 1"=50'
VERTICAL: 1"=5'

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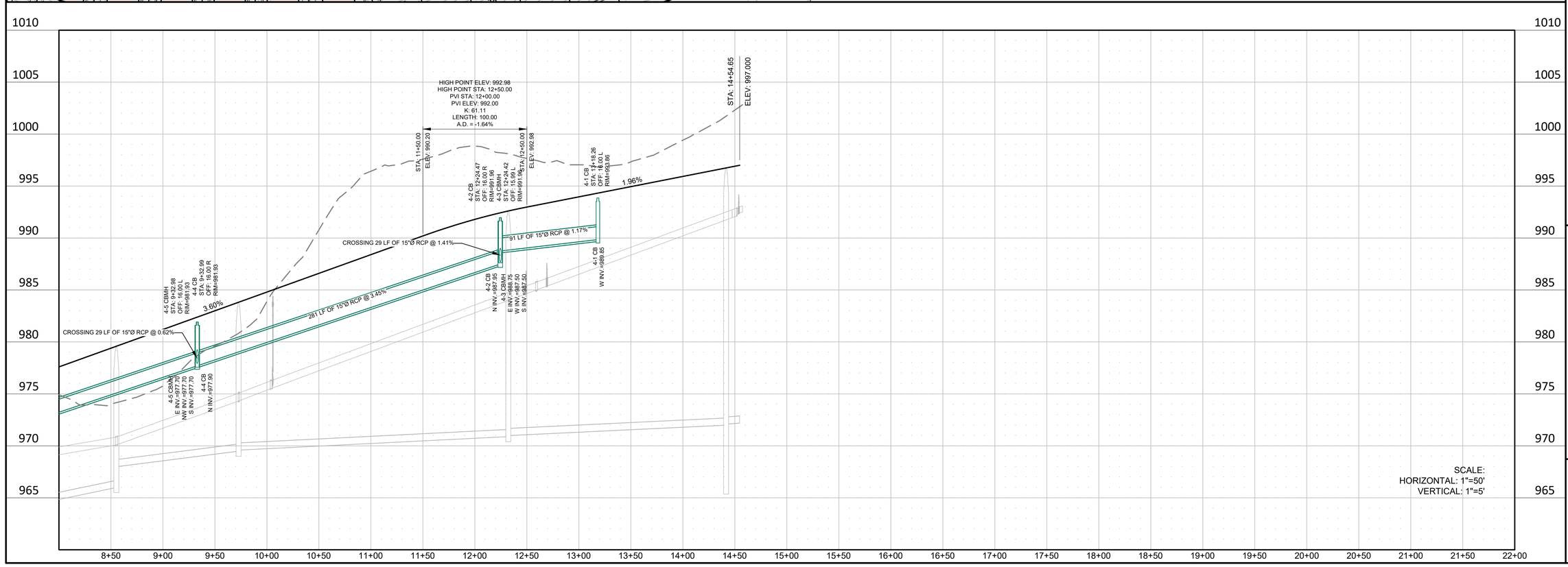


LEGEND:

- PROPOSED RIP RAP
- 984 PROPOSED CONTOUR
- PROPOSED STORM SEWER
- PROPOSED WATER LINE
- PROPOSED SANITARY SEWER
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- S PROPOSED SANITARY SERVICE
- PROPOSED CATCH BASIN
- PROPOSED FLARED END SECITON
- D PROPOSED STORM MANHOLE
- PROPOSED GATE VALVE & BOX
- PROPOSED HYDRANT
- S PROPOSED SANITARY MANHOLE

0 50'

SCALE: 1" = 50'



SCALE:
HORIZONTAL: 1"=50'
VERTICAL: 1"=5'

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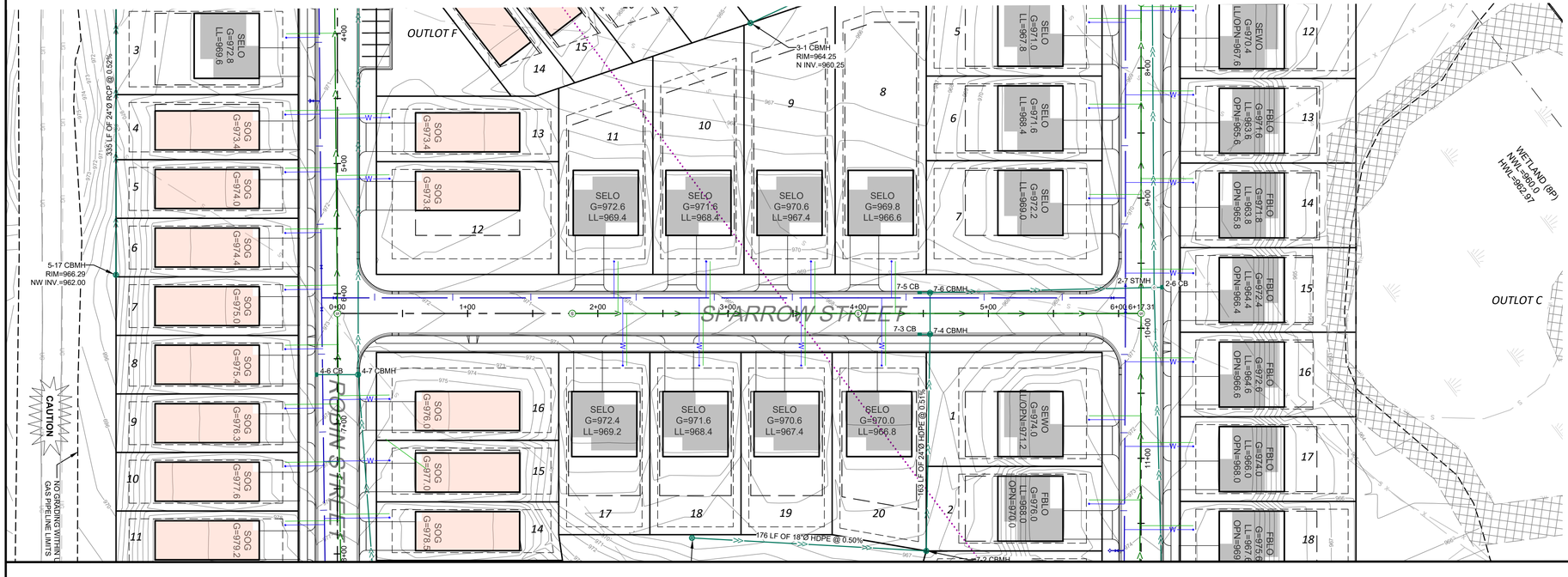
MEADOWS AT PIONEER PARK
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City of Monticello, Wright County, MN

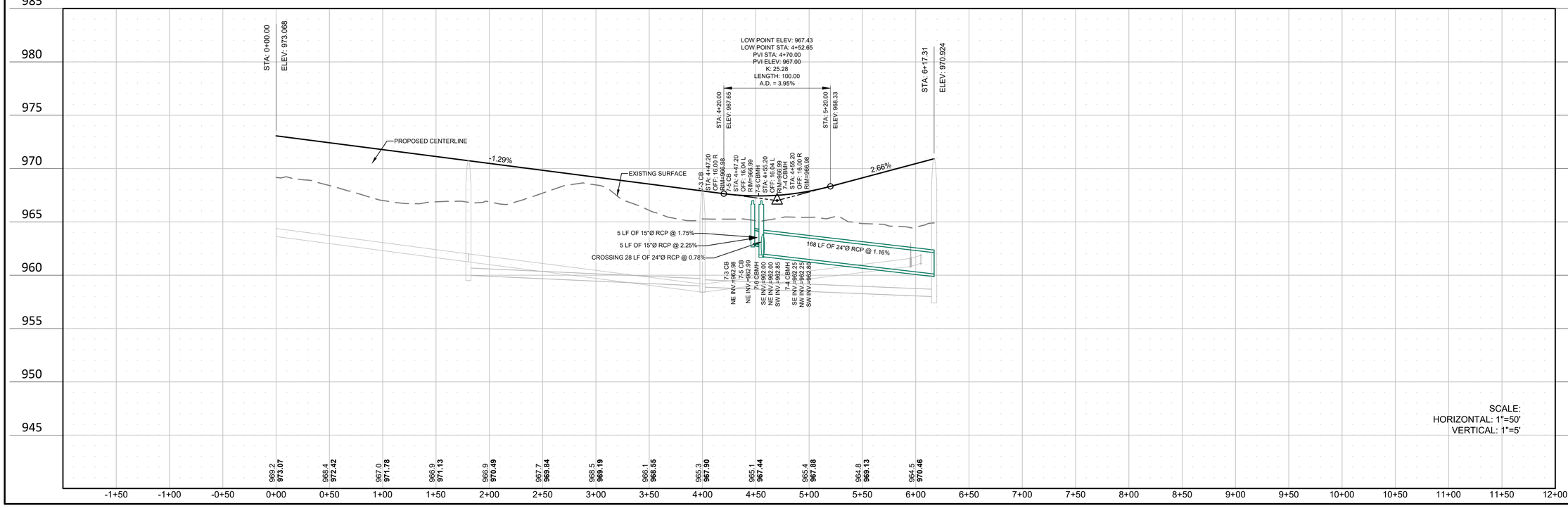
STREET & STORM-ROBIN STREET (2)

SHEET NO.

C5.9

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13179 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-9822 FAX: 763-262-9844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

STREET & STORM-SPARROW STREET

SHEET NO.
C5.10

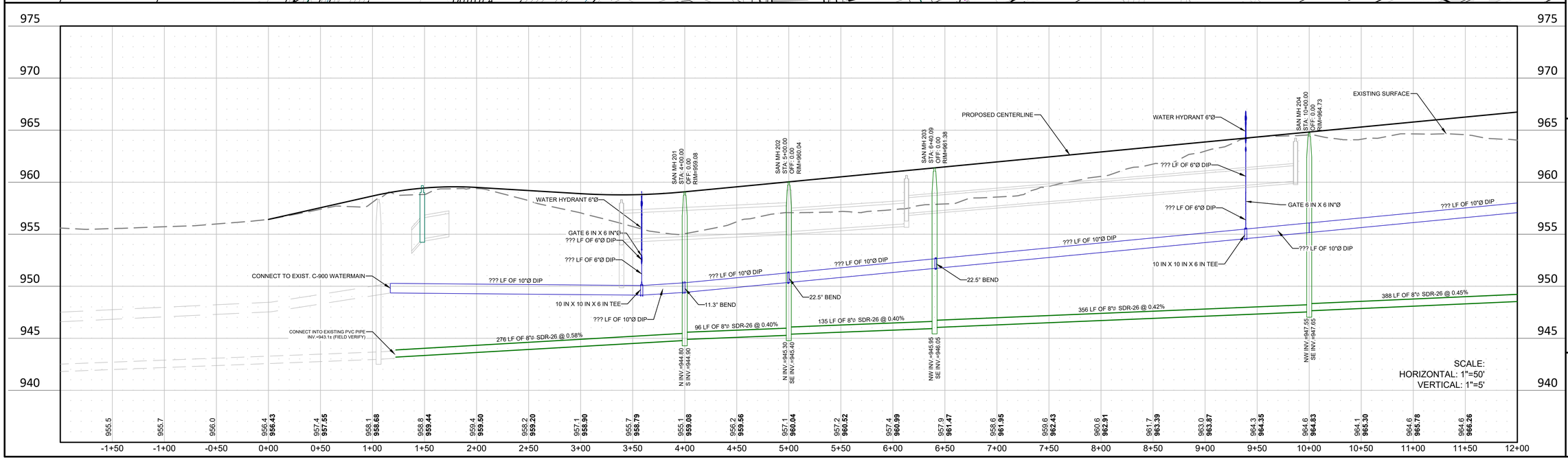
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LEGEND:

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- 984 — PROPOSED CONTOUR
- >> — PROPOSED STORM SEWER
- I — PROPOSED WATER LINE
- > — PROPOSED SANITARY SEWER
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- S — PROPOSED SANITARY SERVICE
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- PROPOSED FLARED END SECITON
- D — PROPOSED STORM MANHOLE
- PROPOSED GATE VALVE & BOX
- PROPOSED HYDRANT
- S — PROPOSED SANITARY MANHOLE

0 50'
SCALE: 1" = 50'

OUTLOT B
WETLAND (3P)
NWL=955.0
HWL=959.12
PONDING
NWL=955.0
HWL=959.12
20 C.Y. OF CL. 3 RIP RAP IN FOREBAY
16 C.Y. OF CL. 3 RIP RAP IN FOREBAY
OUTLOT A
Northern Natural Gas Pipeline
CAUTION
NO GRADING WITHIN UNDERGROUND GAS PIPELINE LIMITS
FALLON DRIVE NE
FALCON DRIVE NE
CONNECT TO EXIST. 10" WATERMAIN STUB REMOVE EX. HYDRANT.
CONNECT INTO EXISTING PVC PIPE INV.=943.1± (FIELD VERIFY)
WATER HYDRANT 6"Ø
??? LF OF 6"Ø DIP
6 IN X 6 IN GATE VALVE
10 IN X 10 IN X 6 IN TEE
11.3° BEND
22.5° BEND
4+ SAN MH 201
5+ SAN MH 202
6+ SAN MH 203
7+ SAN MH 204
10 IN X 10 IN GATE VALVE
8 IN X 8 IN GATE VALVE
EXTEND SERVICES TO EXISTING PROPERTY
DETACHED GARAGE
SEWO G=964.0 LL/OPN=961.2
SEWO G=964.4 LL/OPN=961.8
SEWO G=964.8 LL/OPN=962.0
SEWO G=965.6 LL/OPN=962.8
SEWO G=963.2 LL/OPN=960.4
SEWO G=963.6 LL/OPN=960.8
SEWO G=964.2 LL/OPN=961.4
SEWO G=963.4 LL/OPN=962.6
SELO G=966.4 LL=963.2
SELO G=967.0 LL=963.8
SELO G=967.5 LL=964.3
SELO G=968.2 LL=965.0
SELO G=968.8 LL=965.6
SELO G=969.2 LL=966.0
SELO G=969.0 LL=965.8
SELO G=968.6 LL=965.4
SELO G=969.0 LL=964.8
SELO G=967.0 LL=963.8
SELO G=966.6 LL=963.4
SELO G=966.0 LL=962.8



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13076 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-9822 FAX: 763-262-9844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

WATER & SANI-FALLON DRIVE NE (1)

SHEET NO.
C6.1

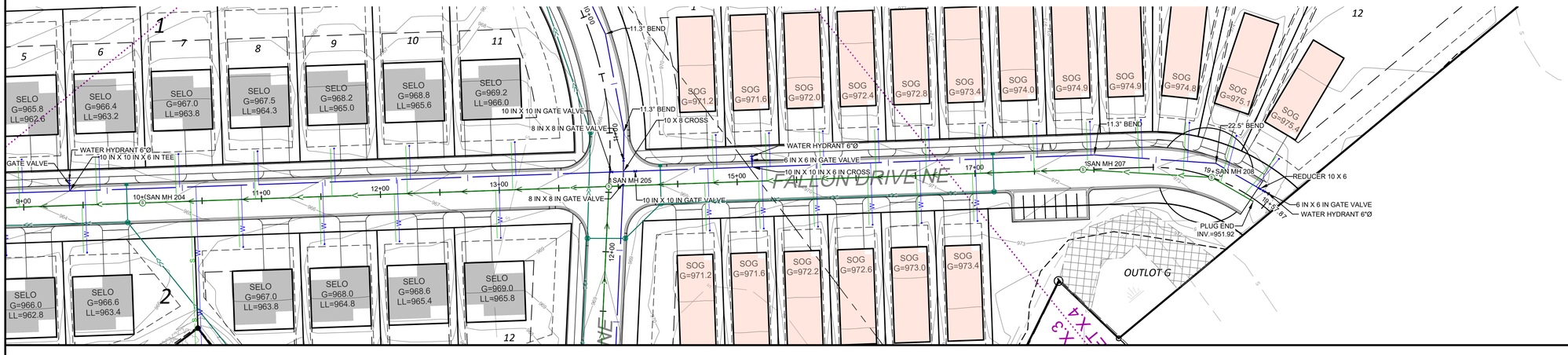
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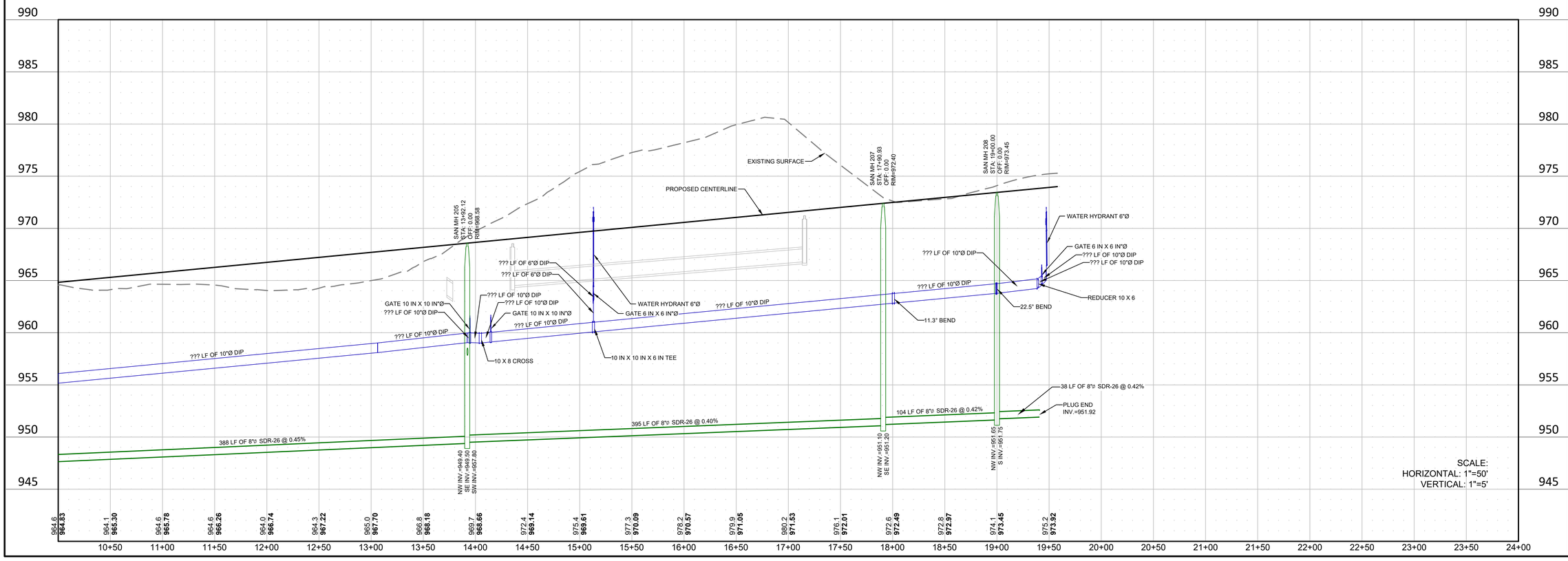
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- 984 — PROPOSED CONTOUR
- >> — PROPOSED STORM SEWER
- I — PROPOSED WATER LINE
- > — PROPOSED SANITARY SEWER
- W — PROPOSED WATER SERVICE
- S — PROPOSED SANITARY SERVICE
- PROPOSED CATCH BASIN
- PROPOSED FLARED END SECITON
- D — PROPOSED STORM MANHOLE
- PROPOSED GATE VALVE & BOX
- PROPOSED HYDRANT
- S — PROPOSED SANITARY MANHOLE

0 50'

SCALE: 1" = 50'





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TEL: 763-262-4822 | FAX: 763-262-4844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

WATER & SANI-FALLON DRIVE NE (2)

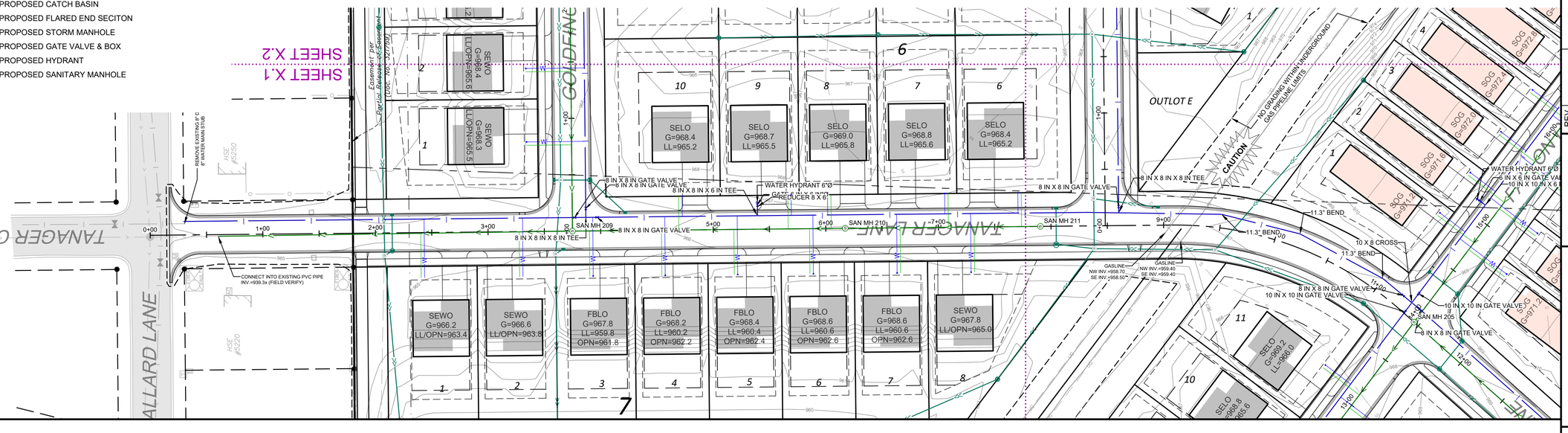
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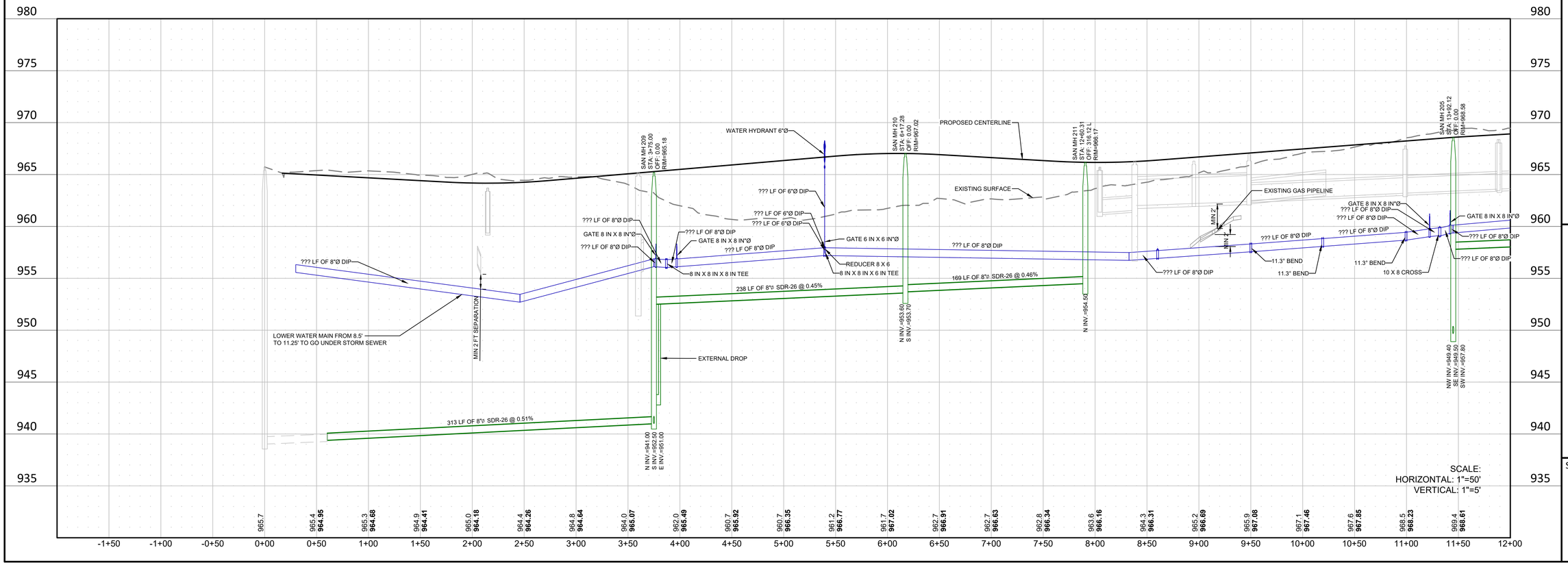
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LEGEND:

- PROPOSED RIP RAP
- PROPOSED CONTOUR
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- PROPOSED SANITARY SEWER
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1307B FIRST STREET, BECKER, MN 55308-9322
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MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

WATER & SANI-TANAGER LANE (1)

SHEET NO.
C6.3

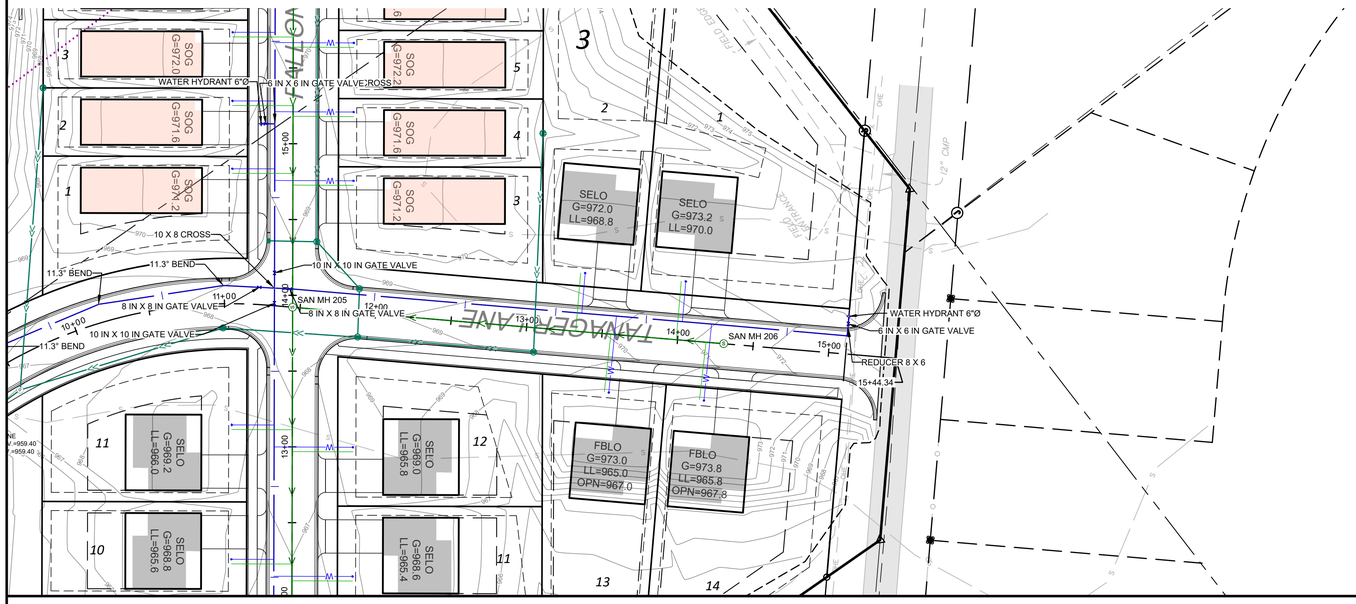
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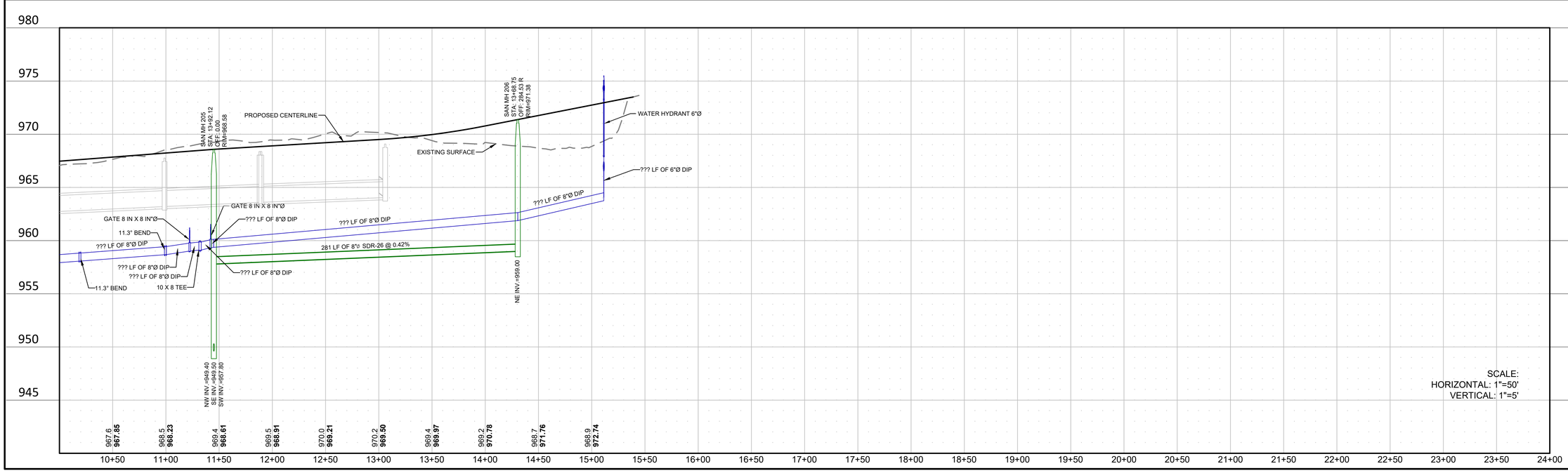
LEGEND:

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0 50'

SCALE: 1" = 50'





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TEL 763-262-9822 FAX 763-262-9844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

WATER & SANI-TANAGER LANE (2)

SHEET NO.

C6.4

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LEGEND:

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- PROPOSED CONTOUR
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SCALE: 1" = 50'

GOLDFINCH AVENUE

TANAGER LANE

CHICKADEE LANE

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MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC

City of Monticello, Wright County, MN

WATER & SANI-GOLDFINCH AVENUE (1)

SHEET NO.

C6.5

SCALE:
HORIZONTAL: 1"=50'
VERTICAL: 1"=5'

12/4/2024 10:52 AM n:\projects current\21-0300.00 tamarack- monticello mdeon\Civil\cad files\Utility Profiles.dwg

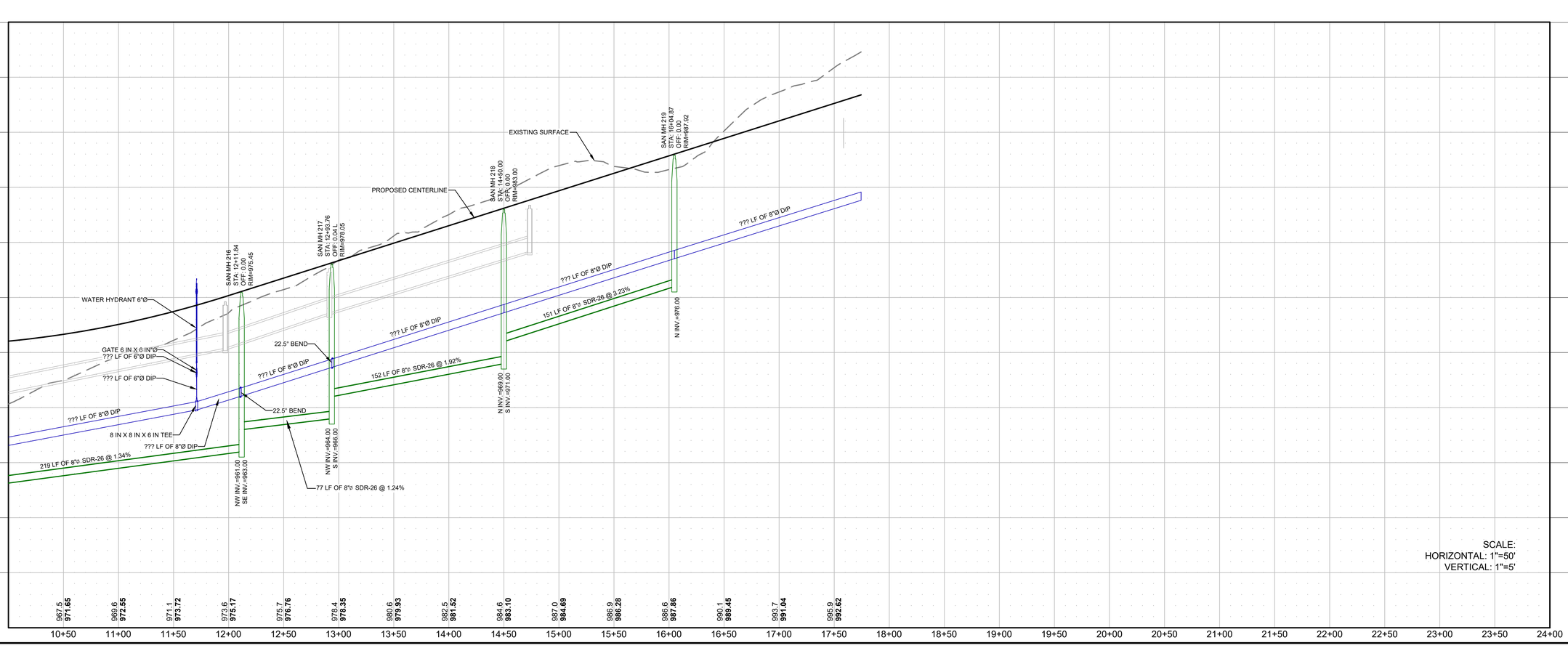


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0 50'

SCALE: 1" = 50'



SCALE:
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City of Monticello, Wright County, MN

WATER & SANI-GOLDFINCH AVENUE (2)

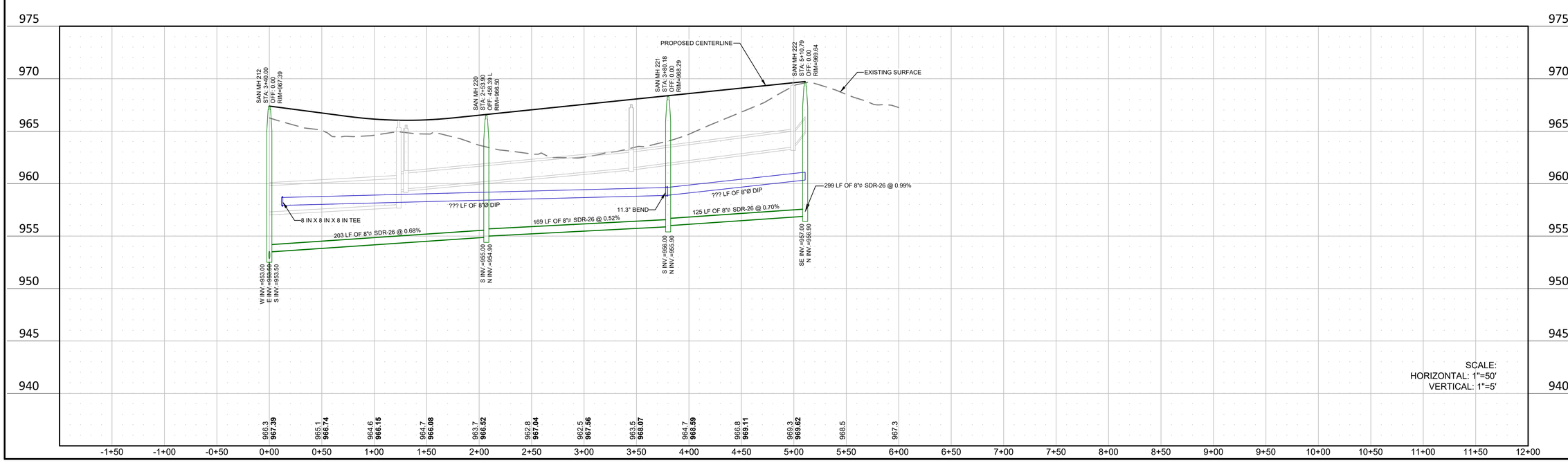
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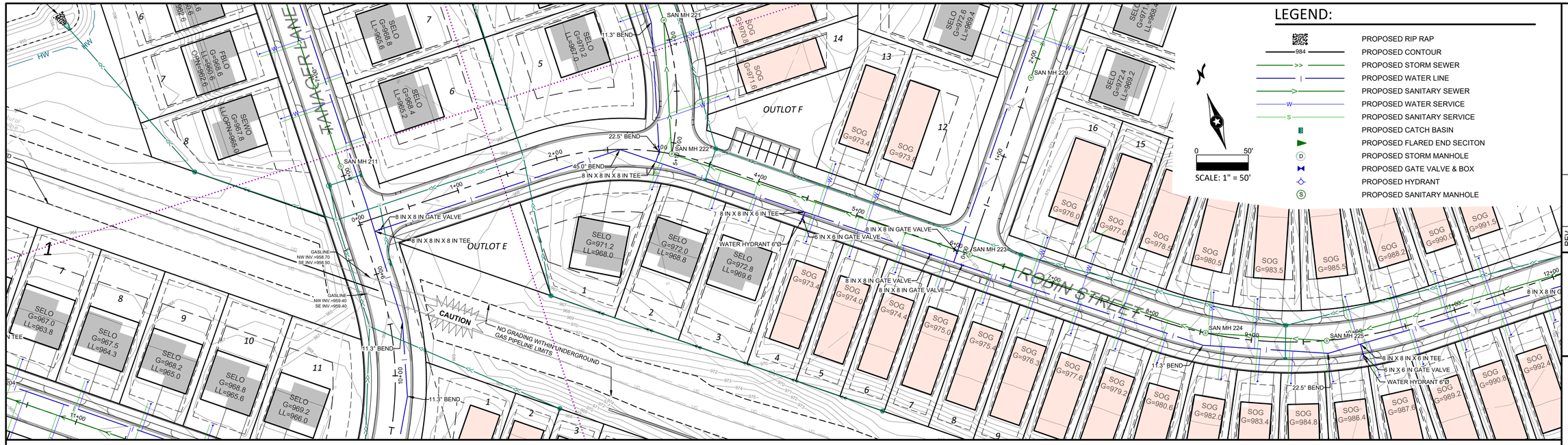
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13179 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-9822 FAX: 763-262-9844

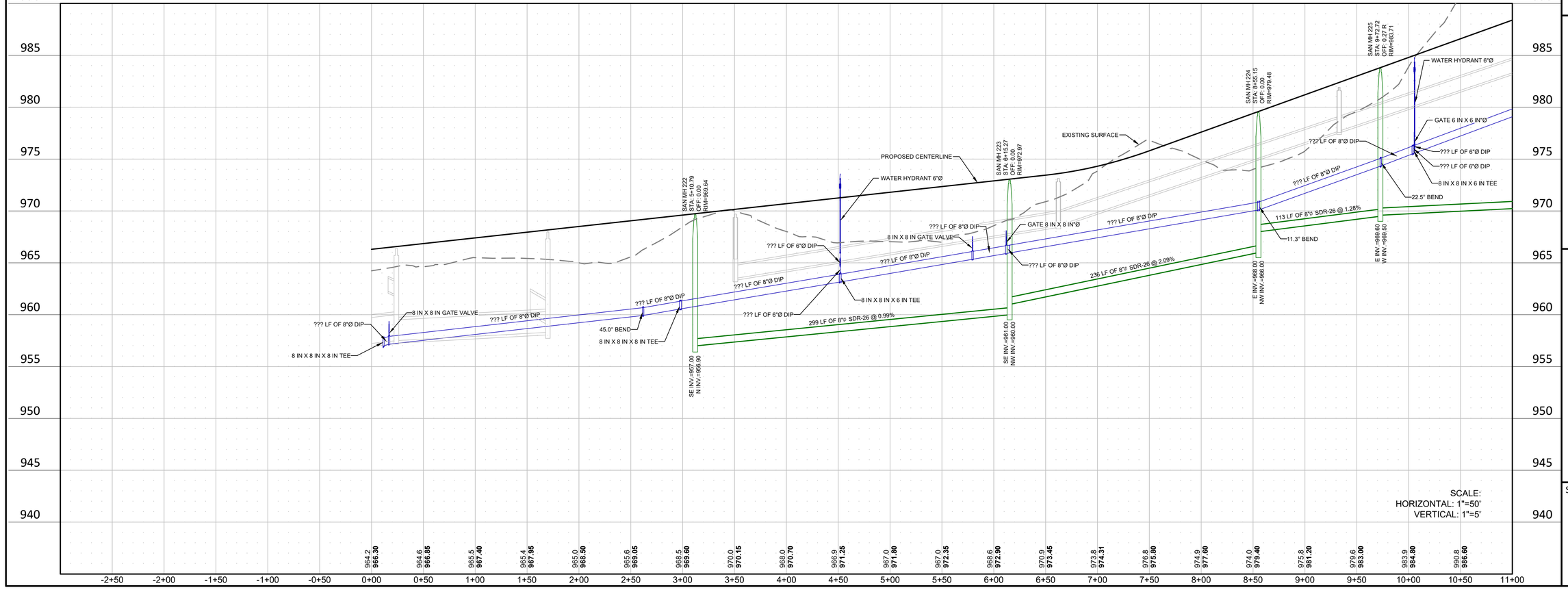
MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

WATER & SANI-CHICKADEE LANE

SHEET NO.
C6.7

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REV NO.	DATE	DESCRIPTION
-	06/07/2022	DRAWINGS ISSUED TO CITY
1	09/19/2022	REVISED PER PUD REVIEW
2	07/26/2024	UPDATED WITH NEW LAYOUT
3	12/11/2024	REVISED PER CITY COMMENTS

DATE: 12/11/2024
DESIGN BY: MJM
DRAWN BY: MJM
CHECKED BY: CJD
DWG FILE: GRADING
FILE NO.: 21-0300.00

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.

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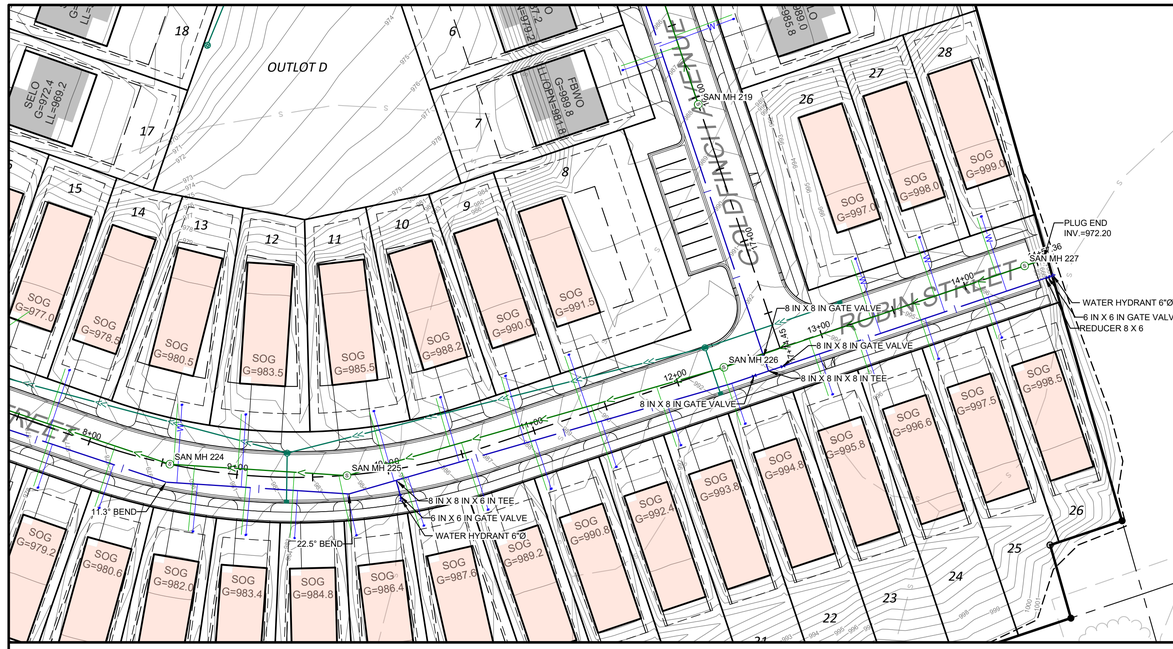
BOGART, PEDERSON & ASSOCIATES, INC.
LAND SURVEYING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES
13076 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-9282 FAX: 763-262-9844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

WATER & SANI-ROBIN STREET

SHEET NO.
C6.8

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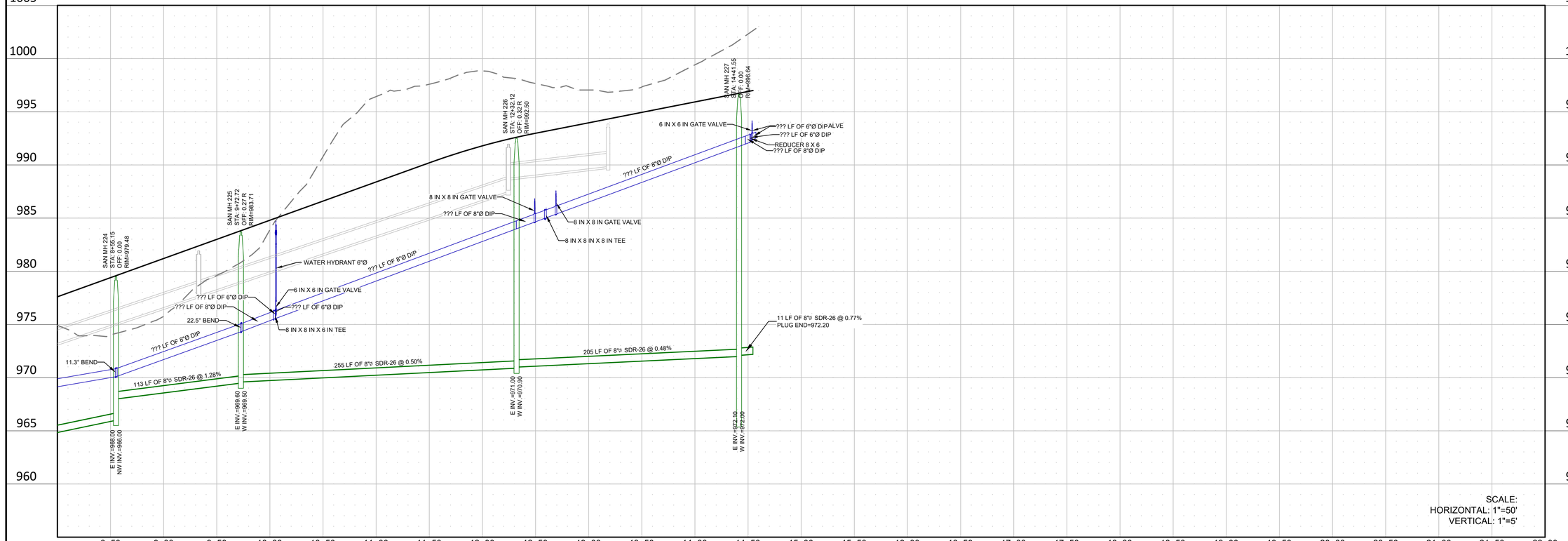


LEGEND:

- PROPOSED RIP RAP
- 984 PROPOSED CONTOUR
- PROPOSED STORM SEWER
- PROPOSED WATER LINE
- PROPOSED SANITARY SEWER
- PROPOSED WATER SERVICE
- PROPOSED SANITARY SERVICE
- PROPOSED CATCH BASIN
- PROPOSED FLARED END SECITON
- PROPOSED STORM MANHOLE
- PROPOSED GATE VALVE & BOX
- PROPOSED HYDRANT
- PROPOSED SANITARY MANHOLE

0 50'

SCALE: 1" = 50'



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TEL: 763-262-3822 FAX: 763-262-3844

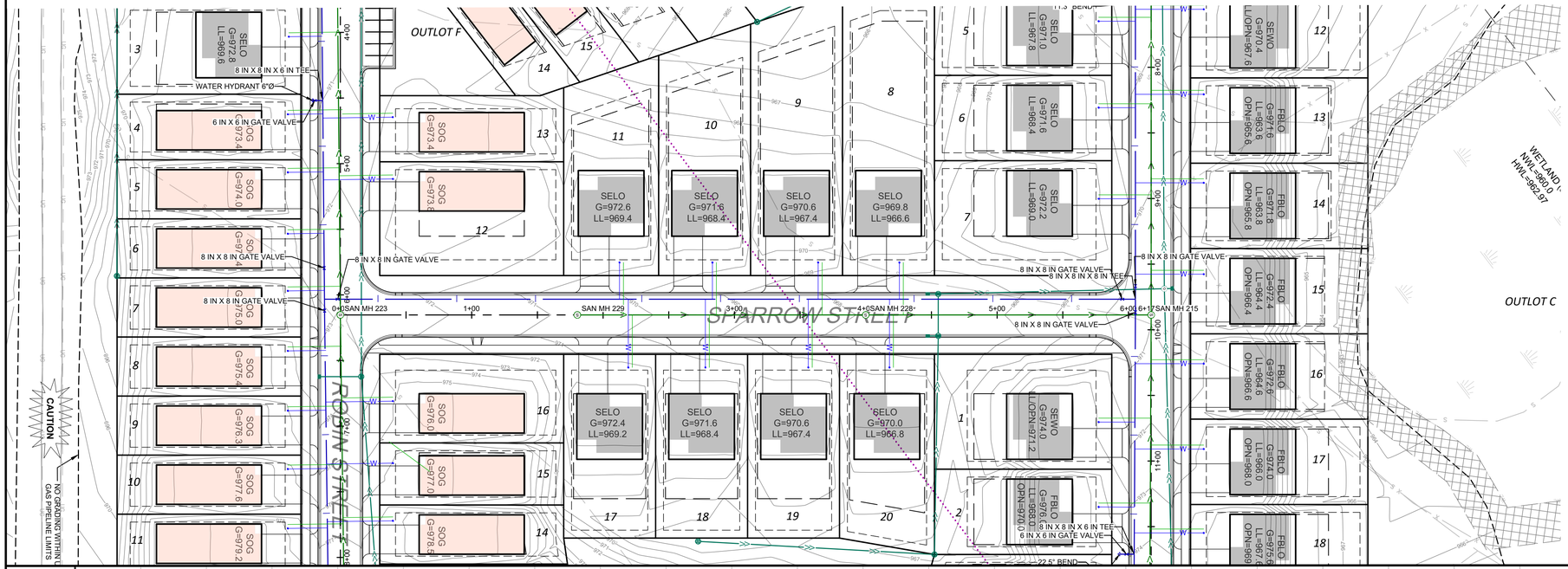
MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

WATER & SANI-ROBIN SANI (2)

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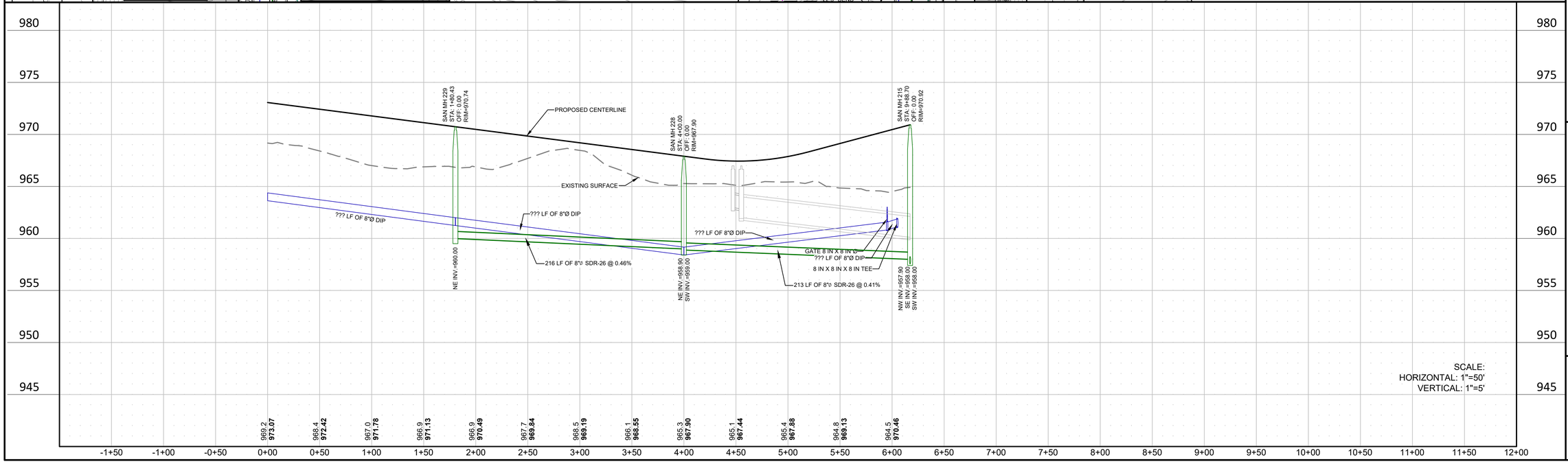
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LEGEND:

- PROPOSED RIP RAP
- 984 — PROPOSED CONTOUR
- >> — PROPOSED STORM SEWER
- I — PROPOSED WATER LINE
- > — PROPOSED SANITARY SEWER
- W — PROPOSED WATER SERVICE
- S — PROPOSED SANITARY SERVICE
- PROPOSED CATCH BASIN
- PROPOSED FLARED END SECITON
- D — PROPOSED STORM MANHOLE
- PROPOSED GATE VALVE & BOX
- PROPOSED HYDRANT
- S — PROPOSED SANITARY MANHOLE



SCALE:
HORIZONTAL: 1"=50'
VERTICAL: 1"=5'

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13079 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-5822 FAX: 763-262-5844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

WATER & SANI-SPARROW STREET

SHEET NO.
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EROSION CONTROL NOTES:

1. CONTRACTOR SHALL CONFINE CONSTRUCTION OPERATIONS TO THE CONSTRUCTION/GRADING LIMITS SHOWN.
2. ALL WORK SHALL CONFORM TO THE MINNESOTA POLLUTION CONTROL AGENCY'S STORM WATER PERMIT REQUIREMENTS. CONTRACTOR SHALL OBTAIN ALL PERMITS AND COMPLY WITH ALL PERMIT REQUIREMENTS.
3. THE SITE SOIL EROSION AND SEDIMENT CONTROL FACILITIES SHALL BE INSTALLED PRIOR TO ANY DEMOLITION OR GRADING OPERATIONS AND MAINTAINED TO CONFORM WITH THE STANDARDS SPECIFIED BY THE PERMIT.
4. CONTRACTOR SHALL INSPECT TEMPORARY EROSION CONTROL MEASURES ON THE ENTIRE SITE AT LEAST EVERY 7 DAYS AND WITHIN 24 HOURS OF ANY MEASURABLE RAINSTORM. DAMAGED SILT FENCE OR OTHER EROSION CONTROL DEVICES OR PRACTICES SHALL BE REPAIRED IMMEDIATELY. INSPECTION AND MAINTENANCE OF DEVICES SHALL CONTINUE UNTIL THE SITE HAS UNDERGONE FINAL STABILIZATION AND A NOTICE OF TERMINATION IS SUBMITTED TO THE MPCA.
5. ALL GRADING OPERATIONS SHALL BE CONDUCTED IN A MANNER TO MINIMIZE THE POTENTIAL FOR SITE EROSION.
6. THE SITE SOIL EROSION AND SEDIMENT CONTROL FACILITIES SHALL BE INSTALLED AND MAINTAINED TO CONFORM WITH THE STANDARDS SPECIFIED BY THE CITY OF MONTICELLO AND THE MPCA.
7. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE DISTURBANCE OF ANY AREAS AND MAINTAINED UNTIL ALL TRIBUTARY DISTURBED AREAS ARE RESTORED.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL EROSION CONTROL MEASURES, INCLUDING SILT FENCE AND BALES, UPON ESTABLISHMENT OF PERMANENT VEGETATION IN SAID AREAS.
9. ALL SOILS TRACKED ONTO PAVEMENT OR ANY OTHER OFF-SITE AREA SHALL BE REMOVED DAILY.
10. THE SITE SEDIMENT CONTROL FACILITIES FOR THE PROJECT MUST BE INSTALLED PRIOR TO ANY GRADING OPERATION.
11. ALL AREAS DISTURBED DURING CONSTRUCTION SHALL BE RESTORED AND VEGETATED AS SOON AS POSSIBLE. ANY FINISHED AREAS SHALL BE SEEDED AND MULCHED WITHIN 7 DAYS AFTER FINISHED GRADING IS COMPLETED IN ACCORDANCE TO MN/DOT 2575.
12. ALL DISTURBED AREAS SHALL BE REVEGETATED WITH MN/DOT SEED MIX, MULCHED, FERTILIZED & DISK ANCHORED, PER THE FOLLOWING SCHEDULE:

SEED MIX 25-131:	220 LB/AC.
FERTILIZER 22-5-10:	350 LB/AC.
MULCH TYPE 3:	2 TONS/AC.

13. CONTRACTOR SHALL INSTALL TEMPORARY SEDIMENT BMP'S SHOWN AND NOT SHOWN ON PLANS DURING PHASING ON PROJECT TO COMPLY WITH MPCA, CITY INSPECTOR AND DEVELOPER REQUEST
14. INSTALL SILT FENCE AROUND PONDS AS SOON AS POSSIBLE AFTER GRADING.
15. SEE WETLAND BUFFER REVEGETATION PLAN FOR WETLAND BUFFER SEEDING AREA.

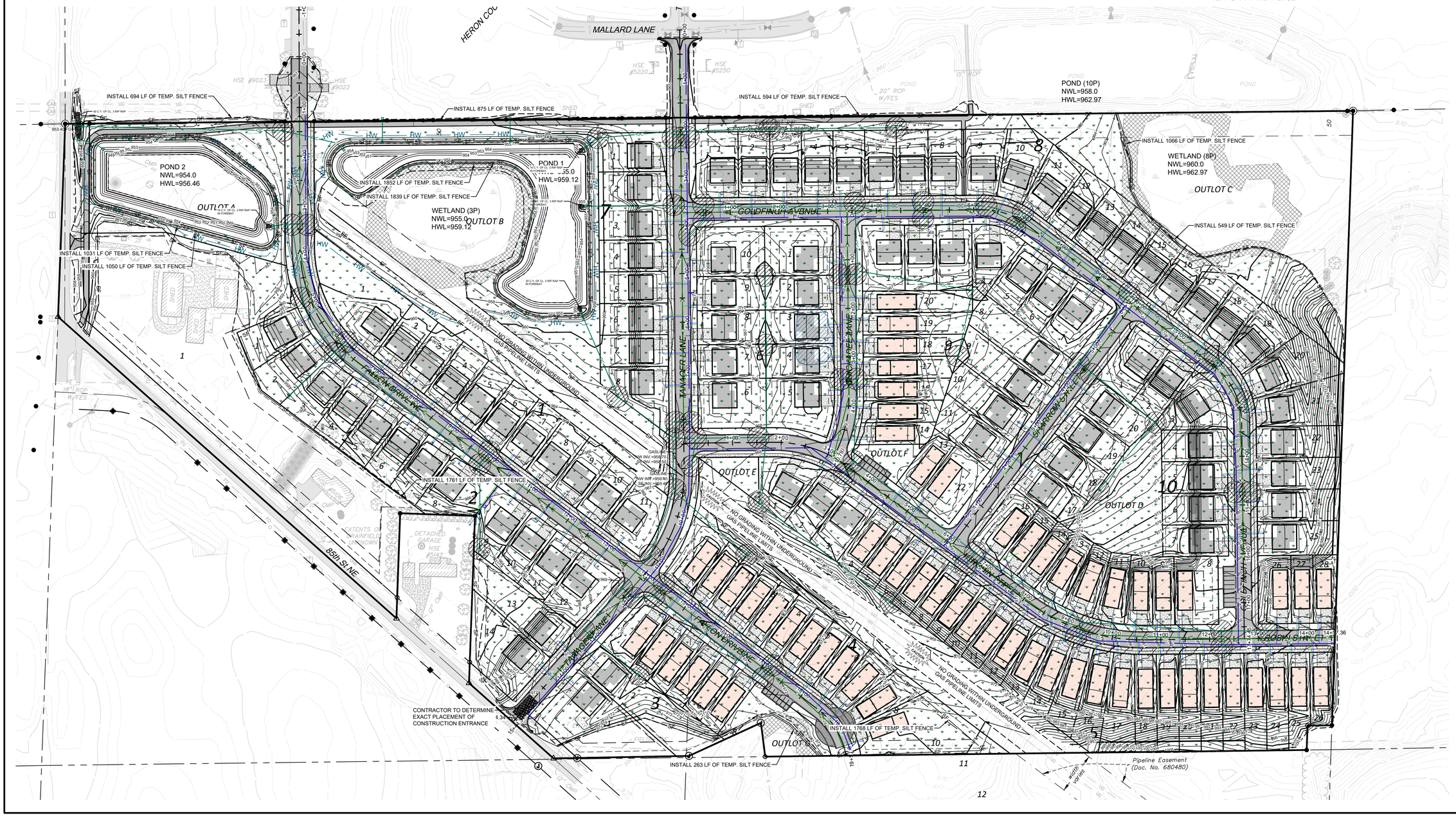
LEGEND:

- TEMPORARY ROCK CONSTRUCTION ENTRANCE
- EROSION CONTROL BLANKET (PER DETAIL)
- TURF ESTABLISHMENT SEEDING
- FIBER-LOG ROLLS
- PROPOSED RIP RAP
- 984 — PROPOSED CONTOUR
- E.O.F. — EMERGENCY OVERFLOW
- TEMPORARY SEDIMENT FILTER- HIGH FLOW
- SF — GRADING LIMITS AND PROPOSED TEMPORARY SILT FENCE

N

0 100'

SCALE: 1" = 100'



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CHECKED BY: CJD
DWG FILE: EROSION
FILE NO.: 21-0300.00

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CIVIL ENGINEERING
ENVIRONMENTAL SERVICES
13076 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-9622 FAX: 763-262-9644

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

EROSION CONTROL PLAN

SHEET NO.

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SEEDING & MAINTENANCE (PER MNDOT):

ALL DISTURBED AREAS SHALL BE REVEGETATED WITH MN/DOT SEED MIX, MULCHED, FERTILIZED & DISK ANCHORED, PER THE FOLLOWING SCHEDULE:

STANDARD SEED MIX 25-131:	220 LB/AC.
WETLAND BUFFER SEED MIX: 34-261	31.5 LB/AC
FERTILIZER 22-5-10:	350 LB/AC.
MULCH TYPE 3:	2 TONS/AC.
POND SEED MIX 33-261:	35 LB/AC.

SEEDING
A) SITE PREPARATION - THE SITE SHOULD BE PREPARED BY LOOSENING TOPSOIL TO A MINIMUM DEPTH OF 3 INCHES.
B) FERTILIZER – USE A FERTILIZER ANALYSIS BASED ON A SOIL TEST OR A GENERAL RECOMMENDATION IS A 10-10-10 (NPK) COMMERCIAL GRADE ANALYSIS AT 200 LBS/ACRE.
C) SEED INSTALLATION - SEED SHOULD BE INSTALLED WITH A DROP SEEDER THAT WILL ACCURATELY METER THE TYPES OF SEED TO BE PLANTED, KEEP ALL SEEDS UNIFORMLY MIXED DURING THE SEEDING AND CONTAIN DROP SEED TUBES FOR SEED PLACEMENT (BRILLION-TYPE). THE DROP SEEDER SHOULD BE EQUIPPED WITH A CULTIPACKER ASSEMBLY TO ENSURE SEED-TO-SOIL CONTACT.
D) SEEDING RATES - RATES ARE SPECIFIED IN THE MIXTURE TABULATION FOR THE SPECIFIED MIX.
E) PACKING – IF THE DROP SEEDER IS NOT EQUIPPED WITH A CULTIPACKER, THE SITE SHOULD BE CULTIPACKED FOLLOWING THE SEEDING TO ENSURE SEED-TO-SOIL CONTACT.
F) MULCH - THE SITE SHOULD BE MULCHED AND DISC-ANCHORED FOLLOWING CULTIPACKING. THE STANDARD MULCH IS MN/DOT TYPE 1 AT A RATE OF 2.0 TONS/ACRE. ALSO SEE TEMPORARY EROSION CONTROL FOR ADDITIONAL INFORMATION.

SEED MIXTURE MAINTENANCE (25-131)
YEAR 1
1) PROVIDE WATER IF NECESSARY TO AID ESTABLISHMENT
2) AFTER TURF GRASSES REACH A HEIGHT OF 6 INCHES, INITIALLY MOW TO A HEIGHT OF 2 TO 3 INCHES.
LONG TERM
1) FERTILIZE AND WATER AS NEEDED.
2) MOW A MINIMUM OF ONCE EVERY 2 WEEKS.

NATIVE GRASS AND FORB MIXTURES (33-261)
YEAR 1
ESTABLISHMENT (SPRING SEEDING):
1) PREPARE SITE - LATE APRIL - MAY.
2) SEED - MAY 1 – JUNE 1.

MAINTENANCE:
1) MOW (6-8 INCHES) – EVERY 30 DAYS AFTER PLANTING UNTIL SEPTEMBER 30.
2) WEED CONTROL - MOWING SHOULD HELP CONTROL ANNUAL WEEDS. SPOT SPRAY THISTLES ETC.
ESTABLISHMENT (FALL SEEDING):
1) PREPARE SITE - LATE AUGUST - EARLY SEPTEMBER.
2) SEED - LATE SEPTEMBER TO FREEZE-UP.
MAINTENANCE (FOLLOWING SEASON):
1) MOW (6-8 INCHES) – ONCE IN MAY, JUNE AND JULY.
2) WEED CONTROL - MOWING SHOULD KEEP ANNUAL WEEDS DOWN. SPOT SPRAY THISTLES ETC.
EVALUATION:
1) COVER CROP GROWING WITHIN 2 WEEKS OF PLANTING (EXCEPT DORMANT PLANTINGS).
2) SEEDLINGS SPACED 1-6 INCHES APART IN DRILL ROWS.
3) NATIVE GRASS SEEDLINGS MAY ONLY BE 4-6 INCHES TALL.
4) IF THERE IS A FLUSH OF GROWTH FROM FOXTAIL ETC., MOW AS NECESSARY.
YEAR 2
MAINTENANCE:
1) MOW (6-8 INCHES) ONE TIME BETWEEN JUNE 1 - AUGUST 15 BEFORE WEEDS SET SEED.
2) WEED CONTROL - MOWING SHOULD KEEP ANNUAL WEEDS DOWN. SPOT SPRAY THISTLES ETC.
3) SOME SITES MAY NOT REQUIRE MUCH MAINTENANCE THE SECOND YEAR.
EVALUATION:
1) COVER CROP WILL BE GONE UNLESS WINTER WHEAT WAS USED IN A FALL PLANTING.
2) GRASSES FORMING CLUMPS 1-6 INCHES APART IN DRILL ROWS, BUT STILL SHORT.
3) SOME FLOWERS SHOULD BE BLOOMING (BLACK-EYED SUSANS, BERGAMOT ETC.).
4) IF THERE IS A FLUSH OF GROWTH FROM FOXTAIL ETC., MOW SITE.
YEAR 3
MAINTENANCE:
1) MOW ONLY IF NECESSARY.
3) WEED CONTROL - SPOT SPRAY THISTLES, ETC.
4) SITES USUALLY DO NOT REQUIRE MUCH MAINTENANCE THE THIRD YEAR.
EVALUATION:
1) PLANTING SHOULD BEGIN LOOKING LIKE A PRAIRIE - TALL GRASSES, FLOWERS ETC.
LONG-TERM
MAINTENANCE:
1) WEED CONTROL - SPOT SPRAY THISTLES ETC.
2) BURNING (3-5 YEAR ROTATION) ALTERNATE SPRING AND FALL IF POSSIBLE.
3) HAYING (3-5 YEAR ROTATION) LATE SUMMER OR EARLY FALL. ALTERNATE WITH BURN

ALL BUFFERS (NATURAL OR CREATED) MUST BE PROTECTED DURING CONSTRUCTION WITH EROSION CONTROL.

WHEN EXISTING VEGETATION IS NOT ACCEPTABLE FOR USE AS THE BUFFER, THEN A BUFFER MUST BE ESTABLISHED BY PLANTING. PLANTING MUST MEET THESE CRITERIA:
- PLANTING MUST BE IDENTIFIED ON THE WETLAND REPLACEMENT PLAN OR GRADING PLAN.
- PLANTING MUST BE DONE BY A QUALIFIED CONTRACTOR.
- INSTALL IN ACCORDANCE WITH MOST CURRENT BWSR GUIDANCE.
- REPLANT VEGETATION THAT IS UNSUCCESSFUL DURING THE FIRST TWO GROWING SEASONS.
- NO FERTILIZER MAY BE USED UNLESS PRESCRIBED BY ACCREDITED SOIL TESTING LAB.
- THE SEED PLANTED MUST BE:
  - A 100% NATIVE BWSR SEED MIX OR EQUIVALENT APPROVED BY PERMITTING AUTHORITIES, WITH THE EXCEPTION OF A 1-TIME ANNUAL NURSE OR COVER CROP SUCH AS OATS OR RYE.
  - OF LOCAL ECOTYPE ORIGINATING WITHIN 300 MILES.
- NATIVE TREES/SHRUBS MAY SUBSTITUTE FORBS AT 60 PER ACRE.

BUFFER MONUMENTS
BUFFERS SHALL BE ADEQUATELY MARKED WITH SIGNAGE AT A MAXIMUM 200 FT SPACING. SIGNS SHOULD BE ERECTED BEFORE OCCUPATION OF THE NEW DEVELOPMENTS. MONUMENT REQUIREMENTS CAN BE WAIVED WHERE THE PERMITTING AUTHORITY DEEMS THEY WOULD SERVE NO PRACTICAL PURPOSE.

BUFFER MAINTENANCE
FIRST TWO FULL GROWING SEASONS -
DURING FIRST TWO FULL GROWING SEASONS THE APPLICANT MUST REPLANT ANY VEGETATION THAT DOES NOT SURVIVE.
MUNICIPALITIES ARE ENCOURAGED TO CONSIDER BUFFER ESTABLISHMENT AND MANAGEMENT IN ESCROWS.

AFTER THE FIRST TWO FULL GROWING SEASONS -
AFTER THE FIRST TWO FULL GROWING SEASONS THE BUFFER MUST BE RESEEDED IF THE BUFFER CHANGES AT ANY TIME THROUGH HUMAN INTERVENTION OR ACTIVITIES.

EXISTING BUFFERS THAT HAVE ESTABLISHED PERENNIAL VEGETATION WITH CONTINUOUS COVER AND ARE FREE OF NOXIOUS WEEDS DO NOT HAVE TO RE-ESTABLISHED.

SEED MIX: 34-261 RIPARIAN SOUTH AND WEST (31.5 LB/AC)

LEGEND:

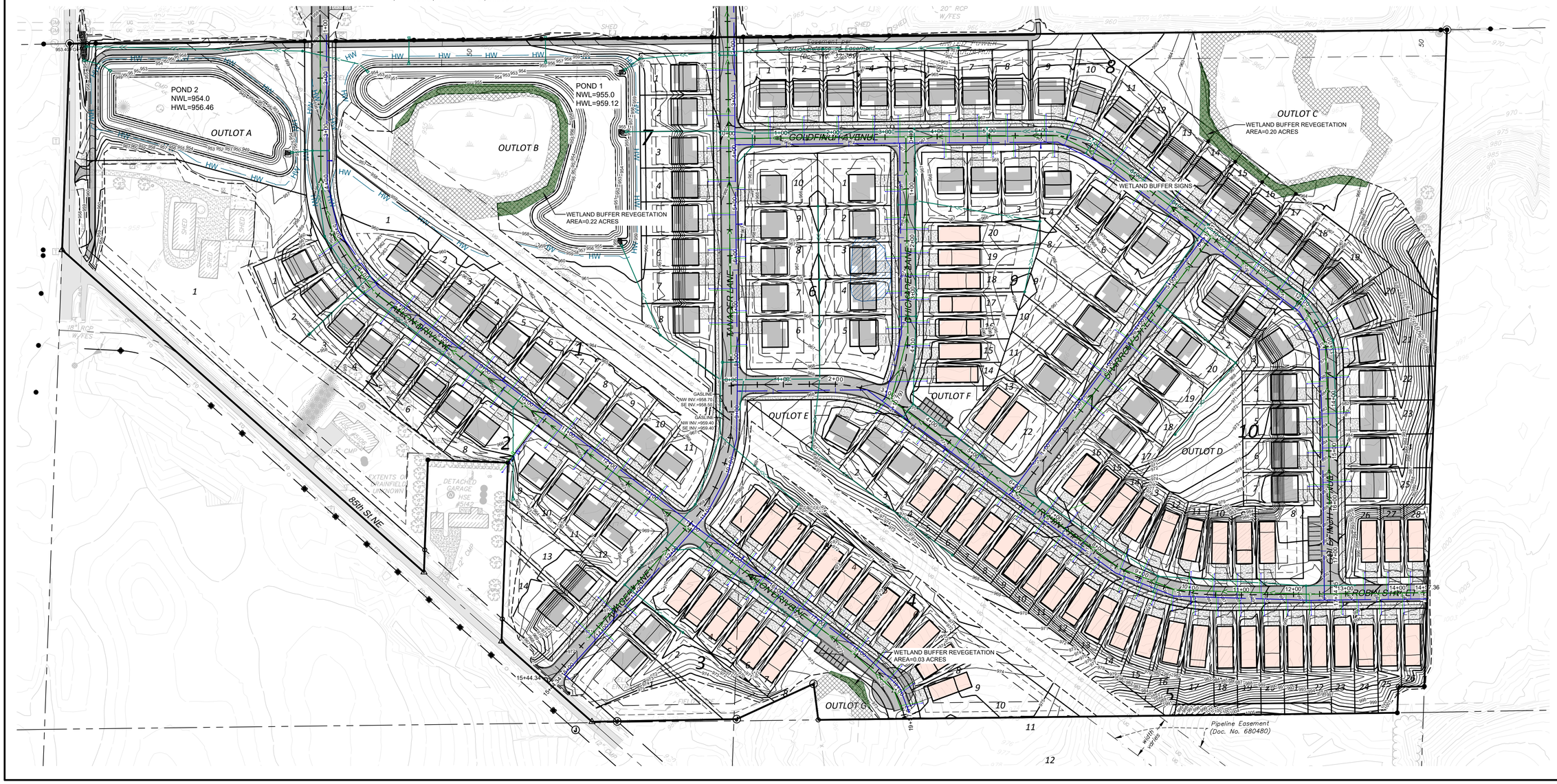
WETLAND BUFFER SEDING

WETLAND BUFFER SIGN

N

0 100'

SCALE: 1" = 100'



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CHECKED BY: CJD
DWG FILE: EROSION
FILE NO.: 21-0300.00

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Signed: _____ Lic. No. _____

Date: _____

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LAND SURVEYING
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ENVIRONMENTAL SERVICES
13076 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-0062 FAX: 763-262-0644

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

WETLAND BUFFER SEEDING

SHEET NO.
C7.1

12/4/2024 10:59 AM n:\projects current\21-0300.00 tamarack monticello nelson\Civil\xref files\Wetland Seeding.dwg

SCALE: 1" = 100'

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TEL: 763-262-9082 FAX: 763-262-9844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

OVERALL SIGN PLAN

SHEET NO.

C8.0

CALL 48 HOURS BEFORE DIGGING:
GOPHER STATE ONE CALL
TWIN CITY AREA 651-454-0002
MINNESOTA TOLL FREE 1-800-252-1166

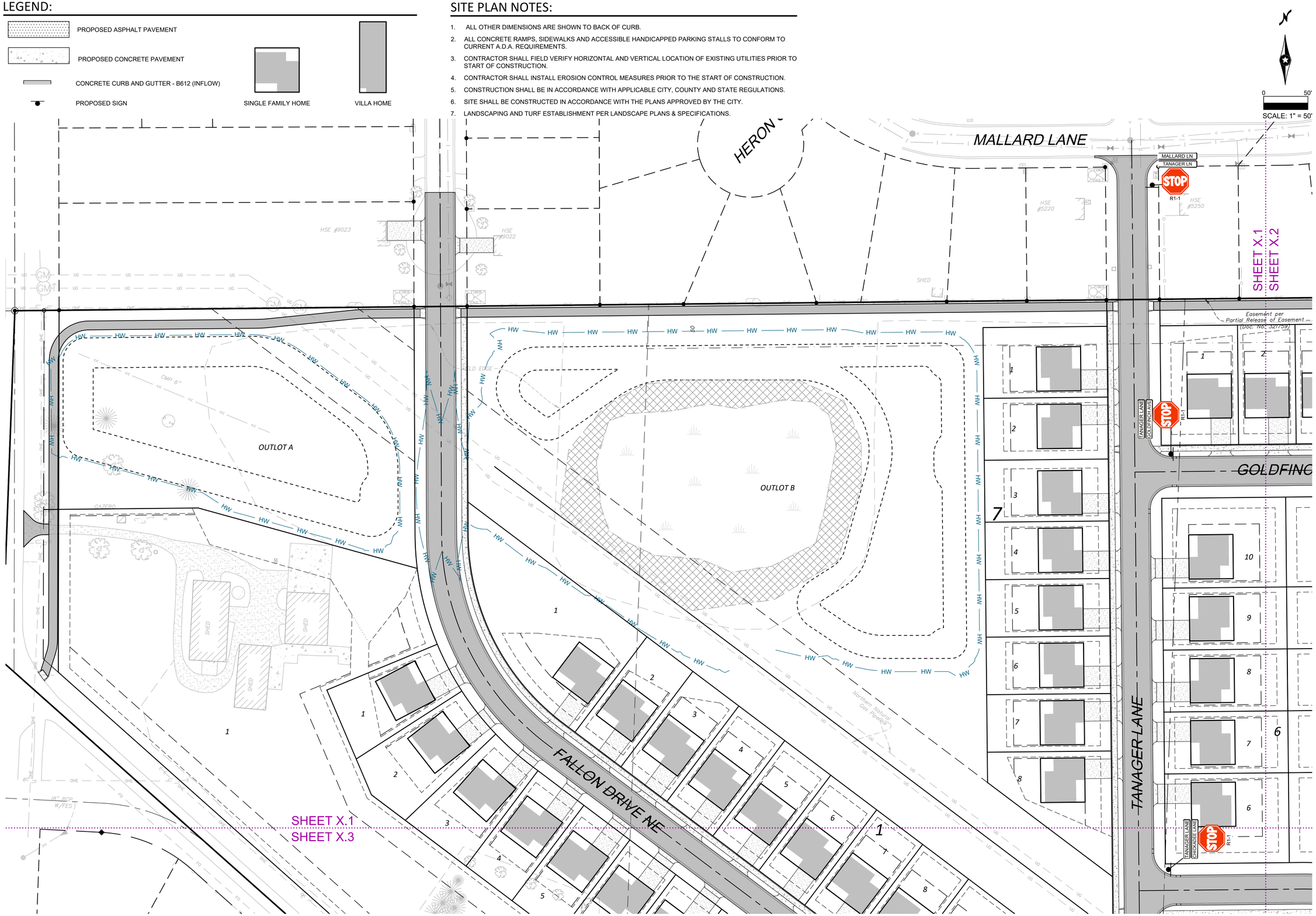
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LEGEND:

- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- CONCRETE CURB AND GUTTER - B612 (INFLOW)
- PROPOSED SIGN
- SINGLE FAMILY HOME
- VILLA HOME

SITE PLAN NOTES:

1. ALL OTHER DIMENSIONS ARE SHOWN TO BACK OF CURB.
2. ALL CONCRETE RAMPS, SIDEWALKS AND ACCESSIBLE HANDICAPPED PARKING STALLS TO CONFORM TO CURRENT A.D.A. REQUIREMENTS.
3. CONTRACTOR SHALL FIELD VERIFY HORIZONTAL AND VERTICAL LOCATION OF EXISTING UTILITIES PRIOR TO START OF CONSTRUCTION.
4. CONTRACTOR SHALL INSTALL EROSION CONTROL MEASURES PRIOR TO THE START OF CONSTRUCTION.
5. CONSTRUCTION SHALL BE IN ACCORDANCE WITH APPLICABLE CITY, COUNTY AND STATE REGULATIONS.
6. SITE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PLANS APPROVED BY THE CITY.
7. LANDSCAPING AND TURF ESTABLISHMENT PER LANDSCAPE PLANS & SPECIFICATIONS.



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MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

NW SIGN PLAN

SHEET NO.

C8.1

12/4/2024 11:00 AM n:\projects current\21-0300.00\tamarack monticello mdeon\Civil\cad files\Sign Plan.dwg

LEGEND:

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- PROPOSED CONCRETE PAVEMENT
- CONCRETE CURB AND GUTTER - B612 (INFLOW)
- PROPOSED SIGN
- SINGLE FAMILY HOME
- VILLA HOME

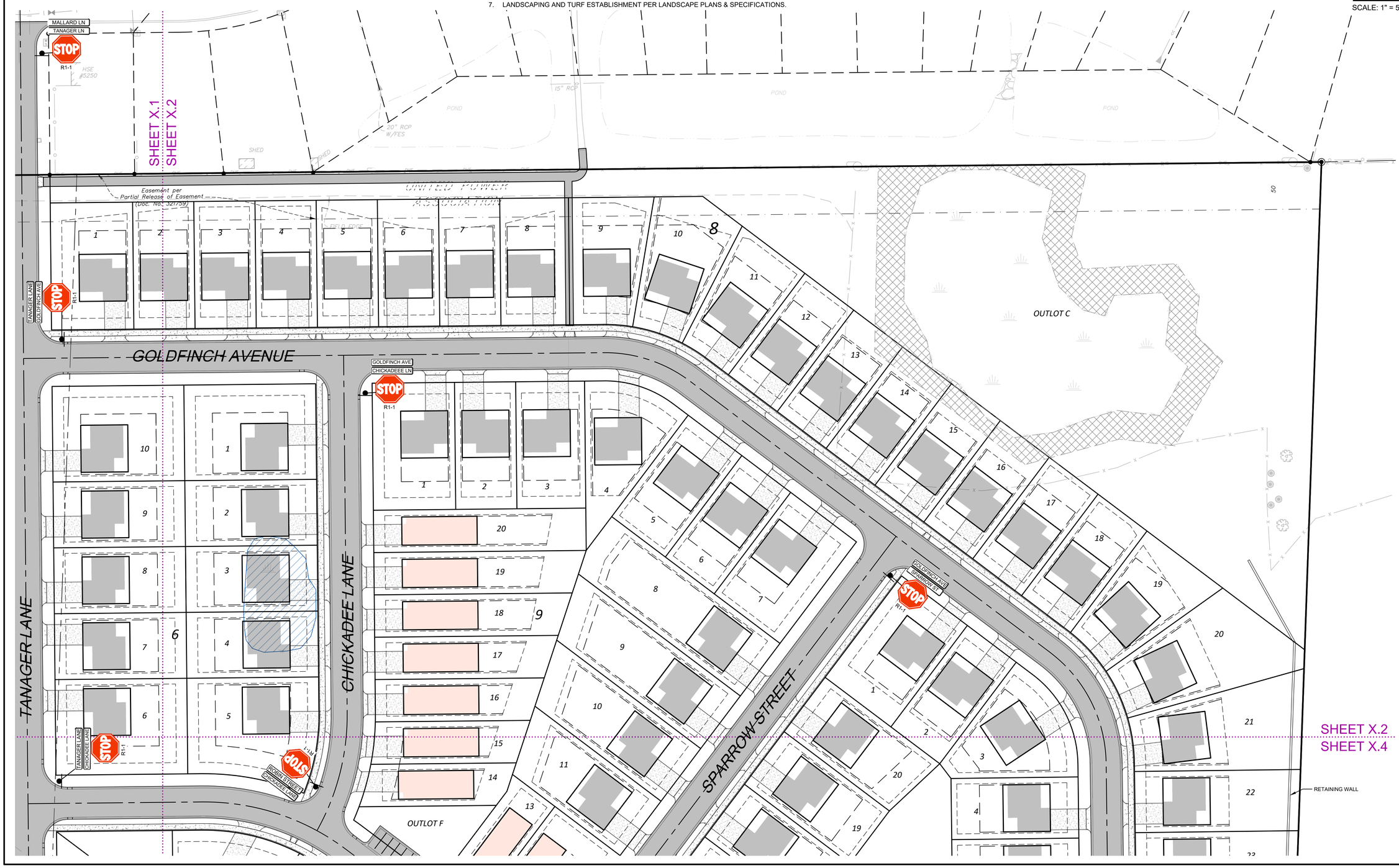
SITE PLAN NOTES:

1. ALL OTHER DIMENSIONS ARE SHOWN TO BACK OF CURB.
2. ALL CONCRETE RAMPS, SIDEWALKS AND ACCESSIBLE HANDICAPPED PARKING STALLS TO CONFORM TO CURRENT A.D.A. REQUIREMENTS.
3. CONTRACTOR SHALL FIELD VERIFY HORIZONTAL AND VERTICAL LOCATION OF EXISTING UTILITIES PRIOR TO START OF CONSTRUCTION.
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6. SITE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PLANS APPROVED BY THE CITY.
7. LANDSCAPING AND TURF ESTABLISHMENT PER LANDSCAPE PLANS & SPECIFICATIONS.

N

0 50'

SCALE: 1" = 50'



REV NO.	DATE	DESCRIPTION
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3	12/11/2024	REVISED PER CITY COMMENTS

DATE: 12/11/2024
DESIGN BY: MJM
DRAWN BY: MJM
CHECKED BY: CJD
DWG FILE: SITE BASE
FILE NO.: 21-0300.00

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.

Signed: _____ Lic. No. _____

Date: _____

BOGART, PEDERSON & ASSOCIATES, INC.
LAND SURVEYING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES
13079 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-9822 FAX: 763-262-9844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

NE SIGN PLAN

SHEET NO.

C8.2

12/24/2024 11:00 AM n:\projects current\21-0300.00 tamarack monticello nelson\Civil\cad files\Sign Plan.dwg

LEGEND:

- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- CONCRETE CURB AND GUTTER - B612 (INFLOW)
- PROPOSED SIGN
- SINGLE FAMILY HOME
- VILLA HOME

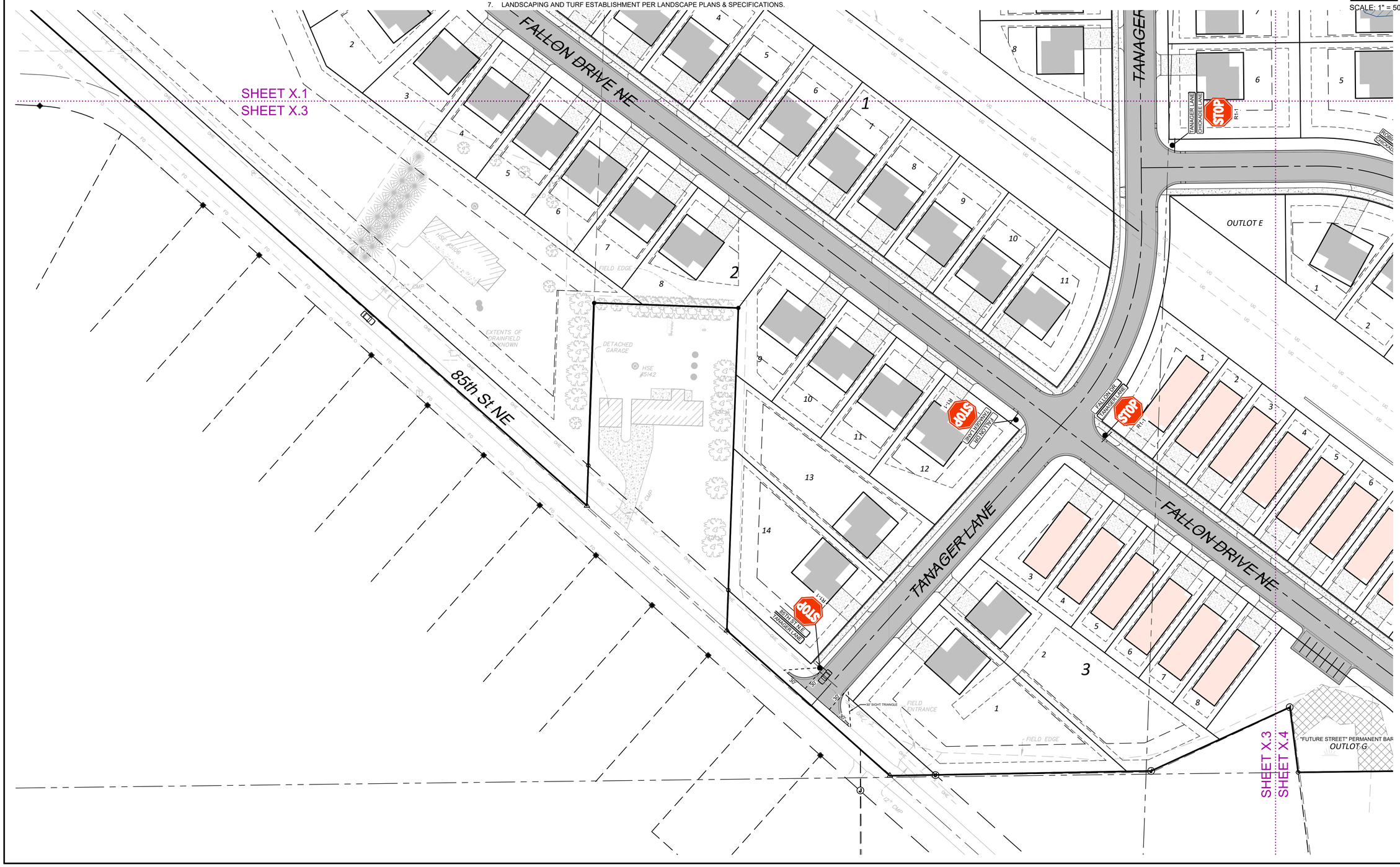
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13078 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-9822 FAX: 763-262-9844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

SW SIGN PLAN

SHEET NO.

C8.3

12/24/2024 11:00 AM n:\projects current\21-0300.00 tamarack monticello nelson\Civil\cad files\Sign Plan.dwg

LEGEND:

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- PROPOSED CONCRETE PAVEMENT
- CONCRETE CURB AND GUTTER - B612 (INFLOW)
- PROPOSED SIGN
- SINGLE FAMILY HOME
- VILLA HOME

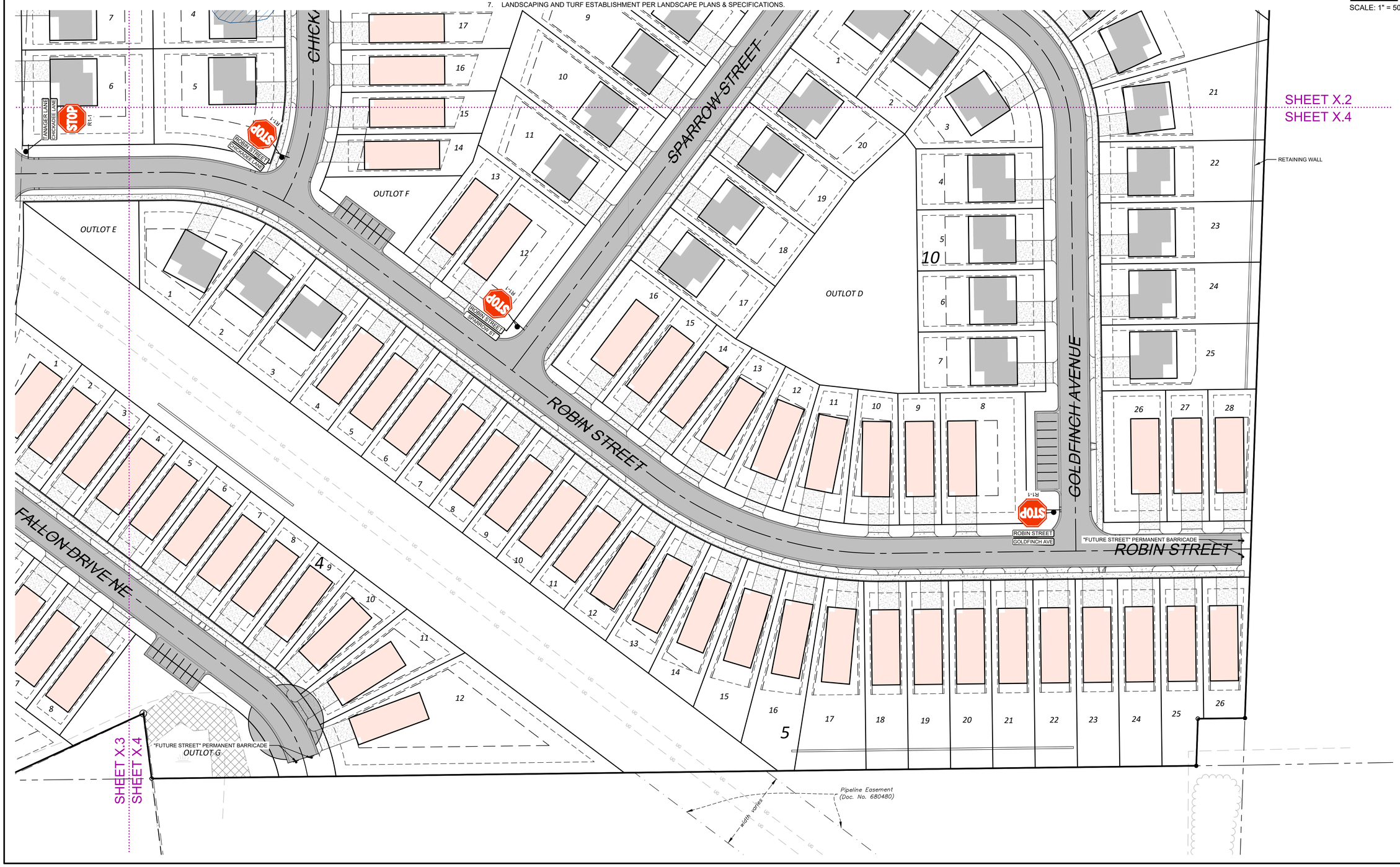
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FILE NO.: 21-0300.00

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TEL 763-262-9622 FAX 763-262-9644

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

SE SIGN PLAN

SHEET NO.

C8.4

12/24/2024 11:00 AM n:\projects current\21-0300.00 tamarack monticello nelson\Civil\cad files\Sign Plan.dwg

LEGEND:

PROPOSED ASPHALT PAVEMENT

PROPOSED CONCRETE PAVEMENT

CONCRETE CURB AND GUTTER - B612 (INFLOW)

PROPOSED SIGN

SINGLE FAMILY HOME

VILLA HOME

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LEGEND:

SIGHT LINE ORIGIN

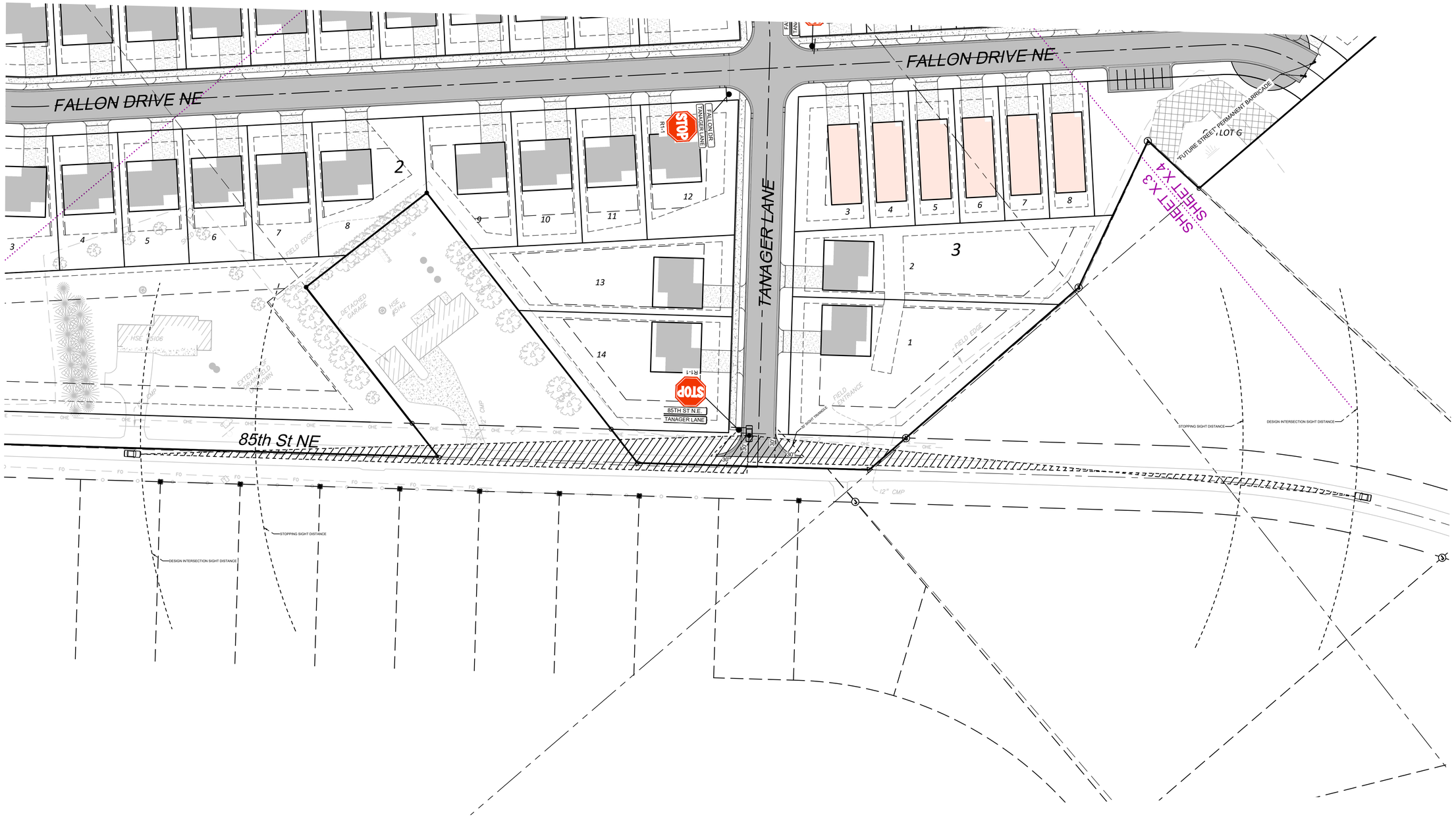
SIGHT TRIANGLE

SIGHT LINE EXHIBIT NOTES:

1. SPEED LIMIT: 55 MPH: DESIGN INTERSECTION SIGHT DISTANCE: 610 FT.
   STOPPING SIGHT DISTANCE: 495 FT.
2. NO SIGHT OBSTRUCTIONS PRESENT WITHIN STOPPING SIGHT DISTANCE TO ENTRANCE OF SITE.

0 50'

SCALE: 1" = 50'



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MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

SIGHT LINE EXHIBIT

SHEET NO.

C8.5

12/24/2024 11:00 AM n:\projects current\21-0300.00 tamarack monticello nelson\Civil\cad files\Sign Plan.dwg

STORM WATER POLLUTION PREVENTION PLAN NARRATIVE:

GENERAL INFORMATION

THIS STORMWATER POLLUTION PREVENTION PLAN IS PREPARED IN ACCORDANCE TO THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT NO. MN R1000001 FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY.
PROJECT NAME: MEADOWS AT PIONEER PARK
LOCATION: 85TH STREET NE, MONTICELLO, MN 55362
WRIGHT COUNTY
LAT/LONG: 45.279027/-93.778512

DESCRIPTION OF CONSTRUCTION ACTIVITY:

DEVELOPMENT CONSISTS OF PAVING, GRADING, UTILITY INSTALLATION, AND TURF ESTABLISHMENT.

PROJECT CONTACTS

DALE WILLENBRING (TAMARACK LAND DEVELOPMENT) AND THE CONTRACTOR ARE RESPONSIBLE FOR IMPLEMENTATION OF THE SWPPP AND THE INSTALLATION, INSPECTION, AND MAINTENANCE OF THE EROSION PREVENTION AND SEDIMENT CONTROL BMP'S BEFORE AND DURING CONSTRUCTION.

SWPPP PREPARATION:
SWPPP PREPARER: CHRISTOPHER DAHN
-BOGART, PEDERSON & ASSOCIATES
TRAINING: ENGINEER AND SWPPP DESIGNER (EXP 2022)
ADDRESS: 13076 FIRST STREET
BECKER, MN 53308-9322
TELEPHONE: 763-262-8822
EMAIL; CDAHN@BOGART-PEDERSON,COM
OWNER:
OWNER CONTACT: DAN WILLENBRING
COMPANY: TAMARACK LAND DEVELOPMENT
TELEPHONE: (952)-715-2926
ADDRESS: 712 VISTA BLVD SUITE 303 WACONIA, MN 55387
EMAIL; DALE@TAMARACKLAND.COM

CONTRACTOR (TO BE FILLED OUT BY THE CONTRACTOR):
BUSINESS NAME _____
OWNER NAME _____
MAILING ADDRESS _____
CITY _____
TELEPHONE _____
EMAIL _____
CONTACT NAME _____
MAILING ADDRESS _____
CITY _____
TELEPHONE _____
EMAIL _____

ESTIMATED DATES OF CONSTRUCTION:

START DATE ___/___/___ (TO BE FILLED IN BY CONTRACTOR)
COMPLETION DATE ___/___/___ (TO BE FILLED IN BY CONTRACTOR)

PERMANENT STORMWATER DESIGN CALCULATIONS:

SEE THE STORM WATER MANAGEMENT REPORT FOR MORE INFORMATION. CONTACT BOGART, PEDERSON & ASSOCIATES FOR REPORT. PROPOSED FLOW RATE IS LIMITED THROUGH LESS IMPERVIOUS SURFACE AND STORM WATER BEING DIRECTED TO AN WET RETENTION BASIN.

SOIL GROUP: A

DESCRIPTION OF EROSION CONTROL ACTIVITY:

EROSION CONTROL CONSISTS OF SILT FENCE PERIMETER CONTROL, TURF ESTABLISHMENT THROUGH SEEDING AND EROSION CONTROL BLANKET, AND ROCK CONSTRUCTION ENTRANCE PLACEMENT.

CUMULATIVE IMPERVIOUS SURFACES:

AREA OF DISTURBANCE:	57.97	ACRES
PRE-CONSTRUCTION IMPERVIOUS AREA:	0.00	ACRES
POST CONSTRUCTION IMPERVIOUS AREA:	18.05	ACRES
NEW IMPERVIOUS AREA:	18.05	ACRES

RECEIVING WATERS:

STORM WATER FROM THIS SITE WILL BE DISCHARGED TO THE REGIONAL WETLAND NORTH WEST OF PROPOSED DEVELOPMENT.

PLANS AND SPECIFICATIONS

THE PLAN SHEETS OF THIS PLAN SET INDICATE THE FOLLOWING ITEMS:
- THE PROJECT LOCATION AND CONSTRUCTION LIMITS.
- LOCATIONS OF IMPERVIOUS SURFACES.
- LOCATIONS OF AREAS NOT TO BE DISTURBED (E.G., BUFFER ZONES, WETLANDS, ETC.).
- STEEP SLOPE LOCATIONS.
- LOCATIONS OF ALL TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL BMP'S TO BE INSTALLED ON THE PROJECT.
- THE DETAIL SHEETS INDICATE EROSION AND SEDIMENT CONTROL BMPS TO BE INSTALLED ON THE PROJECT.
- IF DEWATERING IS REQUIRED FOR THIS PROJECT, THE PUMP DISCHARGE SHALL BE TREATED PRIOR TO BEING DISCHARGED OFF-SITE OR INTO A SURFACE WATER. THE DISCHARGE SHALL BE VISUALLY CHECKED TO ENSURE THAT IT IS VISIBLY CLEAN WATER.

TEMPORARY SEDIMENT CONTROL PRACTICES

DOWN GRADIENT SILT FENCE AND SEDIMENT LOG INSTALLATIONS ARE TO BE INPLACE PRIOR TO THE COMMENCEMENT OF ANY EARTHWORK OPERATIONS.

TOPSOIL IS TO BE WINDROWED ALONG THE CONSTRUCTION LIMITS AND PLACED AS SLOPE DRESSING IMMEDIATELY FOLLOWING COMPLETION OF THE GRADING OPERATIONS, AS THE GRADING OPERATIONS PROCEED.

TOPSOIL PLACEMENT ALONG THE EMBANKMENT SLOPES THOUGH THE WETLANDS AREA IS TO BE SPREAD BY A LOW IMPACT CRAWLER TRACTOR OPERATING UP AND DOWN THE SLOPES SO AS TO PROVIDE TRACK PRINTS PARALLEL WITH THE CONTOURS.

INSTALLATION OF MN/DOT CATEGORY 3 EROSION CONTROL BLANKET ALONG THE EMBANKMENT SLOPES ADJACENT THE WETLANDS AREA.

ALL TEMPORARY SOILS STOCKPILES WILL REQUIRE AN EFFECTIVE MEANS OF SEDIMENT CONTROL SUCH AS AN EROSION CONTROL BLANKET COVERING OR SILT FENCE INSTALLATION ALONG THE TOE OF SLOPE.

ALL COMPLETED SWALES SLOPES AND BOTTOMS NOT DRAINING TOWARDS WETLAND AREAS ARE TO BE STABILIZED WITHIN 7 DAYS.

TEMPORARY STABILIZATION WILL BE REQUIRED IN AREAS WHERE GRADING OPERATIONS ARE SUSPENDED OR CEASED FOR A PERIOD OF 7 DAYS OR GREATER.

A ROCK CONSTRUCTION ENTRANCE FOR SEDIMENT CONTROL IS TO BE PROVIDED AT THE PROJECT ENTRANCE ON 85TH STREET NE.

STREET SWEEPING OF THE PAVED SURFACES WILL BE REQUIRED AS DIRECTED BY THE ENGINEER.

TIMING OF EROSION CONTROL:

SILT FENCE AND SEDIMENT LOGS WILL BE INSTALLED PRIOR TO CONSTRUCTION.

RIPRAP AND FILTER BLANKET WILL BE PLACED AT THE OUTLETS WITHIN 24 HOURS OF THE OUTLET PLACEMENT.

THE CONTRACTOR MUST STABILIZE ALL EXPOSED SOIL AREAS IMMEDIATELY FOLLOWING CONSTRUCTION WHEREVER CONSTRUCTION WILL NOT OCCUR FOR A PERIOD GREATER THAN OR EQUAL TO 7 DAYS.

STABILIZATION WORK MUST BE COMPLETE WITHIN 7 CALENDAR DAYS AFTER THE CONSTRUCTION WORK IN THAT AREA HAS TEMPORARILY OR PERMANENTLY CEASED.

AREAS THAT ARE WITHIN 200 FT OF A PUBLIC WATER MUST BE STABILIZED WITHIN 24 HOURS OF COMPLETING CONSTRUCTION DURING PERIODS OF "WORK IN WATER RESTRICTIONS" FOR TIME PERIODS DECLARED BY THE DNR.

THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN THE DISTURBED AREA UNTIL VEGETATION IN ESTABLISHED.

ONCE VEGETATION IS ESTABLISHED AND CONSTRUCTION IS COMPLETE, THE SILT FENCE AND ANY OTHER TEMPORARY EROSION CONTROL THAT IS NOT BIODEGRADABLE SHALL BE REMOVED.

STREET SWEEPING TO BE PROVIDED AS DIRECTED BY THE ENGINEER OR OWNER. THE CITY REQUIRES STREET SWEEPING TO OCCUR WITHIN 8 HOURS OF NOTICE FROM THE CITY.

APPLYING MULCH, HYDROMULCH, TACKIFIER, POLYACRYLAMIDE OR SIMILAR EROSION PREVENTION PRACTICES IS NOT ACCEPTABLE STABILIZATION IN ANY PART OF A TEMPORARY OR PERMANENT DRAINAGE DITCH OR SWALE. BLANKETS OR OTHER APPROVED, BY THE ENGINEER, METHOD SHALL BE USED.

INSPECTION AND MAINTENANCE ACTIVITIES

THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND SCHEDULING THE WORK OF ALL OPERATIONS, INCLUDING SUBCONTRACTORS AND UTILITY COMPANIES, SUCH THAT EROSION AND SEDIMENT CONTROL MEASURES ARE FULLY EXECUTED FOR EACH OPERATION AND IN A TIMELY MANNER OVER THE DURATION OF THE PROJECT. OPERATORS HAVE DAILY ACCESS TO THE PROJECT SITE. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE SWPPP IMPLEMENTATION UNTIL THE ENTIRE SITE HAS UNDERGONE FINAL STABILIZATION AND N.O.T HAS BEEN SUBMITTED TO THE MPCA.

THE CONTRACTOR IS TO PROVIDE A TRAINED INDIVIDUAL RESPONSIBLE FOR THE IMPLEMENTATION, INSPECTION AND MAINTENANCE OF THE EROSION AND SEDIMENT CONTROL BMPS ON THE PROJECT. THAT INDIVIDUAL IS TO BE IDENTIFIED AT THE PRE-CONSTRUCTION CONFERENCE AND LISTED IN THE MINUTES THEREOF.

THE APPOINTED INDIVIDUAL IS TO PERFORM A ROUTINE INSPECTION OF THE ENTIRE SITE AT LEAST ONCE EVERY SEVEN DAYS DURING CONSTRUCTION OPERATIONS AND WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES IN 24 HOURS.

A INSPECTION FORM WILL BE PROVIDED BY THE CONTRACTOR. ANY DEFICIENCIES IN THE EROSION AND SEDIMENT CONTROL BMPS ARE TO BE NOTED ON THE INSPECTION FORM AND CORRECTED BY THE END OF THE NEXT BUSINESS DAY.

PERIMETER CONTROL DEVICES ARE TO BE REPAIRED OR REPLACED WHEN THEY ARE NO LONGER EFFECTIVE OR WHEN THE SEDIMENT REACHES ONE-HALF THE HEIGHT OF THE DEVICE.

TRAINING DOCUMENTATION:
SWPPP IMPLEMENTATION, REVISING, AMENDING, AND INSPECTING (TO BE FILLED IN BY THE CONTRACTOR)
NAME OF INDIVIDUAL
OVERSEEING & INSPECTING _____
DATE OF TRAINING _____
NAME OF INSTRUCTOR _____
ENTITY PROVIDING TRAINING _____
CONTENT OF TRAINING _____
TOTAL HOURS OF TRAINING _____

BMP INSTALLATION, MAINTENANCE, AND REPAIR (TO BE FILLED IN BY THE CONTRACTOR)
NAME OF INDIVIDUAL
OVERSEEING & INSPECTING _____
DATE OF TRAINING _____
NAME OF INSTRUCTOR _____
ENTITY PROVIDING TRAINING _____
CONTENT OF TRAINING _____
TOTAL HOURS OF TRAINING _____

POLLUTION PREVENTION

FERTILIZERS ARE TO BE APPLIED ONLY IN THE AMOUNTS AS SPECIFIED AND WORKED INTO THE SOIL TO MINIMIZE EXPOSURE TO STORMWATER RUNOFF.

ONSITE REFUELING OPERATIONS ARE TO BE CONDUCTED WITH CARE. ANY INADVERTENT SPILLAGE OF FUEL OR CHEMICALS IS TO BE IMMEDIATELY CLEANED UP, REMOVED FROM THE SITE AND DISPOSED OF IN ACCORDANCE TO STATE AND LOCAL REGULATIONS. MAJOR SPILLS ARE TO BE REPORTED TO THE MPCA 24 HOUR NOTIFICATION NETWORK AT 800 422 0798. ALL VEHICLES ON-SITE ARE TO BE MONITORED FOR LEAKS AND SUBJECT TO ROUTINE PREVENTIVE MAINTENANCE EFFORTS TO REDUCE THE LIKELIHOOD OF LEAKAGE AND OR SPILLS.

PORTABLE SANITARY WASTE FACILITIES ARE TO BE PROVIDED ONSITE AND EMPTIED ON A BI-WEEKLY BASIS.

CONCRETE BATCH TRUCKS WILL NOT BE ALLOWED TO DISCHARGE DRUM AND CHUTE WASHOUT DIRECTLY ON THE GROUND. A PORTABLE WASHOUT RECEPTACLE IS TO BE PROVIDED BY THE CONTRACTOR AT THE LOCATION AS PROVIDED BY THE OWNER.

FINAL STABILIZATION

FINAL STABILIZATION OCCURS WHEN 70 PERCENT OF THE PERVIOUS AREA IS COVERED WITH UNIFORM, PERMANENT VEGETATION.

ALL TEMPORARY EROSION AND SEDIMENT CONTROL FEATURES ARE TO BE REMOVED AND THE NPDES NOTICE OF TERMINATION IS TO BE PREPARED AND SUBMITTED TO THE MPCA.

LOCATION OF SWPPP REQUIREMENTS IN PROJECT PLAN

DESCRIPTION	TITLE	LOCATION
EROSION CONTROL DETAILS	CONSTRUCTION DETAILS	C9.1-9.10
EROSION CONTROL LOCATIONS	EROSION CONTROL LOCATIONS	C7.0

24 HOUR MPCA EMERGENCY NOTIFICATION:
TELEPHONE NUMBERS: 651-649-5451
800-422-0798

ESTIMATED QUANTITIES:

THE FOLLOWING QUANITITES IS AN ESTIMATED PRELIMINARY AMOUNT REQUIRED FOR SEDIMENT CONTROL BMP'S AT THE START OF THE PROJECT. THIS ESTIMATE IS PROVIDED AS REQUIRED BY THE MINNESOTA POLLUTION CONTROL AGENCY GENERAL STORMWATER PERMIT FOR CONSTRUCTION ACTIVITY, ANY ADDITIONAL AND/OR REPLACEMENT BMP'S QUANITITIES WILL BE FURNISHED AND INSTALLED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

ESTIMATED PRELIMINARY QUANITIES AT START OF PROJECT:

ITEM	UNIT	ESTIMATED INITIAL QUANTITY
TEMPORARY CONSTRUCTION ENTRANCE	EA	1
TEMPORARY SEDIMENT FILTER	EA	72
TEMPORARY CONCRETE WASHOUT	EA	1
TEMPORARY SILT FENCE	LF	15,000

TEMPORARY EROSION AND SEDIMENT CONTROL SPECIFICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. PREVENTION OF SEDIMENTATION OF WATERWAYS, OPEN DRAINAGE WAYS, AND STORM AND SANITARY SEWERS DUE TO CONSTRUCTION ACTIVITIES.

1.02 REFERENCE STANDARDS
A. GENERAL PERMIT AUTHORIZATION TO DISCHARGE STORM WATER ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM. MINNESOTA PERMIT NO: MN R100001.

1.03 PERFORMANCE REQUIREMENTS
A. COMPLY WITH ALL REQUIREMENTS OF THE MINNESOTA POLLUTION CONTROL AGENCY FOR EROSION AND SEDIMENT CONTROL.
B. DO NOT BEGIN CLEARING, GRADING, OR OTHER WORK INVOLVING DISTURBANCE OF GROUND SURFACE COVER UNTIL APPLICABLE PERMITS HAVE BEEN OBTAINED; FURNISH ALL DOCUMENTATION REQUIRED TO OBTAIN APPLICABLE PERMITS.
1. OBTAIN AND PAY FOR PERMITS REQUIRED BY AUTHORITY HAVING JURISDICTION.
C. TIMING: PUT PREVENTIVE MEASURES IN PLACE PRIOR TO DISTURBANCE OF SURFACE COVER AND BEFORE PRECIPITATION OCCURS.
D. EROSION OFF SITE: PREVENT EROSION OF SOIL AND DEPOSITION OF SEDIMENT ON OTHER PROPERTIES CAUSED BY WATER LEAVING THE PROJECT SITE DUE TO CONSTRUCTION ACTIVITIES FOR THIS PROJECT.
1. PREVENT TRACKING OF MUD ONTO PUBLIC ROADS OUTSIDE SITE.
2. PREVENT MUD AND SEDIMENT FROM FLOWING ONTO PAVEMENTS.
E. SEDIMENTATION OF WATERWAYS OFF SITE: PREVENT SEDIMENTATION OF WATERWAYS OFF THE PROJECT SITE, INCLUDING RIVERS, STREAMS, LAKES, PONDS, OPEN DRAINAGE WAYS, STORM SEWERS, AND SANITARY SEWERS.
1. IF SEDIMENTATION OCCURS, INSTALL OR CORRECT PREVENTIVE MEASURES IMMEDIATELY AT NO COST TO OWNER; REMOVE DEPOSITED SEDIMENTS; COMPLY WITH REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.
F. MAINTENANCE: MAINTAIN TEMPORARY PREVENTIVE MEASURES UNTIL PERMANENT MEASURES HAVE BEEN ESTABLISHED.

PART 2 PRODUCTS

2.01 MATERIALS
A. TEMPORARY SILT FENCE: WOVEN POLYPROPYLENE GEOTEXTILE RESISTANT TO COMMON SOIL CHEMICALS, MILDEW, AND INSECTS; NON-BIODEGRADABLE; IN LONGEST LENGTHS POSSIBLE; FABRIC INCLUDING SEAMS WITH THE FOLLOWING MINIMUM AVERAGE ROLL LENGTHS:
1. AVERAGE OPENING SIZE: 20 U.S. STD. SIEVE, MAXIMUM, WHEN TESTED IN ACCORDANCE WITH ASTM D4751.
2. PERMITTIVITY: 0.05 SEC^-1, MINIMUM, WHEN TESTED IN ACCORDANCE WITH ASTM D4491.
3. ULTRAVIOLET RESISTANCE: RETAINING AT LEAST 70 PERCENT OF TENSILE STRENGTH, WHEN TESTED IN ACCORDANCE WITH ASTM D4355/D4355M AFTER 500 HOURS EXPOSURE.
4. TENSILE STRENGTH: 100 LB-F, MINIMUM, IN CROSS-MACHINE DIRECTION; 124 LB-F, MINIMUM, IN MACHINE DIRECTION; WHEN TESTED IN ACCORDANCE WITH ASTM D4632.
5. ELONGATION: 15 TO 30 PERCENT, WHEN TESTED IN ACCORDANCE WITH ASTM D4632.
6. TEAR STRENGTH: 55 LB-F, MINIMUM, WHEN TESTED IN ACCORDANCE WITH ASTM D4533.
7. COLOR: MANUFACTURER'S STANDARD, WITH EMBEDMENT AND FASTENER LINES PREPRINTED.
8. SILT FENCE POSTS: ONE OF THE FOLLOWING, MINIMUM 5 FEET LONG:
a. STEEL U- OR T-SECTION, WITH MINIMUM MASS OF 1.33 LB PER LINEAR FOOT.
b. SOFTWOOD, 4 BY 4 INCHES IN CROSS SECTION.
c. HARDWOOD, 2 BY 2 INCHES IN CROSS SECTION.
B. TEMPORARY SEDIMENT LOGS: FILTER LOGS SHALL CONSIST OF TYPE WOOD FIBER BIOROLLS AND THE REQUIREMENTS OF MNDOT SPEC. 3897.
1. SHALL BE ONE OF THE FOLLOWING.
a. SHALL BE SILTSOXX PERIMETER CONTROL BY FILTREXX, INC., OR EQUAL.
C. TEMPORARY SEDIMENT FILTER.
1. SHALL BE ONE OF THE FOLLOWING.
a. DROP-IN SEDIMENT FILTER UNIT THAT INSERTS INTO THE INLET.
1) SHALL BE FLEXSTORM PURE: PERMANENT INLET FILTER BY ADS, INC., OR EQUAL.
(a)PROVIDE CURB OPENING PROTECTION FOR EXISTING INLETS WITH CURB OPENINGS.
D. TEMPORARY ROCK CONSTRUCTION ENTRANCE.
1. ROCK SHALL BE CLEAN 1 TO 2 INCH WASHED ROCK.
E. TEMPORARY SLOPE EROSION PROTECTION.
1. SHALL BE ONE OF THE FOLLOWING.
a. EROSION CONTROL BLANKET.
1) SHALL CONSIST OF A UNIFORM WEB OF INTERLOCKING STRAW OR WOOD FIBERS SANDWICHED BETWEEN AN ATTACHED TOP AND BOTTOM LAYER OF NET BACKING.
2) THE NETTING SHALL BE BIODEGRADABLE CONTAINING SUFFICIENT UV STABILIZATION FOR BREAKDOWN TO OCCUR WITHIN A NORMAL GROWING SEASON.
3) STAPLES USED TO ANCHOR THE BLANKETS SHALL BE U-SHAPED, 11 GAUGE OR HEAVIER STEEL WIRE HAVING A SPAN WIDTH OF 1 INCH AND A LENGTH OF 8 INCHES OR MORE FROM TOP TO BOTTOM AFTER BENDING.
4) THE EROSION CONTROL BLANKETS ACCEPTABLE FOR USE ON THIS PROJECT INCLUDE:
(a)GEO-SYNTHETICS, INC., - LANDLOK 52.
(b)NORTH AMERICAN GREEN - S150.
(c)OR EQUAL.
b. BONDED FIBER MATRIX.
1) THE FIBERS SHALL BE COMPOSED OF 100% WOOD OR WOOD BY-PRODUCTS. A MINIMUM OF 25% OF THE FIBERS SHALL AVERAGE 10.16 MM (0.4 INCHES) IN LENGTH AND 50% OR MORE SHALL BE RETAINED ON A CLARK FIBER CLASSIFIER 24 MESH SCREEN. FIBERS SHALL BE COLORED WITH A WATER SOLUBLE, NON-TOXIC DYE, TO AID IN UNIFORM APPLICATION OVER THE SITE.
2) THE BINDER SHALL BE A HYDRO COLLOID BASED (GUAR GUM) WITH ADDED SLOW-RELEASE AND AGRICULTURAL BASED FERTILIZERS. THE BINDER SHALL NOT DISSOLVE OR DISPERSE UPON REWETTING.
3) THE BFM SLURRY SHALL DRY TO FORM A CRUST APPROXIMATELY 3-6 MM (1/8 TO 1/4 INCHES) THICK ADHERING TO THE SOIL SURFACE.
4) THE MOISTURE CONTENT OF THE MATRIX SHALL BE 12% +/- 3% BY WEIGHT.
5) THE MATRIX SHALL CONSIST OF MATERIALS THAT ARE 100% BIODEGRADABLE AND 100% BENEFICIAL TO PLANT LIFE.
6) THE MATRIX SHALL PROVIDE 100% CONTINUOUS COVERAGE AND SHALL HAVE NO HOLES GREATER THAN 1MM IN SIZE.
7) THE HYDRATED MIXTURE DENSITY SHALL BE APPROXIMATED BY A SLUMP TEST PRIOR TO APPLICATION.
8) THE BFM MULCH: WATER RATIO SHALL BE AS MANUFACTURER RECOMMENDATIONS. THE MINIMUM BFM MULCH TO WATER RATIO IS 50LBS BFM MULCH AND 100 GALLONS WATER. THE WATER RATE WILL VARY BETWEEN 100 GALLONS AND 125 GALLONS PER 50LBS, DEPENDING ON WHICH OF THE PRODUCTS IS USED.
9) THE BONDED FIBER MATRIX MULCH PRODUCTS ACCEPTABLE FOR USE ON THIS PROJECT INCLUDE.
(a)ECOAEGIS - MANUFACTURED BY CANFOR.
(b)SOIL GUARD - MANUFACTURED BY MAT, INC.
(c)CONWED 3000 - MANUFACTURED BY CONWED FIBERS, INC.
F. TEMPORARY PUMPED SEDIMENT CONTROL DEVICE.
1. NON-WOVEN GEOTEXTILE FABRIC SEWN INTO A BAG USING A DOUBLE NEEDLE MACHINE AND HIGH STRENGTH THREAD.
a. SEAMS SHALL HAVE AN AVERAGE WIDTH STRENGTH OF 60LB/INCH AS PER ASTM D4883 AND MEET OR EXCEED THE FOLLOWING.
1) GRAB TENSILE OF 205 LBS AS PER ASTM D 4632.
2) PUNCTURE OF 110 LBS AS PER ASTM D 4833.
3) FLOW RATE OF 95 GAL/MIN/SF AS PER ASTM D 4491.
4) PERMITTIVITY OF 1.5 SEC-1 AS PER ASTM D 4491.
5) MULLEN BURST STRENGTH OF 350 PSI AS PER ASTM D 3786.
6) AOS% OF 80% US SIEVE AS PER ASTM D 4751.
2. SPOUT LARGE ENOUGH TO ACCOMMODATE A 4 INCH DISCHARGE HOSE WITH STRAP TO TIE UNIT CLOSED.
3. SHALL BE ONE OF THE FOLLOWING.
a. DIRTBAG.
1) ACF ENVIRONMENTAL, INC., 2831 CARDWELL ROAD, RICHMOND, VIRGINIA 23234, 800-448-3636.
b. DANDY DEWATERING BAG.
1) DANDY PRODUCTS, INC., P.O. BOX 1980, WESTERVILLE, OHIO 43086, 800-591-2284.
c. OR EQUAL.

PART 3 EXECUTION

3.01 PREPARATION
A. SCHEDULE WORK SO THAT SOIL SURFACES ARE LEFT EXPOSED FOR THE MINIMUM AMOUNT OF TIME.
B. THE CONSTRUCTION SITE OPERATOR SHALL FOLLOW ALL REQUIREMENTS OF THE MINNESOTA STORMWATER PERMIT NO. MN R100001.
C. THE CONTRACTOR SHALL COMPLETE AND SIGN THE NOTICE OF INTENT, OBTAIN THE OWNER'S SIGNATURE, AND SUBMIT TO THE MPCA.
1. PROVIDE A SIGNED COPY TO THE OWNER.

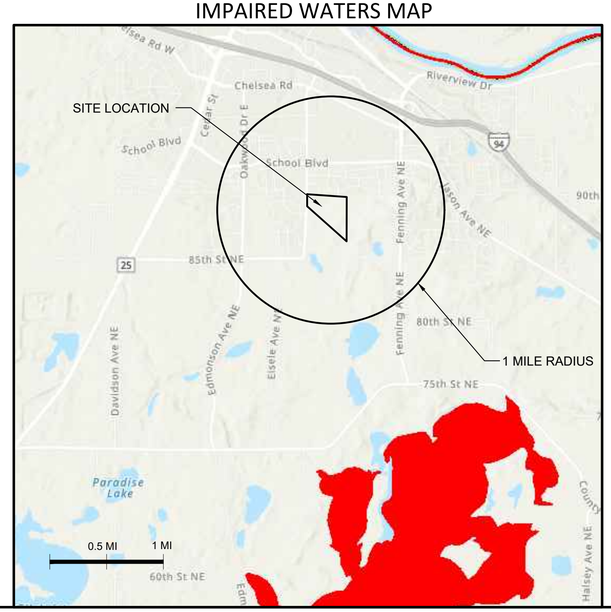
3.03 INSTALLATION
A. TEMPORARY ROCK CONSTRUCTION ENTRANCE.
1. THE ROCK AREA SHALL BE A MINIMUM OF 6 INCHES DEEP, EXTEND THE FULL WIDTH OF THE EGRESS AREA AND SHALL BE AT LEAST 50FT LONG, HOWEVER, LONGER ENTRANCES MAY BE REQUIRED TO ADEQUATELY CLEAN THE TIRES.
2. GEOTEXTILE FABRIC MAY BE USED TO PREVENT MIGRATION OF MUD FROM THE UNDERLYING SOIL INTO THE ROCK.
B. TEMPORARY SILT FENCES:
1. STORE AND HANDLE FABRIC IN ACCORDANCE WITH ASTM D4873.
2. USE NOMINAL 30 INCH HIGH BARRIERS, MINIMUM 60 INCH LONG POSTS SPACED AT 6 FEET MAXIMUM SPACING.
3. EMBED BOTTOM OF FABRIC IN A TRENCH ON THE UPSLOPE SIDE OF FENCE, WITH 6 INCHES OF FABRIC LAID FLAT ON BOTTOM OF TRENCH FACING UPSLOPE; BACKFILL TRENCH AND COMPACT.
4. MINIMUM POST EMBEDMENT.
a. STEEL POST = 24 INCHES, MINIMUM.
b. WOOD POST = 18 INCHES, MINIMUM.
5. DO NOT SPLICE FABRIC WIDTH; MINIMIZE SPLICES IN FABRIC LENGTH; SPLICE AT POST ONLY, OVERLAPPING AT LEAST 18 INCHES, WITH EXTRA POST.
6. FASTEN FABRIC TO WOOD POSTS USING ONE OF THE FOLLOWING:
a. FOUR NAILS PER POST WITH 3/4 INCH DIAMETER FLAT OR BUTTON HEAD, 1 INCH LONG, AND 14 GAGE, 0.083 INCH SHANK DIAMETER.
b. FIVE STAPLES PER POST WITH AT LEAST 17 GAGE, 0.0453 INCH WIRE, 3/4 INCH CROWN WIDTH AND 1/2 INCH LONG LEGS.
7. FASTEN FABRIC TO STEEL POSTS USING WIRE, NYLON CORD, OR INTEGRAL POCKETS.
C. TEMPORARY SEDIMENT LOGS:
1. PERIMETER CONTROL SHOULD BE INSTALLED PARALLEL TO THE BASE OF THE SLOPE OR OTHER DISTURBED AREA.
2. STAKES SHOULD BE INSTALLED THROUGH THE MIDDLE OF THE PERIMETER CONTROL ON 10 FT CENTERS, USING 2 IN BY 2 IN BY
3 FT WOODEN STAKES. IN THE EVENT STAKING IS NOT POSSIBLE, I.E., WHEN PERIMETER CONTROL IS USED ON PAVEMENT, HEAVY CONCRETE BLOCKS SHALL BE USED BEHIND THE PERIMETER CONTROL TO HELP STABILIZE DURING RAIN EVENTS.
D. TEMPORARY SEDIMENT FILTERS.
1. DROP-IN SEDIMENT TRAP.
a. PLACE AS RECOMMENDED BY THE MANUFACTURER.
E. TEMPORARY PUMPED SEDIMENT CONTROL DEVICE.
1. INSTALL AS PER MANUFACTURER'S RECOMMENDATIONS.
F. TEMPORARY SLOPE EROSION PROTECTION.
1. PLACE AT ANY AND ALL FINISH SLOPES THAT ARE STEEPER THAN 10H:1V.
2. SEED AND FERTILIZE PER SPECIFICATION 32 9219 PRIOR TO INSTALLING TEMPORARY SLOPE EROSION PROTECTION.
3. BONDED FIBER MATRIX.
a. INSTALL THE BFM AS PER THE MANUFACTURER'S INSTRUCTIONS WITH THE FOLLOWING MINIMUM GUIDELINES.
1) THE BFM SHALL BE APPLIED WITH HYDRAULIC SPRAY EQUIPMENT BY A MANUFACTURER'S CERTIFIED APPLICATOR.
2) APPLICATION SHALL BE DONE AT LEAST 24 HOURS IN ADVANCE OF PROJECTED RAINFALL TO ALLOW THE BFM MULCH ADEQUATE TIME TO DRY.
3) THE BFM MULCH SHALL BE APPLIED IN TWO STAGES (ONE-HALF RATE) WITH AMPLE TIME TO DEWATER THE FIRST APPLICATION.
4) THE BFM MULCH SHALL BE APPLIED FROM AT LEAST TWO ALTERNATE DIRECTIONS, PREFERABLY 90 DEGREES APART, IF POSSIBLE, TO ENSURE ALL SOIL FACES ARE COVERED.
5) THE INSTALLATION RATE OF THE BFM MULCH SHALL BE 3500 LBS PER ACRE, MINIMUM AND 100% COVERAGE.
4. EROSION CONTROL BLANKET.
a. INSTALL AS PER MANUFACTURER'S RECOMMENDATIONS.

3.04 MAINTENANCE
A. INSPECT PREVENTIVE MEASURES WEEKLY, WITHIN 24 HOURS AFTER THE END OF ANY STORM THAT PRODUCES 0.5 INCHES OR MORE RAINFALL AT THE PROJECT SITE, AND DAILY DURING PROLONGED RAINFALL.
B. REPAIR DEFICIENCIES IMMEDIATELY.
C. TEMPORARY SILT FENCES:
1. PROMPTLY REPLACE FABRIC THAT DETERIORATES UNLESS NEED FOR FENCE HAS PASSED.
2. REMOVE SILT DEPOSITS THAT EXCEED ONE-THIRD OF THE HEIGHT OF THE FENCE.
3. REPAIR FENCES THAT ARE UNDERCUT BY RUNOFF OR OTHERWISE DAMAGED, WHETHER BY RUNOFF OR OTHER CAUSES.
D. TEMPORARY CONSTRUCTION EXIT.
1. PERIODIC ADDITION OF ROCK, OR REMOVAL AND REPLACEMENT OF PAD SHALL BE PROVIDED AS VOIDS BECOME FILLED WITH SOIL.
E. TEMPORARY PUMPED SEDIMENT CONTROL DEVICE.
1. REPLACE THE UNIT WHEN 1/2 FULL OF SEDIMENT OR WHEN SEDIMENT HAS REDUCED THE FLOW RATE OF THE PUMP DISCHARGE TO AN IMPRACTICAL RATE.
F. PLACE SEDIMENT IN APPROPRIATE LOCATIONS ON SITE; DO NOT REMOVE FROM SITE.

3.05 CLEAN UP
A. REMOVE TEMPORARY MEASURE AFTER PERMANENT VEGETATION HAS BEEN ESTABLISHED.
B. WHERE REMOVAL OF TEMPORARY MEASURES WOULD LEAVE EXPOSED SOIL, SHAPE SURFACE TO AN ACCEPTABLE GRADE AND FINISH TO MATCH ADJACENT GROUND SURFACES.

END OF SECTION

IMPAIRED WATERS MAP



REV NO.	DATE	DESCRIPTION
-	09/07/2022	DRAWINGS ISSUED TO CITY
1	09/19/2022	REVISED PER PUD REVIEW
2	07/26/2024	UPDATED WITH NEW LAYOUT
3	12/11/2024	REVISED PER CITY COMMENTS

DATE: 12/11/2024
DESIGN BY: MJM
DRAWN BY: MJM
CHECKED BY: CJD
DWG FILE: SWPPP
FILE NO.: 21-0300.00

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.

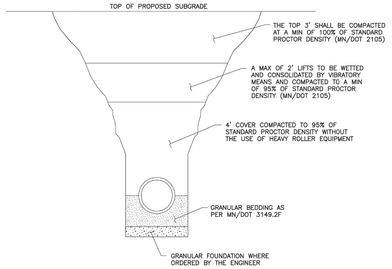
Signed:_____ Lic. No.
Date:_____

BOGART, PEDERSON & ASSOCIATES, INC.
LAND SURVEYING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES
13076 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-8822 FAX: 763-262-8844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN
SWPPP NARRATIVE

SHEET NO.
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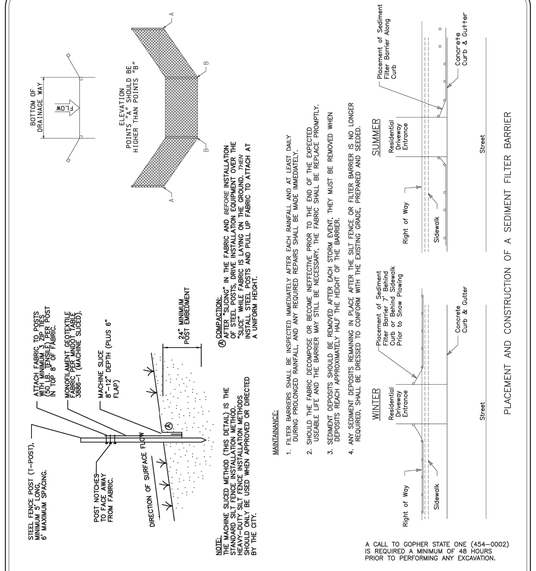


SHOVEL, PLACE, AND HAND COMPACT AROUND PIPE TO 12" ABOVE PIPE. VIBRATORY COMPACTION REQUIRED EACH SIDE OF PIPE, AS DIRECTED BY THE ENGINEER.

Standard Plate Library
City of Monticello

Title: **Typical Trench Compaction and Class B Bedding**

Date: 03–05 | Revised: 03–15 | Plate No. 1007



NOTE:
THE MACHINE SLICED METHOD (THIS DETAIL) IS THE STANDARD SILT FENCE INSTALLATION METHOD. THE STANDARD WIRE BACKED SILT FENCE SHOULD ONLY BE USED WHEN APPROVED OR DIRECTED BY THE CITY.

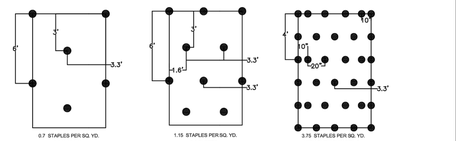
MAINTENANCE:
1. FILTER BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
2. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER MAY STILL BE NECESSARY, THE FABRIC SHALL BE REPLACE PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.
4. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE OR FILTER BARRIER IS NO LONGER REQUIRED, SHALL BE DRESSED TO CONFORM WITH THE EXISTING GRADE, PREPARED AND SEEDED.

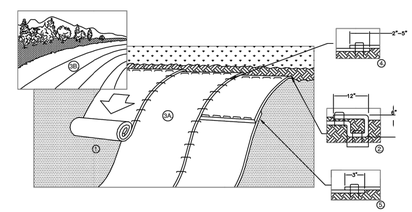
A CALL TO GOPHER STATE ONE (454–0002) IS REQUIRED A MINIMUM OF 48 HOURS PRIOR TO PERFORMING ANY EXCAVATION.

Standard Plate Library
City of Monticello

Title: **Residential Building Erosion Control**

Date: 03–05 | Revised: 03–15 | Plate No. 6006





1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.

2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" (15cm) DEEP X 6" (15cm) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30cm) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30cm) PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30cm) APART ACROSS THE WIDTH OF THE BLANKET.

3. ROLL THE BLANKETS (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING OPTIONAL DOT SYSTEM , STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.

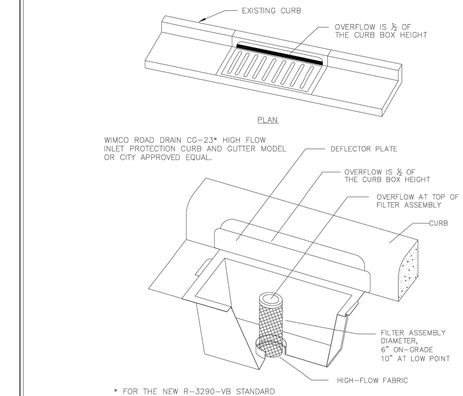
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2"-5" (5cm-12.5cm) OVERLAP DEPENDING ON BLANKET TYPE. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH ON THE PREVIOUSLY INSTALLED BLANKET.
5. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5cm) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30cm) APART ACROSS ENTIRE BLANKET WIDTH.

NOTE:
*IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15cm) MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

Standard Plate Library
City of Monticello

Title: **Erosion Control Blanket Stapling Patterns & Installation**

Date: 03–08 | Revised: 03–15 | Plate No. 6011

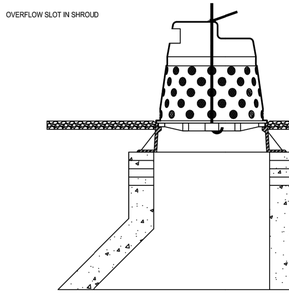


* FOR THE NEW R–3290–VB STANDARD CASTING, INSTALL WIMCO ROAD DRAIN CG–3290 OR CITY APPROVED EQUAL.

Standard Plate Library
City of Monticello

Title: **Inlet Protection Catch Basin Insert**

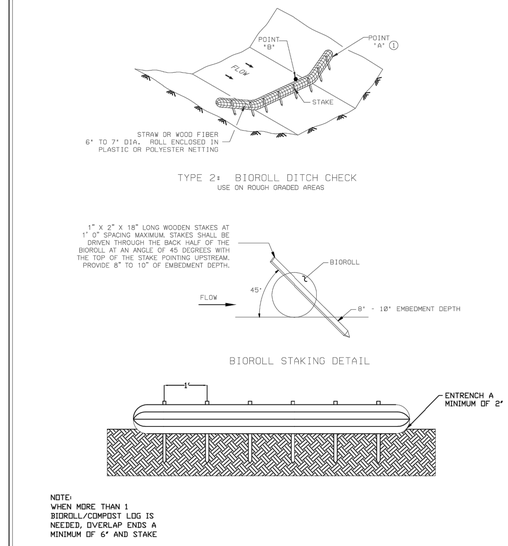
Date: 03–07 | Revised: 03–15 | Plate No. 6004



Standard Plate Library
City of Monticello

Title: **Inlet Protection Grate Inlet Cover**

Date: 03–07 | Revised: 03–15 | Plate No. 6005

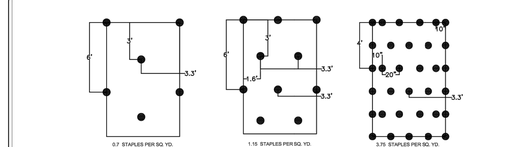


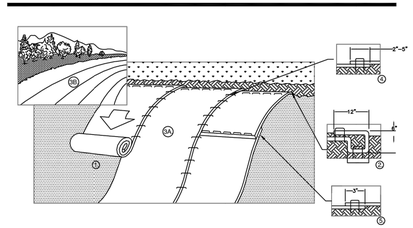
NOTE:
WHEN MORE THAN 1 BIOROLL/COMPOST LOG IS NEEDED, OVERLAP ENDS A MINIMUM OF 6" AND STAKE

Standard Plate Library
City of Monticello

Title: **Bio Log Staking Straw or Wood Bio Roll**

Date: 03–08 | Revised: 03–15 | Plate No. 6009





1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.

2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" (15cm) DEEP X 6" (15cm) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30cm) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30cm) PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30cm) APART ACROSS THE WIDTH OF THE BLANKET.

3. ROLL THE BLANKETS (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING OPTIONAL DOT SYSTEM , STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.

4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2"-5" (5cm-12.5cm) OVERLAP DEPENDING ON BLANKET TYPE. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH ON THE PREVIOUSLY INSTALLED BLANKET.
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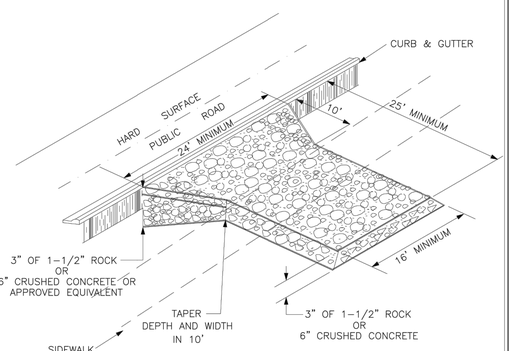
NOTE:
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Standard Plate Library
City of Monticello

Title: **Erosion Control Blanket Stapling Patterns & Installation**

Date: 03–08 | Revised: 03–15 | Plate No. 6011

SPECIAL NOTE:
SPECIAL ATTENTION SHALL BE PAID WHEN INSTALLING DRIVEWAYS TO NOT UNDERMINE OR DAMAGE EXISTING SIDEWALKS.



Standard Plate Library
City of Monticello

Title: **Residential Gravel Construction Entrance**

Date: 03–05 | Revised: 03–15 | Plate No. 6001

REV NO.	DATE	DESCRIPTION
-	09/07/2022	DRAWINGS ISSUED TO CITY
1	09/19/2022	REVISED PER PUD REVIEW
2	07/26/2024	UPDATED WITH NEW LAYOUT
3	12/11/2024	REVISED PER CITY COMMENTS

DATE: 12/11/2024
DESIGN BY: MJM
DRAWN BY: MJM
CHECKED BY: CJD
DWG FILE: DETAILS
FILE NO.: 21-0300.00

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.

Signed: _____ Lic. No. _____
Date: _____

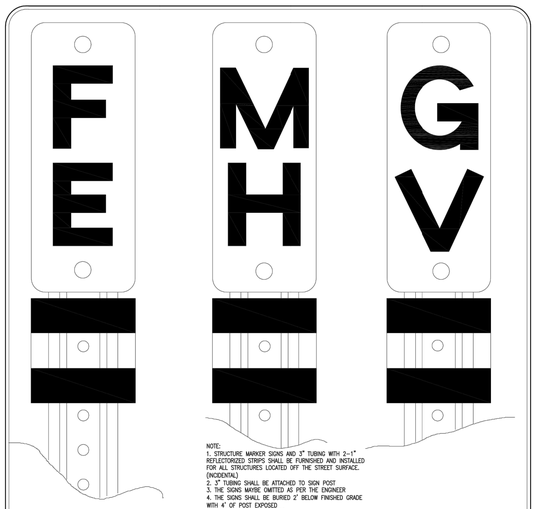
BOGART, PEDERSON & ASSOCIATES, INC.
LAND SURVEYING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES
13076 FIRST STREET | BECKER, MN 55308-9322
TEL: 763-261-4822 | FAX: 763-262-8844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

DETAILS

SHEET NO.
C9.1

12/4/2024 11:01 AM n:\projects current\21-0300.00 tamarack monticello nelson\Civil\cad files\Covers\SWPPP\Details.dwg

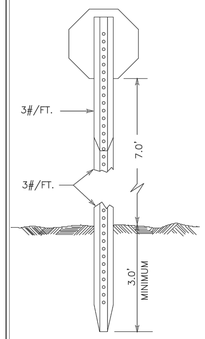


NOTE:
1. STRUCTURE MARKER SIGNS AND 3" TUBING WITH 2-1" REFLECTORIZED STRIPS SHALL BE FURNISHED AND INSTALLED FOR ALL STRUCTURES LOCATED OFF THE STREET SURFACE. (INCIDENTAL)
2. 3" TUBING SHALL BE ATTACHED TO SIGN POST
3. THE SIGNS MAYBE OMITTED AS PER THE ENGINEER
4. THE SIGNS SHALL BE BURIED 2' BELOW FINISHED GRADE WITH 4' OF POST EXPOSED
5. SIGNS SHALL FACE TRAFFIC

0.063" THICK ALUMINUM SIGN, BLACK LETTERS ON WHITE HIGH INTENSITY REFLECTORIZED BACKGROUND.
U-CHANNEL POST, MINIMUM 1.2 LB./FT.
6' LONG, GALVANIZED.

Standard Plate Library
City of Monticello

Title: **Structure Marker Sign**
Date: 03-05
Revised: 03-15
Plate No. 1005



TRAFFIC SIGN SPECIFICATIONS

MATERIAL:

ALUMINUM SHALL BE 5052-H38 OR 6061-T6 ALLOY.
GAUGE SHALL BE: .080 ON THE LONGEST SIDE UP TO 30"
.100 ON THE LONGEST SIDE OVER 30"

REFLECTING SHEETING SHALL BE DIAMOND GRADE. ALL SIGNS CONFORM TO SECTIONS 2564 AND 3352, SIGNS AND MARKERS STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.

CHANNEL POST SPECIFICATIONS

GALVANIZED STEEL CHANNEL POSTS SHALL BE USED, 2.5 LB/FT POSTS SHOULD BE USED THAT ARE PUNCHED ON 1" CC. GALVANIZED POSTS SHALL BE OF THE 4-RIB DESIGN. POSTS ARE TO BE 7 FEET IN HEIGHT BETWEEN BOTTOM OF SIGN AND FINISHED GROUND.

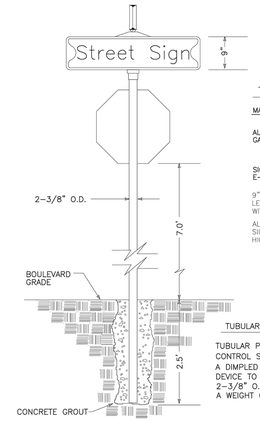
BOLTS, NUTS, AND WASHERS

HARDWARE SHALL BE GRADE 5 MINIMUM AND BE GALVANIZED OR CADMIUM PLATED.

NOTE:
TYPICAL SIGN INSTALLATION WHEN STREET NAME SIGNS ARE NOT INSTALLED

Standard Plate Library
City of Monticello

Title: **Typical Traffic Sign Installation**
Date: 03-05
Revised: 03-17
Plate No. 5016



NOTE: CONCRETE GROUT TO BE MIXED THOROUGHLY WITH WATER BEFORE INSTALLATION

TRAFFIC SIGN SPECIFICATIONS

MATERIAL:

ALUMINUM SHALL BE: 5052-H38 OR 6061-T6 ALLOY
GAUGE SHALL BE: .080 ON THE LONGEST SIDE UP TO 30"
.100 ON THE LONGEST SIDE OVER 30"
SIGNS SHALL BE NOTCHED FOR USE WITH E-450 BRACKETS

9" STREET NAME SIGNS SHALL HAVE 6" UPPER CASE LETTERS WHITE ON GREEN HIGH INTENSITY GRADE SHEETING WITH WHITE SERIES E BORDER

ALL SIGNS SHALL CONFORM TO SECTIONS 2564 AND 3352, SIGNS AND MARKERS STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.

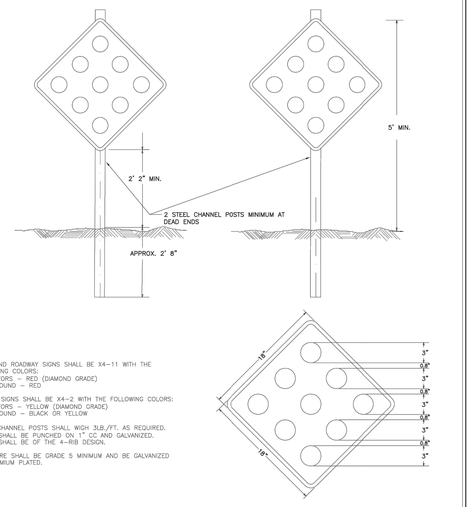
TUBULAR POSTS SPECIFICATIONS

TUBULAR POSTS USED FOR MOUNTING STREET NAME/TRAFFIC CONTROL SIGNS, SHALL VARY IN LENGTH, SHALL HAVE A DIMPLED TUBE BELOW GRADE OR INSTALL A ANTI-ROTATION DEVICE TO PREVENT TUBE FROM TURNING, SHALL BE 2-3/8" O.D., SHALL BE GALVINIZED AND SHALL HAVE A WEIGHT OF 2LB./FT.

NOTE:
TYPICAL SIGN INSTALLATION WHEN STREET NAME SIGNS ARE TO BE INSTALLED

Standard Plate Library
City of Monticello

Title: **Typical Traffic Sign Installation**
Date: 03-05
Revised: 03-15
Plate No. 5017



NOTES:
DEAD END ROADWAY SIGNS SHALL BE X4-11 WITH THE FOLLOWING COLORS:
REFLECTORS - RED (DIAMOND GRADE)
BACKGROUND - RED

MEDIAN SIGNS SHALL BE X4-2 WITH THE FOLLOWING COLORS:
REFLECTORS - YELLOW (DIAMOND GRADE)
BACKGROUND - BLACK OR YELLOW

STEEL CHANNEL POSTS SHALL WIGH 3LB./FT. AS REQUIRED. POSTS SHALL BE PUNCHED ON 1" CC AND GALVANIZED. POSTS SHALL BE OF THE 4-RIB DESIGN.

HARDWARE SHALL BE GRADE 5 MINIMUM AND BE GALVANIZED OR CADMIUM PLATED.

Standard Plate Library
City of Monticello

Title: **Permanent Barricade & Hazard Markers**
Date: 03-05
Revised: 03-15
Plate No. 5018

REV NO.	DATE	DESCRIPTION
-	09/07/2022	DRAWINGS ISSUED TO CITY
1	09/19/2022	REVISED PER PUD REVIEW
2	07/26/2024	UPDATED WITH NEW LAYOUT
3	12/11/2024	REVISED PER CITY COMMENTS

DATE: 12/11/2024
DESIGN BY: MJM
DRAWN BY: MJM
CHECKED BY: CJD
DWG FILE: DETAILS
FILE NO.: 21-0300.00

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.

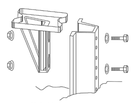
Signed: _____ Lic. No. _____
Date: _____

BOGART, PEDERSON & ASSOCIATES, INC.
LAND SURVEYING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES
13076 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-9822 FAX: 763-262-9844

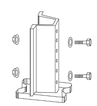
MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

DETAILS

SHEET NO.
C9.2



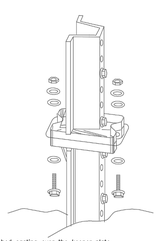
1. Drive a 1.1 m (3.5 ft) base post in the ground so that no more than 100 mm (4") is above ground level. Neat casting into top of post. Insert two 8 mm x 40 mm SLIP SAFE socket-head attachment bolts with flat washers through the post. Place the nuts on the inside of the casting. Tighten the bolts using the turn-of-the-bolt method. The bolts should be tightened 1/2 to 3/4 turn after snug.



2. Attach casting to top post using two 8 mm x 40 mm SLIP SAFE socket-head attachment bolts with flat washer through casting and post. (Note: If top post will be used with a street sign bracket, attach the SLIP SAFE casting into the opposite end of the top post where the first hole is 25 mm (1") from end. This will ensure that the street sign casting will align correctly with the holes in the top post.) Attach the second casting to top post in same manner.



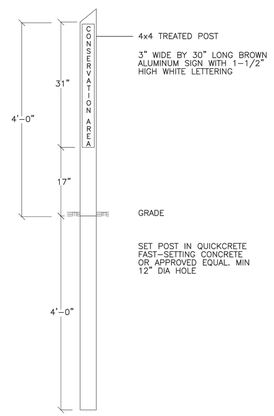
3. Place keeper plate on top of the base post SLIP SAFE casting with keeper plate holes aligned to v-notches in casting.



4. Position SLIP SAFE top post with attached casting over the keeper plate and base posts SLIP SAFE casting so that both SLIP SAFE castings align. Place a flat washer on the two 13 mm x 55 mm SLIP SAFE attachment bolts and insert them from the bottom, up through the holes in the keeper plate. Place a second flat washer over the protruding bolts. Put on lock washers and nuts and tighten. Using the turn-of-the-bolt method, the attachment nuts should be tightened 1/3 to 1/2 turn after snug.

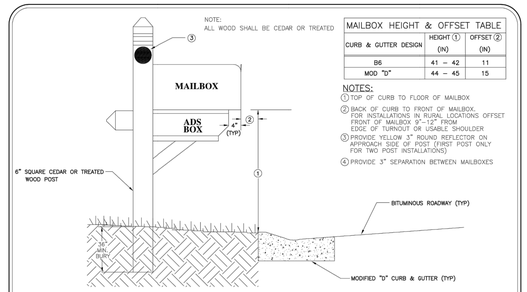
Standard Plate Library
City of Monticello

Title: **Slip Safe Breakaway System**
Date: 03-05
Revised: 03-15
Plate No. 5019



Standard Plate Library
City of Monticello

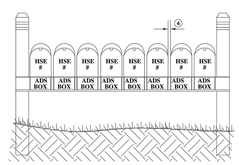
Title: **Conservation Easement Post Detail**
Date: 03-05
Revised: 03-15
Plate No. 5020



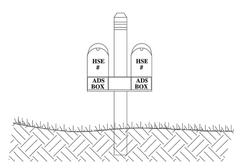
MAILBOX HEIGHT & OFFSET TABLE		
CURB & GUTTER DESIGN	HEIGHT ① (IN)	OFFSET ② (IN)
B6	41 - 42	11
MOD "D"	44 - 45	15

NOTES:
① TOP OF CURB TO FLOOR OF MAILBOX
② BACK OF CURB TO FRONT OF MAILBOX. FOR INSTALLATIONS IN RURAL LOCATIONS OFFSET FRONT OF MAILBOX 9"-12" FROM EDGE OF TURNOUT OR USABLE SHOULDER
③ PROVIDE YELLOW 3" ROUND REFLECTOR ON APPROACH SIDE OF POST (FIRST POST ONLY FOR TWO POST INSTALLATIONS)
④ PROVIDE 3" SEPARATION BETWEEN MAILBOXES

NOTE: MINIMUM 3 MAILBOXES TO MAXIMUM 8 MAILBOXES ON DOUBLE POST INSTALLATION



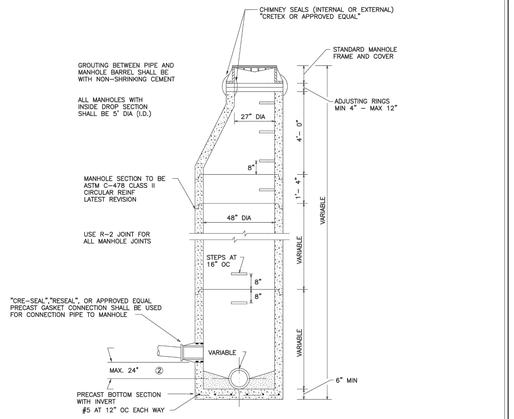
NOTE: 1 MAILBOX TO MAXIMUM 2 MAILBOXES ON SINGLE POST INSTALLATION



Standard Plate Library
City of Monticello

Title: **Mailbox Detail New-Residential**
Date: 03-07
Revised: 03-15
Plate No. 5014

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STANDARD MANHOLE FOR SANITARY SEWER

NO SCALE

NOTES:

① MANHOLE STEPS SHALL BE CAST IRON OR MA MODEL PS-I-PF (BY MA INDUSTRIAL INC.) CONFORMING TO ALL OSHA REGULATIONS AND SPACED 16" OC.

② IF DROP IS GREATER THAN 24" INCHES, USE OUTSIDE DROP.

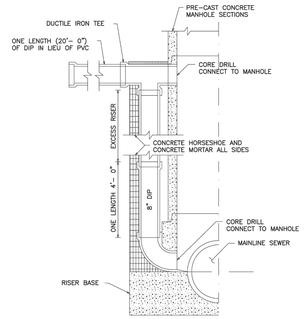
Standard Plate Library City of Monticello

Title: **Standard Sanitary Manhole**

Date: 03-05 | Revised: 03-15 | Plate No. 3001

FOR COMPLETE TYPE "A" DROP SECTION

UNIT PRICE SHALL INCLUDE ANY CUTTING INTO MANHOLE BASE REQUIRED, ELBOW, TEE, PIPE, SUPPORT AS REQUIRED.



Standard Plate Library City of Monticello

Title: **Outside Drop Section for Sanitary Manhole**

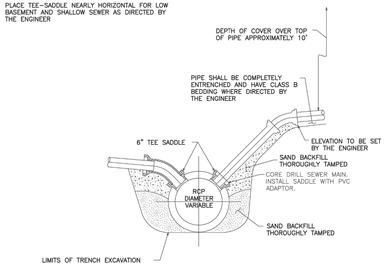
Date: 03-04 | Revised: 03-15 | Plate No. 3002

NOTES:

ALL SERVICE CONNECTIONS INCLUDING NECESSARY BENDS AND SPECIAL FITTINGS SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER LINEAL FOOT OF SERVICE. NO ADDITIONAL COMPENSATION SHALL BE ALLOWED FOR THE SADDLES, CONCRETE ENCASEMENT, AND BENDS.

TYPICAL SERVICE WHEN COVER OVER TOP OF SEWER IS 12' OR MORE.

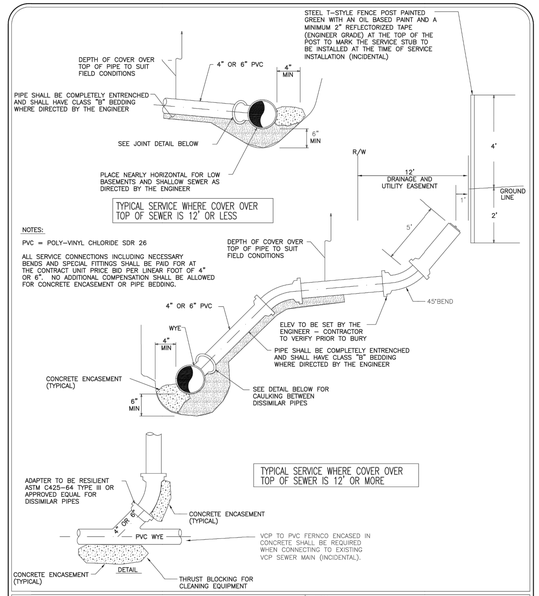
PLACE TEE-SADDLE NEARLY HORIZONTAL FOR LOW BASEMENT AND SHALLOW SEWER AS DIRECTED BY THE ENGINEER



Standard Plate Library City of Monticello

Title: **Typical Service Connection for RCP Sanitary Sewer**

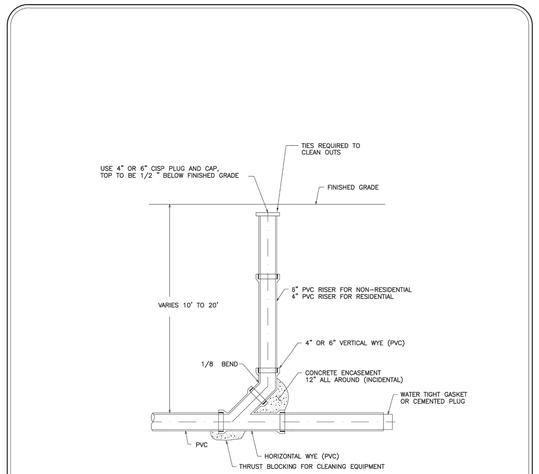
Date: 03-05 | Revised: 03-15 | Plate No. 3003



Standard Plate Library City of Monticello

Title: **Typical Service Connection**

Date: 03-05 | Revised: 03-15 | Plate No. 3004

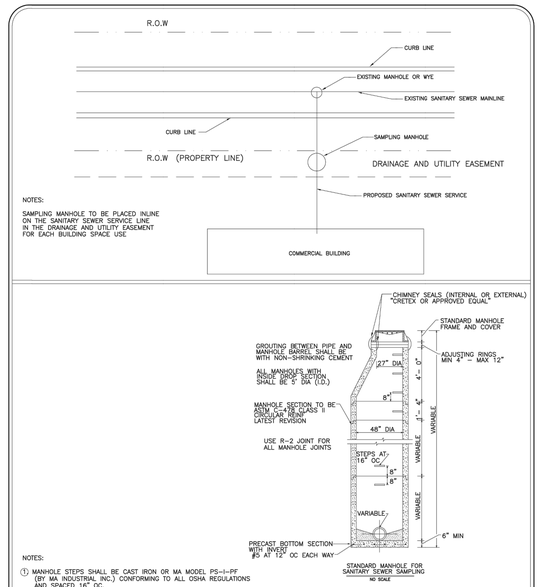


1. PAYMENT FOR 6" RISER PIPE, 6" VERTICAL WYE 45° BEND AND PLUG WILL BE PAID FOR AT UNIT PRICE BID PER EACH.
2. CLEAN-OUTS REQUIRED AT 70' INTERVALS FROM MAIN SEWER LINE.

Standard Plate Library City of Monticello

Title: **Sanitary Clean-Out**

Date: 03-05 | Revised: 03-15 | Plate No. 3006



NOTES:

SAMPLING MANHOLE TO BE PLACED INLINE ON THE SANITARY SEWER SERVICE LINE IN THE DRAINAGE AND UTILITY EASEMENT FOR EACH BUILDING SPACE USE

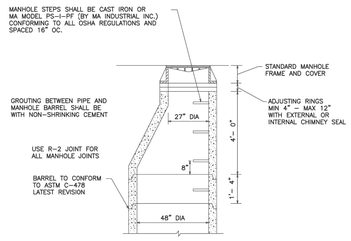
NOTES:

① MANHOLE STEPS SHALL BE CAST IRON OR MA MODEL PS-I-PF (BY MA INDUSTRIAL INC.) CONFORMING TO ALL OSHA REGULATIONS AND SPACED 16" OC.

Standard Plate Library City of Monticello

Title: **Standard Sanitary Sewer Sampling Manhole**

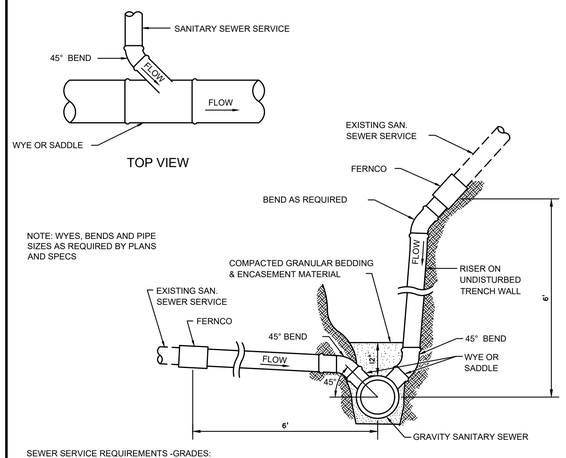
Date: 03-07 | Revised: 03-15 | Plate No. 3007



Standard Plate Library City of Monticello

Title: **Cone Section, Casting Steps, and Adjusting Rings**

Date: 03-05 | Revised: 03-15 | Plate No. 1001



SEWER SERVICE REQUIREMENTS -GRADES:
MINIMUM - 1.0% (1/8" PER FT.)
OPTIMUM - 2.0% (1/4" PER FT.)
MAXIMUM - 12.5%

NOTE: WHERE NO EXISTING SEWER IS INPLACE, INSTALL PVC CAP AND MARK LOCATION WITH 4"X4"X6" TIMBER & 3/8" X 4' STEEL ROD BURY 6" BELOW FINISHED GRADE.

SANITARY SEWER SERVICE WITH RISER

N.T.S.

REV NO.	DATE	DESCRIPTION
-	09/07/2022	DRAWINGS ISSUED TO CITY
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2	07/26/2024	UPDATED WITH NEW LAYOUT
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DATE: 12/11/2024
DESIGN BY: MJM
DRAWN BY: MJM
CHECKED BY: CJD
DWG FILE: DETAILS
FILE NO.: 21-0300.00

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.

Signed: _____ Lic. No. _____

Date: _____

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LAND SURVEYING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES
13075 FIRST STREET | BECKER, MN 55308-9322
TEL: 763-262-9822 | FAX: 763-262-9844

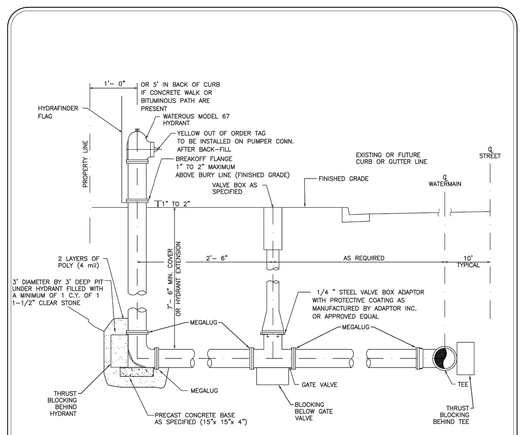
MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

DETAILS

SHEET NO.

C9.3

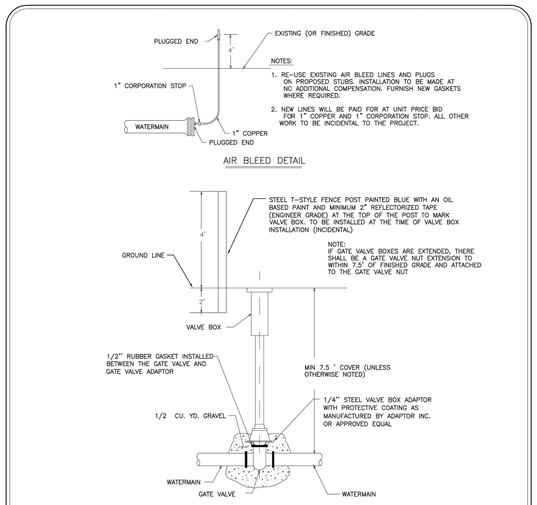
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Standard Plate Library
City of Monticello

Title: **Typical Hydrant Installation**

Date: 03–05 | Revised: 03–17 | Plate No. 2001



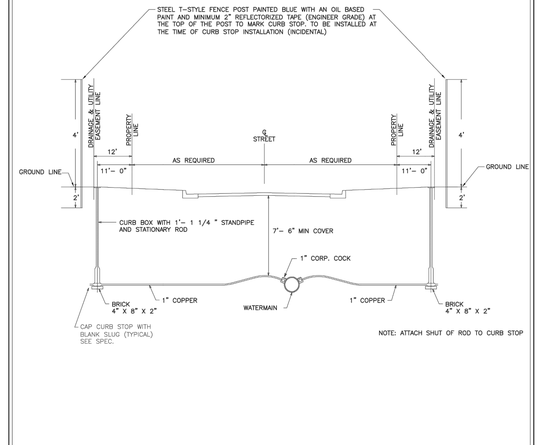
AIR BLEED DETAIL

VALVE BOX INSTALLATION

Standard Plate Library
City of Monticello

Title: **Air Bleed Detail And Valve Box Installation**

Date: 03–05 | Revised: 03–15 | Plate No. 2003



Standard Plate Library
City of Monticello

Title: **Typical Water Service**

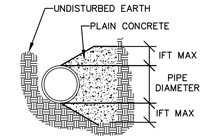
Date: 03–05 | Revised: 03–15 | Plate No. 2006

BEARING AREA

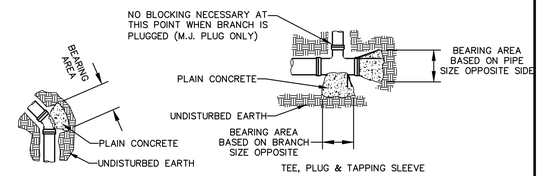
SIZE OF PIPE	90° BEND	45° BEND	22.5° BEND	11.25° BEND	TEES, PLUGS & TAPPING SLEEVE
4IN	2 SQ. FT.	2 SQ. FT.	2 SQ. FT.	2 SQ. FT.	2 SQ. FT.
6IN	3 SQ. FT.	2 SQ. FT.	2 SQ. FT.	2 SQ. FT.	3 SQ. FT.
8IN	5 SQ. FT.	3 SQ. FT.	2 SQ. FT.	2 SQ. FT.	4 SQ. FT.
10IN	8 SQ. FT.	4 SQ. FT.	3 SQ. FT.	2 SQ. FT.	6 SQ. FT.
12IN	11 SQ. FT.	6 SQ. FT.	3 SQ. FT.	2 SQ. FT.	8 SQ. FT.

NOTE:
TEE & PLUG BLOCKING SHOWN; TAPPING SLEEVE BLOCKING SIMILAR

CONCRETE NOT TO COVER BOLTS ON FITTINGS



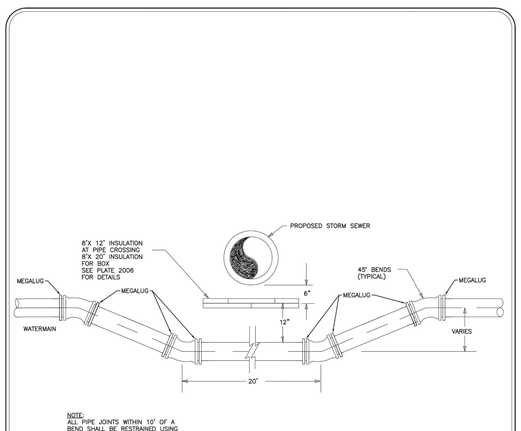
TYPICAL SECTION



TYPICAL BEND

TEE, PLUG & TAPPING SLEEVE

WATERMAIN THRUST BLOCK
N.T.S.

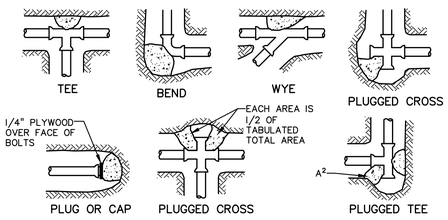


NOTE:
ALL PIPE JOINTS WITHIN 10' OF A BEND SHALL BE RESTRAINED USING TIE RODS.

Standard Plate Library
City of Monticello

Title: **Watermain Offset**

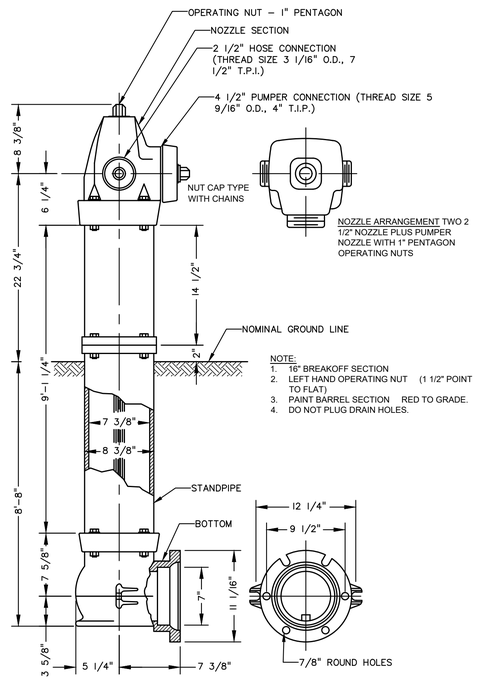
Date: 03–05 | Revised: 03–17 | Plate No. 2005



NOMINAL FITTING SIZE (INCHES)	TEE, WYE, PLUG OR CAP	90° BEND, PLUGGED CROSS	TEE PLUGGED ON RUN		45° BEND	22 1/2° BEND	11 1/4° BEND
			A1	A2			
4	1.0	1.4	1.9	1.4	1.0	---	---
6	2.1	3.0	4.3	3.0	1.6	1.0	---
8	3.8	5.3	7.6	5.4	2.9	1.5	1.0
10	5.9	8.4	11.8	8.4	4.6	2.6	1.2
12	8.5	12.0	17.0	12.0	6.6	3.4	1.7
14	11.5	16.3	23.0	16.3	8.9	4.6	2.3
16	15.0	21.3	30.0	21.3	11.6	6.0	3.0
18	19.0	27.0	38.0	27.0	14.6	7.6	3.8
20	23.5	33.3	47.0	33.3	18.1	9.4	4.7
24	34.0	48.0	68.0	48.0	26.2	13.6	6.8

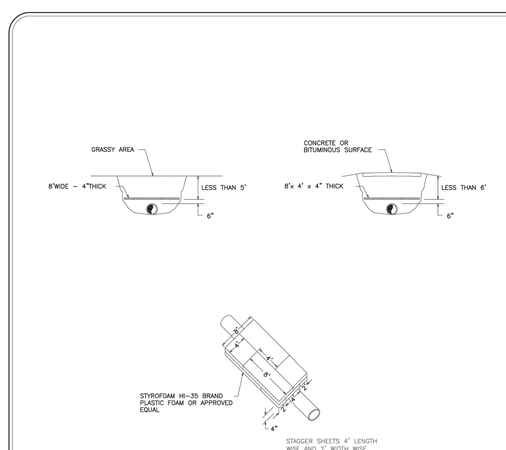
NOTE:
1. CONCRETE THRUST BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH.
2. KEEP CONCRETE CLEAR OF JOINT AND ACCESSORIES.
3. IF NOT SHOWN ON PLANS, REQUIRED BEARING AREAS AT FITTING SHALL BE AS INDICATED ABOVE, ADJUSTED IF NECESSARY, TO CONFORM TO THE TEST PRESSURE(S) AND ALLOWABLE SOIL BEARING STRESS(ES).
4. BEARING AREAS AND SPECIAL BLOCKING DETAILS SHOWN ON PLANS TAKE PRECEDENCE OVER BEARING AREAS AND BLOCKING DETAILS SHOWN IN THIS STANDARD DETAIL.
5. ABOVE BEARING AREAS BASED ON TEST PRESSURE OF 150 P.S.I. AND AN ALLOWABLE SOIL BEARING STRESS OF 2000 POUNDS PER SQUARE FOOT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING STRESSES, USE THE FOLLOWING EQUATION:
BEARING AREA = (TEST PRESSURE/150) X (2000/SOIL BEARING STRESS) X (TABLE VALUE).

THRUST BLOCKING DETAIL
N.T.S.



NOTE:
1. 16" BREAKOFF SECTION
2. LEFT HAND OPERATING NUT (1 1/2" POINT TO FLAT)
3. PAINT BARREL SECTION RED TO GRADE.
4. DO NOT PLUG DRAIN HOLES.

HYDRANT DETAIL
N.T.S.



NOTE: INSULATION REQUIRED FOR WATERMAIN WITH LESS THAN 5' COVER IN GRASSY AREAS AND 6' COVER UNDER PAVED SURFACES.

Standard Plate Library
City of Monticello

Title: **Insulation Detail**

Date: 03–05 | Revised: 03–15 | Plate No. 2004

REV NO.	DATE	DESCRIPTION
-	09/07/2022	DRAWINGS ISSUED TO CITY
1	09/19/2022	REVISED PER PUD REVIEW
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3	12/11/2024	REVISED PER CITY COMMENTS

DATE: 12/11/2024
DESIGN BY: MJM
DRAWN BY: MJM
CHECKED BY: CJD
DWG FILE: DETAILS
FILE NO.: 21-0300.00

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.

Signed: _____ Lic. No. _____
Date: _____

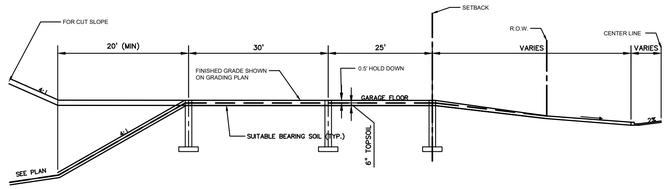
BOGART, PEDERSON & ASSOCIATES, INC.
LAND SURVEYING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES
13076 FIRST STREET | BECKER, MN 55308-9322
TEL: 763-261-3822 | FAX: 763-261-3844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

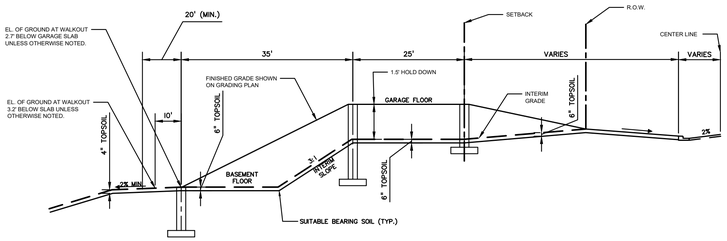
DETAILS

SHEET NO.
C9.4

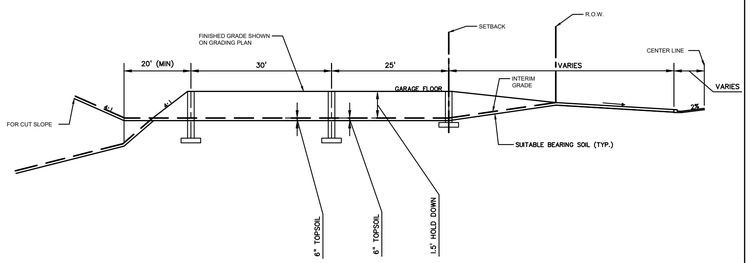
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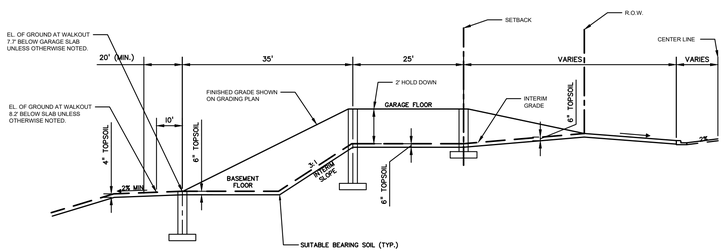
SLAB ON GRADE
N.T.S.



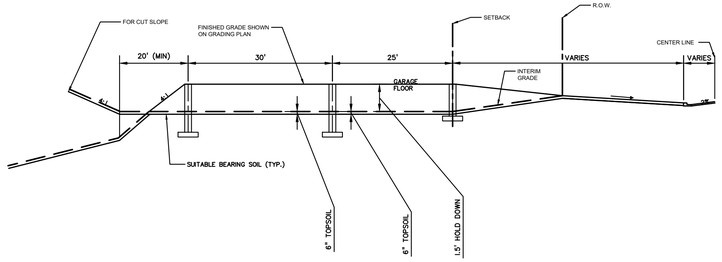
SPLIT ENTRY WALKOUT
N.T.S.



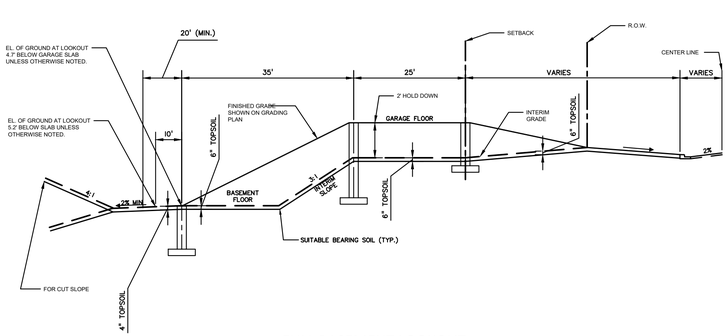
SPLIT ENTRY LOOKOUT
N.T.S.



FULL BASEMENT WALKOUT
N.T.S.



FULL BASEMENT
N.T.S.



FULL BASEMENT LOOKOUT
N.T.S.

HOUSE PAD GRADING HOLD DOWN DETAIL
N.T.S

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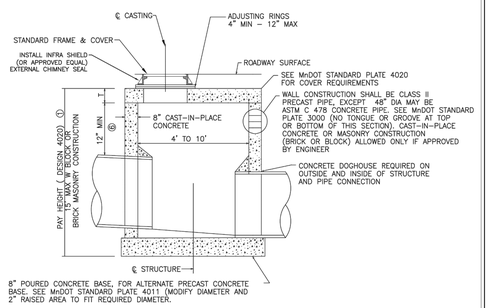
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MEADOWS AT PIONEER PARK
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City of Monticello, Wright County, MN

DETAILS

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C9.5

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① REFER TO STANDARD PLANS FOR HEIGHT AND DIAMETER REQUIRED.

② MANHOLE STEPS SHALL BE CAST IRON OR MA MODEL PS-I-PF (BY MA INDUSTRIAL INC.) CONFORMING TO ALL OSHA REGULATIONS AND SPACED 16" OC.

③ MINIMUM STEEL REINFORCEMENT

④ EQUIVALENT STEEL AREA IN WIRE MESH MAY BE USED

⑤ GENERAL DIMENSIONS FOR CONCRETE APPLY TO BRICK AND CONCRETE MASONRY UNIT CONSTRUCTION ALSO, EXCEPT AS NOTED.

⑥ 12" MINIMUM FOR PRECAST, 3 BRICKS OR 1 BLOCK MINIMUM FOR MASONRY CONSTUCTION

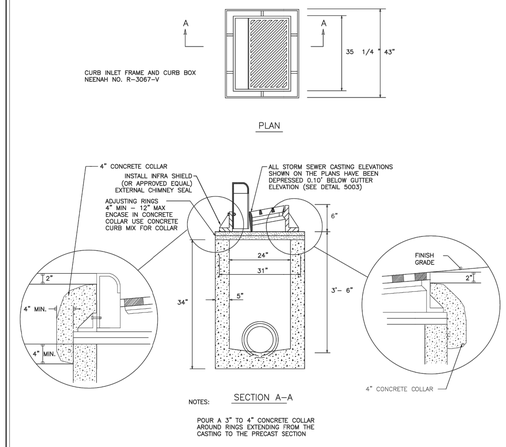
⑦ REINFORCEMENT AS PER MnDOT SPEC 3301, GRADE 60.



Standard Plate Library City of Monticello

Title: **Standard Manhole for Storm Sewer**

Date: 03-05 | Revised: 03-17 | Plate No. 4001



NOTES:

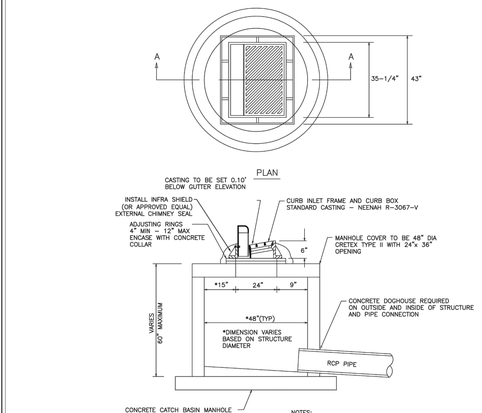
POUR A 3" TO 4" CONCRETE COLLAR AROUND RINGS EXTENDING FROM THE CASTING TO THE PRECAST SECTION

CATCH BASINS LOCATED IN DRIVEWAYS SHALL BE TYPE MnDOT DESIGN H. THE CASTING SHALL BE NEENAH R-3508-A2.

Standard Plate Library City of Monticello

Title: **Standard Catch Basin**

Date: 03-05 | Revised: 03-17 | Plate No. 4002



NOTES:

1. BASE TO BE GROUTED TO FORM A SMOOTH INVERT TO OUTLET.
2. PIPE CUT-OUTS TO BE LOCATED WHERE REQUIRED.

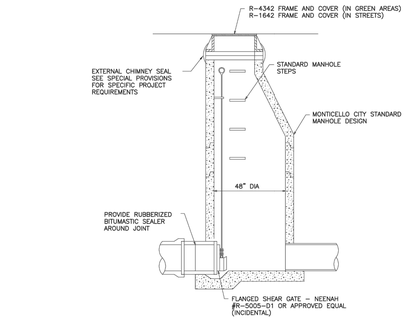
CATCH BASIN MANHOLES REQUIRED IN GREEN SPACES SHALL BE CONSTRUCTED OF PRECAST CONCRETE ONLY IN ACCORDANCE WITH Mn/DOT STANDARD PLATE 4006L. THE CASTING SHALL BE NEENAH R-4342.

CATCH BASIN MANHOLES LOCATED IN DRIVEWAYS SHALL BE CONSTRUCTED WITH AN ECCENTRIC TOP SLAB WITH A 27" ROUND OPENING. THE CASTING SHALL BE NEENAH R-3508-A2.

Standard Plate Library City of Monticello

Title: **Catch Basin Manhole**

Date: 03-05 | Revised: 03-17 | Plate No. 4003



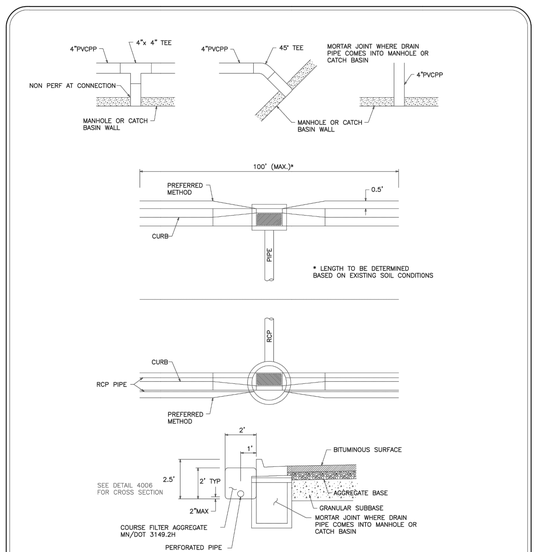
NOTES:

1. SHEAR GATE TO BE BOLTED TO PIPE AND MAINTAINED AT HALF OPEN POSITION. USE S.S. BOLTS AND NUTS TO FASTEN SHEAR GATE TO CONCRETE PIPE.
2. SECURE HANDLE WITH LOCK & CHAIN TO KEEP OPEN AT SPECIFIED DEPTHS.
3. PAINT SHEAR GATE WITH COAL TAR EPOXY.

Standard Plate Library City of Monticello

Title: **Standard Manhole with Shear Gate**

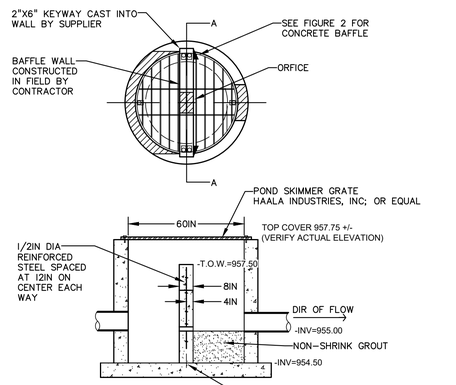
Date: 03-05 | Revised: 03-15 | Plate No. 4004



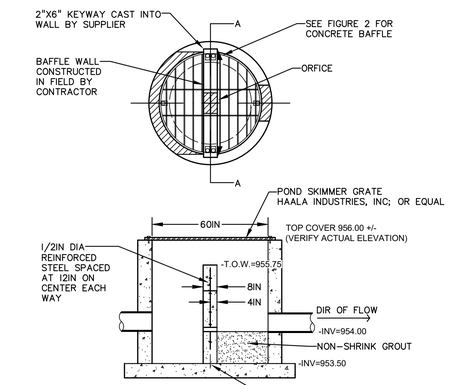
Standard Plate Library City of Monticello

Title: **Special Details PVCPP Subdrain**

Date: 03-05 | Revised: 03-15 | Plate No. 4005



STORMWATER CONTROL STRUCTURE 1
N.T.S.



STORMWATER CONTROL STRUCTURE 2
N.T.S.

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DWG FILE: DETAILS
FILE NO.: 21-0300.00

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Signed: _____ Lic. No. _____

Date: _____

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13076 FIRST STREET | BECKER, MN 55308-9322
TEL: 763-261-3822 | FAX: 763-262-9844

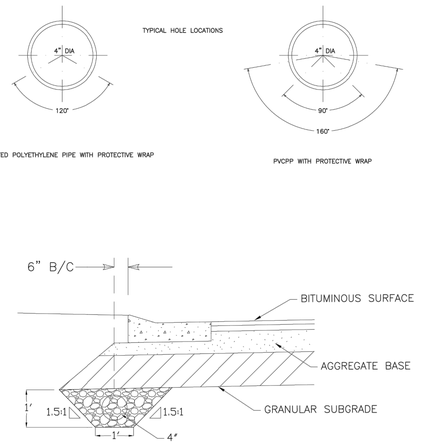
MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

DETAILS

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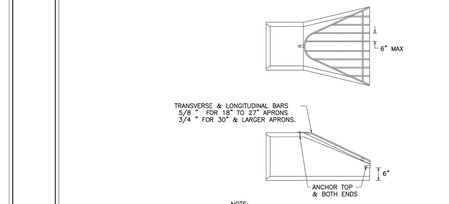


① 4" PERFORATED P.E. PIPE WITH FABRIC (TYPICAL) ENCASED WITH COARSE AGGREGATE(MNDOT 3149.2H). INSTALL WHERE CLAY SOILS ARE ENCOUNTERED IN THE ROADWAY SUBGRADE, LOW POINTS IN ROADWAY OR AS DIRECTED BY THE ENGINEER.

Standard Plate Library City of Monticello

Title: **Perforated P.E. Pipe With Fabric**

Date: 03–05 | Revised: 03–15 | Plate No. 4006



NOTE:

1. ALL TRASH GUARDS SHALL BE GALVANIZED AFTER FABRICATION PER MNDOT SPEC. 3392 & 3394.
2. APPLIES TO FLARED END SECTIONS 12" OR LARGER.
3. ALL NUTS AND BOLT ATTACHING TRASH GUARD TO THE FLARED END SECTION SHALL BE LEFT EXPOSED

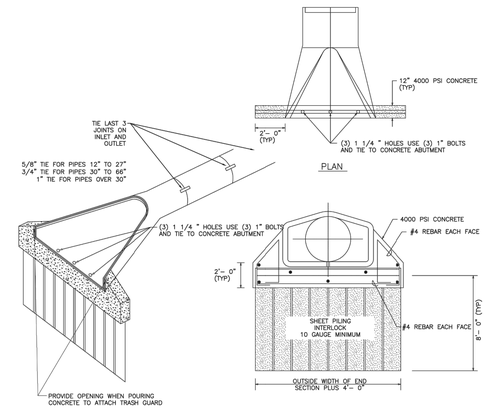
Standard Plate Library City of Monticello

Title: **Trash Guard for End Section**

Date: 03–05 | Revised: 03–15 | Plate No. 4007

NOTE:

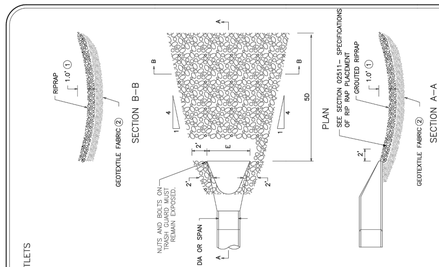
THIS DRAWING IS TYPICAL FOR ALL FLARED END SECTIONS 24" OR LARGER SHEET PILING AS SHOWN SHALL BE CONSIDERED INCIDENTAL TO FLARED END. NUTS AND BOLTS ON TRASH GUARD MUST REMAIN EXPOSED.



Standard Plate Library City of Monticello

Title: **Piling for Flared End Section**

Date: 03–05 | Revised: 03–17 | Plate No. 4008



① FOR PIPES GREATER THAN OR EQUAL TO 48", USE 2.0'

② THE FABRIC SHOULD COVER THE AREA OF THE RIPRAP AND EXTEND UNDER THE CULVERT APPRON 3 FEET.

RCP AT OUTLETS

TABLE OF QUANTIES

RIPRAP AT RCP OUTLETS

DIA ROUND PIPE	SPAN ELLIPTICAL PIPE	CLASS III D 50 = 8" 15" DEPTH RIPRAP	CLASS III D 50 = 8" 7.5" DEPTH GRANULAR FILTER	CLASS IV D 50 = 9" 18" DEPTH RIPRAP	CLASS IV D 50 = 9" 9" DEPTH GRANULAR FILTER	CLASS V D 50 = 12" 24" DEPTH RIPRAP	CLASS V D 50 = 12" 12" DEPTH GRANULAR FILTER
(IN)	(IN)	(CU. YD)	(CU. YD)	(CU. YD)	(CU. YD)	(CU. YD)	(CU. YD)
12	18	1.1	0.5	1.7	0.8	4.4	1.7
15	24	1.5	0.7	2.3	1.1	5.8	2.3
18	29	2.1	1.0	3.2	1.5	8.1	3.2
24	38	3.4	1.6	5.2	2.4	13.2	5.2
30	48	5.0	2.3	7.6	3.5	19.2	7.6
36	58	6.9	3.2	10.5	4.8	26.5	10.5
42	67	9.1	4.1	13.8	6.3	34.9	13.8
48	77	11.6	5.3	17.6	8.0	44.5	17.6
54	86	14.4	6.6	21.8	9.9	55.2	21.8
60	96	17.6	8.1	26.7	12.1	67.6	26.7
66	106	21.3	9.8	32.3	14.6	81.8	32.3
72	115	25.3	11.6	38.4	17.3	97.2	38.4

RIPRAP AT RCP–A OR BOXES OF EQUIVALENT SPAN WIDTH

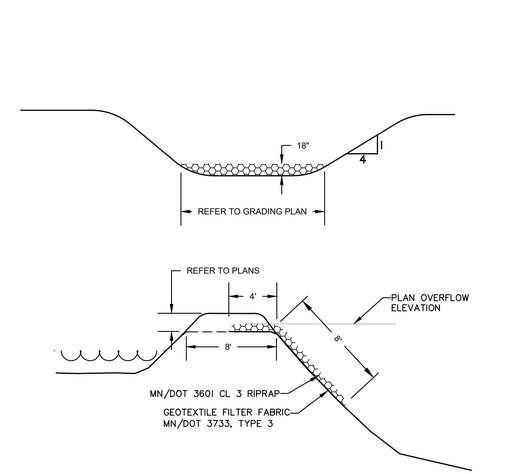
SPAN ELLIPTICAL PIPE	CLASS III D 50 = 8" 15" DEPTH RIPRAP	CLASS III D 50 = 8" 7.5" DEPTH GRANULAR FILTER	CLASS IV D 50 = 9" 18" DEPTH RIPRAP	CLASS IV D 50 = 9" 9" DEPTH GRANULAR FILTER	CLASS V D 50 = 12" 24" DEPTH RIPRAP	CLASS V D 50 = 12" 12" DEPTH GRANULAR FILTER
(IN)	(CU. YD)	(CU. YD)	(CU. YD)	(CU. YD)	(CU. YD)	(CU. YD)
18	2.1	1.0	3.2	1.5	8.1	3.2
23	3.0	1.4	4.6	2.1	11.6	4.6
29	4.1	1.9	6.3	2.9	15.8	6.3
36	5.4	2.5	8.3	3.8	20.8	8.3
43	6.9	3.2	10.6	4.8	26.6	10.6
58	10.5	4.8	16.2	7.3	40.5	16.2
72	14.5	6.6	22.3	10.1	55.8	22.3
87	19.0	8.6	29.3	13.2	73.4	29.3
101	23.8	10.8	36.7	16.5	91.8	36.7
115	29.1	13.2	44.9	20.2	112.2	44.9
130	34.8	15.8	53.6	24.1	134.0	53.6
144	41.0	18.6	63.2	28.4	158.0	63.2

NOTE: REQUIREMENTS FOR RIPRAP SIZE, THICKNESS, WILL BE DESIGNATED IN PLANS.

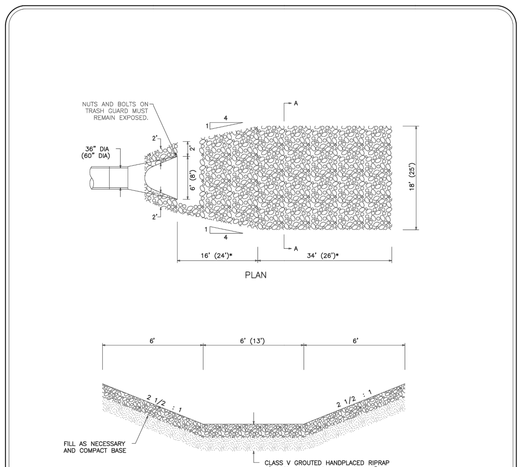
Standard Plate Library City of Monticello

Title: **Riprap Detail**

Date: 03–05 | Revised: 03–15 | Plate No. 4009



EMERGENCY OVERFLOW WEIR DETAIL
N.T.S.



* PLAN AND SECTION MAY BE MODIFIED AT THE DISCRETION OF THE CITY ENGINEER WHEN CONDITIONS SUCH AS PIPE VELOCITIES DO NOT REQUIRE SUCH EXTENSIVE RIP RAP.

Standard Plate Library City of Monticello

Title: **Spillway Section**

Date: 03–05 | Revised: 03–15 | Plate No. 4010

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-	09/07/2022	DRAWINGS ISSUED TO CITY
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CHECKED BY: ____ CJD
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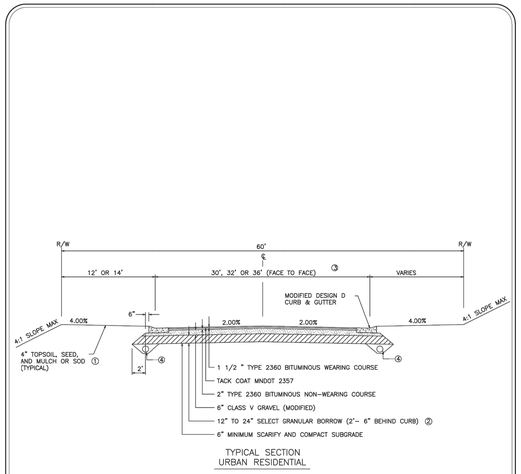
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MEADOWS AT PIONEER PARK
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TYPICAL SECTION
URBAN RESIDENTIAL

① 2 ROLLS OF SOD TO BE PLACED BEHIND CURB AND SIDEWALK/TRAIL.

② THE USE AND THICKNESS OF SELECT GRANULAR BORROW IS BASED ON EXISTING SOIL CONDITIONS AS DETERMINED BY THE CITY ENGINEER.

③ STREET WIDTH TO BE DETERMINED BY THE CITY ENGINEER.

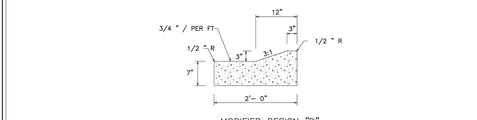
④ 6" PERFORATED P.E. PIPE WITH FABRIC. INSTALL WHERE CLAY SOILS ARE ENCOUNTERED IN THE ROADWAY SUBGRADE OR AS DIRECTED BY THE ENGINEER.

SEE PLATE 4006 FOR DETAILS

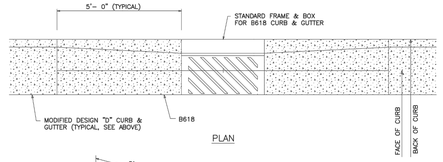
Standard Plate Library City of Monticello

Title: **Typical Street Residential (Minor)**

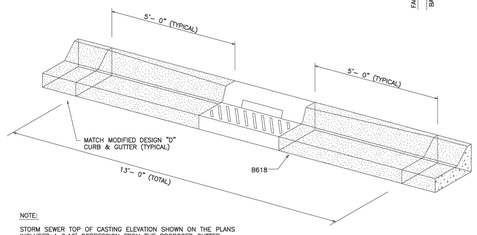
Date: 03–05 | Revised: 03–17 | Plate No. 5002



MODIFIED DESIGN "D"



PLAN

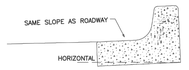


NOTE:
STORM SEWER TOP OF CASTING ELEVATION SHOWN ON THE PLANS INCLUDES A 0.10' DEPRESSION FROM THE PROPOSED GUTTER GRADE. THE CONCRETE CURB SHOULD BE TRANSITIONED FROM THE PROPOSED GUTTER GRADE TO THE CASTING ELEVATION 5 FEET ON EACH SIDE OF THE CENTER OF THE CASTING.

Standard Plate Library City of Monticello

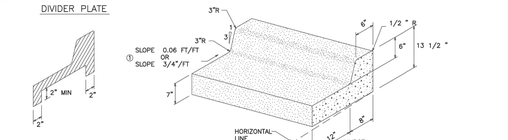
Title: **Concrete Curb & Gutter at Catch Basin**

Date: 03–05 | Revised: 03–15 | Plate No. 5004



(FORMS MAY BE TILTED)
REVERSE SLOPE GUTTER SECTION

DIVIDER PLATE

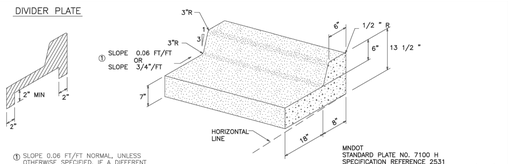


① SLOPE 0.06 FT/FT NORMAL, UNLESS OTHERWISE SPECIFIED. IF A DIFFERENT GUTTER SLOPE IS PERMITTED, THE FORM MAY BE TILTED

MNDOT STANDARD PLATE NO. 7100 H
SPECIFICATION REFERENCE 2531
CONCRETE – 0.0474 CU YDS / LIN FT (B612)
CONCRETE – 21.1 FT / CU. YDS. (B612)

B612 CONCRETE CURB & GUTTER

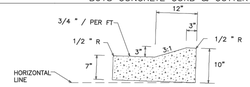
DIVIDER PLATE



① SLOPE 0.06 FT/FT NORMAL, UNLESS OTHERWISE SPECIFIED. IF A DIFFERENT GUTTER SLOPE IS PERMITTED, THE FORM MAY BE TILTED

MNDOT STANDARD PLATE NO. 7100 H
SPECIFICATION REFERENCE 2531
CONCRETE – 0.0582 CU YDS / LIN FT (B618)
CONCRETE – 17.2 FT / CU.YDS. (B618)

B618 CONCRETE CURB & GUTTER

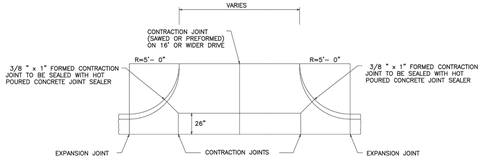


MODIFIED DESIGN "D" CURB & GUTTER

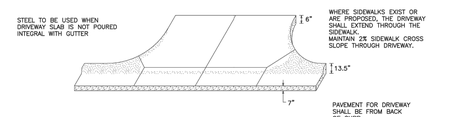
Standard Plate Library City of Monticello

Title: **Concrete Curb & Gutter for Streets**

Date: 03–05 | Revised: 03–15 | Plate No. 5005



PLAN

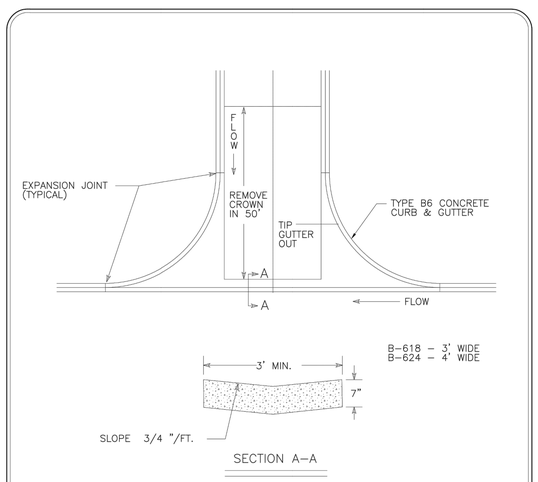


SECTION

Standard Plate Library City of Monticello

Title: **Residential Driveway Entrance**

Date: 03–05 | Revised: 03–17 | Plate No. 5007

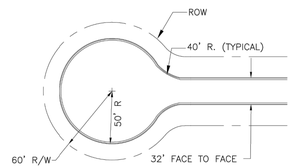


SECTION A–A

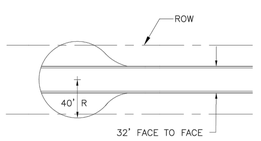
Standard Plate Library City of Monticello

Title: **Typical Concrete Valley Gutter**

Date: 03–05 | Revised: 03–15 | Plate No. 5009



(TYPICAL DESIGN)



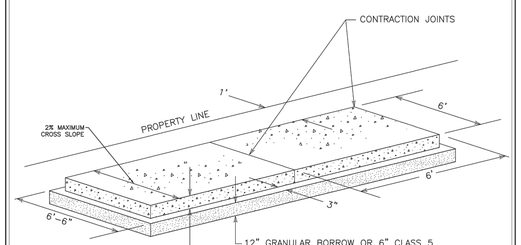
(TEMPORARY DESIGN)

NOTE: ALL TEMPORARY CUL–DE–SACS SHALL CONFORM TO TYPICAL STREET SECTION DETAILS.
NOTE: DESIGN "D" CURB AND GUTTER TO BE USED WITHIN TEMPORARY CUL–DE–SACS.

Standard Plate Library City of Monticello

Title: **Typical Cul-De-Sac**

Date: 03–05 | Revised: 03–15 | Plate No. 5010



BOULEVARD WIDTH VARIES(AVERAGE 8')

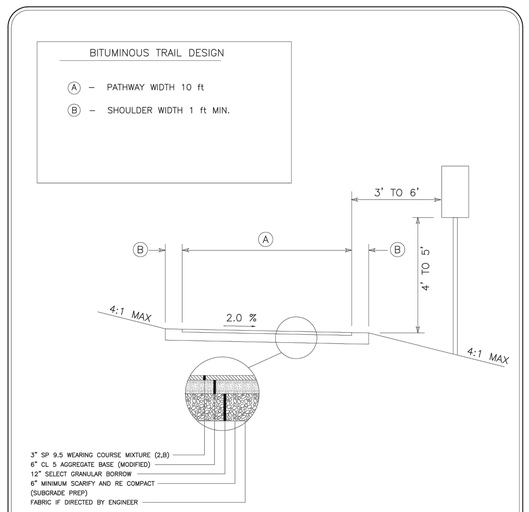
SIDEWALK DIMENSIONS

WIDTH – 6'
DEPTH – 6" FOR NEW DEVELOPMENTS
– *4" MINIMUM FOR EXISTING AREAS, 6" AT DRIVEWAYS AND CROSSWALKS
GRANULAR BORROW DEPTH – 12" GRANULAR BORROW OR 6" CLASS 5
CONTRACTION JOINTS – 6' INTERVALS
EXPANSION JOINTS – 60' INTERVALS (APPROX.)
*MATCH EXISTING DEPTH, 4" MINIMUM
INSTALL PEDESTRIAN CURB RAMPS AT ROADWAY INTERSECTIONS

Standard Plate Library City of Monticello

Title: **Typical Sidewalk**

Date: 03–05 | Revised: 03–17 | Plate No. 5012



NOTES:
1. TRAIL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE MOST RECENT EDITION OF THE CITY OF MONTICELLO GENERAL SPECIFICATIONS AND STANDARD DETAIL PLATES.
2. PEDESTRIAN RAMPS SHALL BE CONSTRUCTED WITH TRUNCATED DOMES AND CONFORM TO ADA REQUIREMENTS.
3. MODIFY SURFACING, BASE, AND SUBGRADE DESIGN BASED ON EXPECTED VEHICULAR USE AND SUBGRADE SOILS.

Standard Plate Library City of Monticello

Title: **Typical Trail Section**

Date: 03–05 | Revised: 03–15 | Plate No. 5013

REV NO.	DATE	DESCRIPTION
-	09/07/2022	DRAWINGS ISSUED TO CITY
1	09/19/2022	REVISED PER PUD REVIEW
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3	12/11/2024	REVISED PER CITY COMMENTS

DATE: 12/11/2024
DESIGN BY: MJM
DRAWN BY: MJM
CHECKED BY: CJD
DWG FILE: DETAILS
FILE NO.: 21-0300.00

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.

Signed: _____ Lic. No. _____

Date: _____

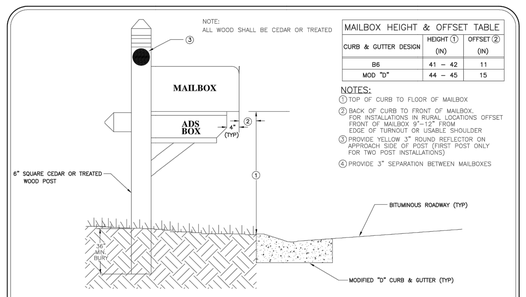
BOGART, PEDERSON & ASSOCIATES, INC.
LAND SURVEYING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES
13076 FIRST STREET | BECKER, MN 55308-9322
TEL: 763-261-4602 | FAX: 763-262-9844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

DETAILS

SHEET NO.
C9.8

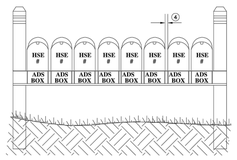
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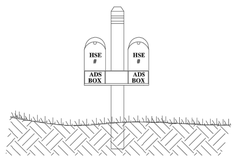
MAILBOX HEIGHT & OFFSET TABLE		
CURB & GUTTER DESIGN	HEIGHT ① (IN)	OFFSET ② (IN)
B6	41 – 42	11
MOD "D"	44 – 45	15

NOTES:
① TOP OF CURB TO FLOOR OF MAILBOX
② BACK OF CURB TO FRONT OF MAILBOX. FOR INSTALLATIONS IN RURAL LOCATIONS OFFSET FRONT OF MAILBOX 9"–12" FROM EDGE OF TURNOUT OR USABLE SHOULDER
③ PROVIDE YELLOW 3" ROUND REFLECTOR ON APPROACH SIDE OF POST (FIRST POST ONLY FOR TWO POST INSTALLATIONS)
④ PROVIDE 3" SEPARATION BETWEEN MAILBOXES

NOTE: MINIMUM 3 MAILBOXES TO MAXIMUM 8 MAILBOXES ON DOUBLE POST INSTALLATION

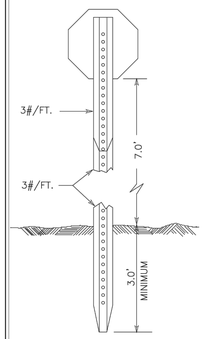


NOTE: 1 MAILBOX TO MAXIMUM 2 MAILBOXES ON SINGLE POST INSTALLATION



Standard Plate Library City of Monticello

Title: **Mailbox Detail New-Residential**
Date: 03–07 Revised: 03–15
Plate No. 5014



TRAFFIC SIGN SPECIFICATIONS

MATERIAL:

ALUMINUM SHALL BE 5052–H38 OR 6061–T6 ALLOY.
GAUGE SHALL BE: .080 ON THE LONGEST SIDE UP TO 30"
.100 ON THE LONGEST SIDE OVER 30"

REFLECTING SHEETING SHALL BE DIAMOND GRADE. ALL SIGNS CONFORM TO SECTIONS 2564 AND 3352, SIGNS AND MARKERS STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.

CHANNEL POST SPECIFICATIONS

GALVANIZED STEEL CHANNEL POSTS SHALL BE USED, 2.5 LB/FT POSTS SHOULD BE USED THAT ARE PUNCHED ON 1" CC. GALVANIZED POSTS SHALL BE OF THE 4–RIB DESIGN. POSTS ARE TO BE 7 FEET IN HEIGHT BETWEEN BOTTOM OF SIGN AND FINISHED GROUND.

BOLTS, NUTS, AND WASHERS

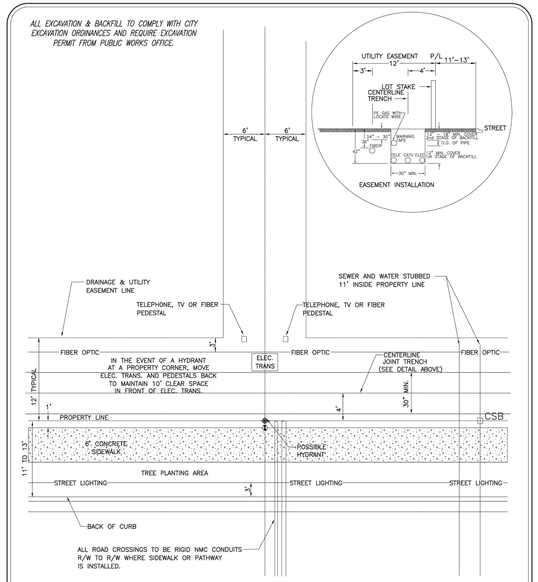
HARDWARE SHALL BE GRADE 5 MINIMUM AND BE GALVANIZED OR CADMIUM PLATED.

NOTE:
TYPICAL SIGN INSTALLATION WHEN STREET NAME SIGNS ARE NOT INSTALLED

Standard Plate Library City of Monticello

Title: **Typical Traffic Sign Installation**
Date: 03–05 Revised: 03–17
Plate No. 5016

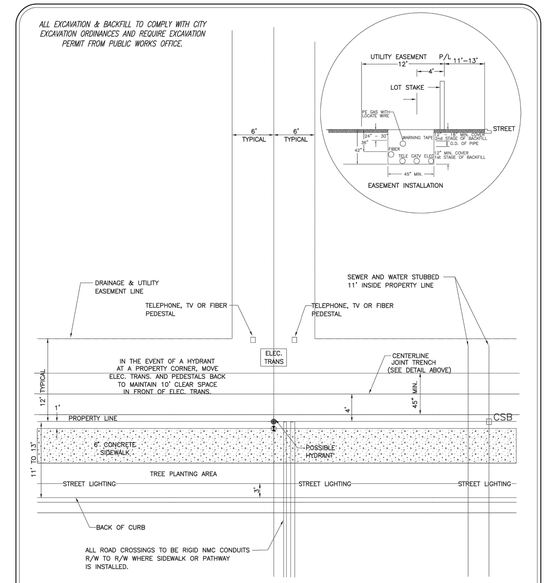
ALL EXCAVATION & BACKFILL TO COMPLY WITH CITY EXCAVATION ORDINANCES AND REQUIRE EXCAVATION PERMIT FROM PUBLIC WORKS OFFICE.



Standard Plate Library City of Monticello

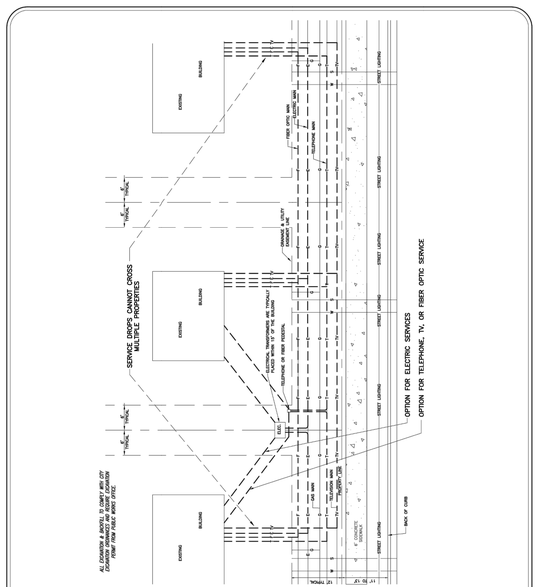
Title: **Joint Trench Utility for Existing Residential Developments**
Date: 03–05 Revised: 03–15
Plate No. 7001

ALL EXCAVATION & BACKFILL TO COMPLY WITH CITY EXCAVATION ORDINANCES AND REQUIRE EXCAVATION PERMIT FROM PUBLIC WORKS OFFICE.



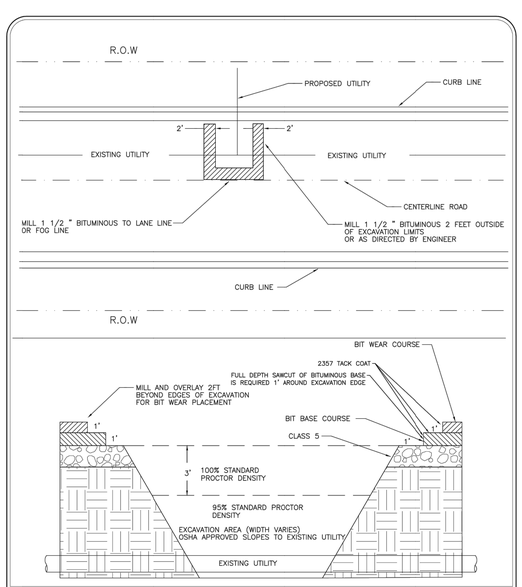
Standard Plate Library City of Monticello

Title: **Joint Trench Utility for New Residential Developments**
Date: 03–08 Revised: 03–15
Plate No. 7002



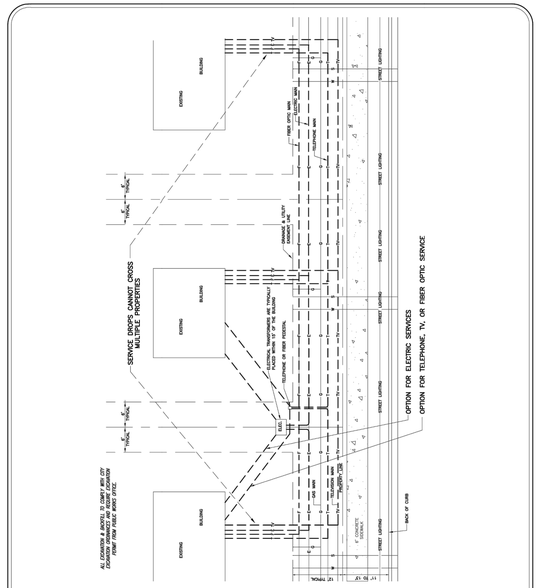
Standard Plate Library City of Monticello

Title: **Service Drop Locations for all Developments**
Date: 03–05 Revised: 03–15
Plate No. 7005



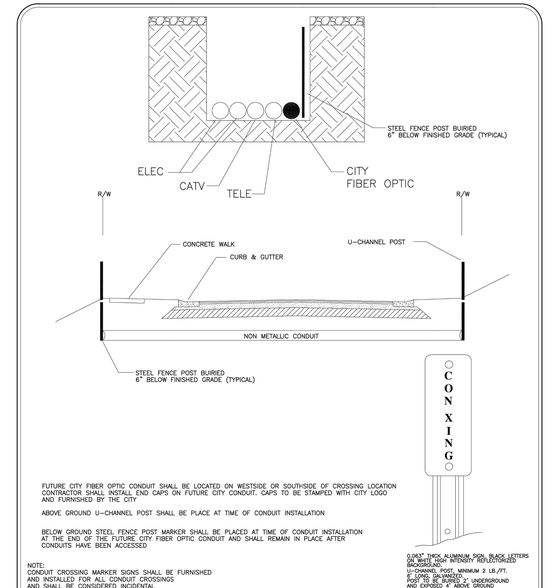
Standard Plate Library City of Monticello

Title: **Utility Excavation In City Streets 5 Years or Older**
Date: 03–05 Revised: 03–17
Plate No. 7006



Standard Plate Library City of Monticello

Title: **Service Drop Locations for all Developments**
Date: 03–05 Revised: 03–15
Plate No. 7005



Standard Plate Library City of Monticello

Title: **Conduit Crossing Markers**
Date: 02–06 Revised: 03–15
Plate No. 7010

REV NO.	DATE	DESCRIPTION
-	09/07/2022	DRAWINGS ISSUED TO CITY
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3	12/11/2024	REVISED PER CITY COMMENTS

DATE: 12/11/2024
DESIGN BY: MJM
DRAWN BY: MJM
CHECKED BY: CJD
DWG FILE: DETAILS
FILE NO.: 21-0300.00

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.

Signed: _____ Lic. No. _____
Date: _____

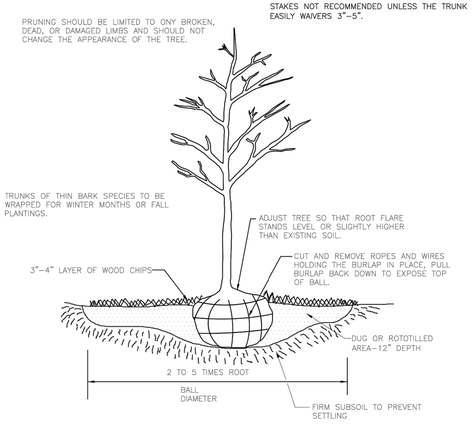
BOGART, PEDERSON & ASSOCIATES, INC.
LAND SURVEYING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES
13076 FIRST STREET BECKER, MN 55308-9322
TEL: 763-262-9822 FAX: 763-262-9844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

DETAILS

SHEET NO.
C9.9

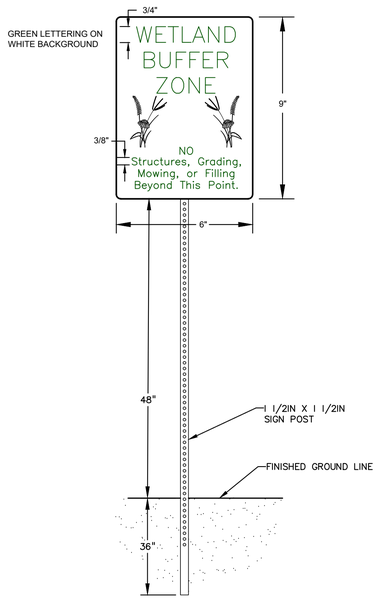
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Standard Plate Library
City of Monticello

Title: **Typical Tree Installation**

Date: 03–15
Revised: 03–15
Plate No. 6012



WETLAND BUFFER SIGN
N.T.S.

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DATE: 12/11/2024
DESIGN BY: MJM
DRAWN BY: MJM
CHECKED BY: CJD
DWG FILE: DETAILS
FILE NO.: 21-0300.00

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Signed: _____ Lic. No. _____
Date: _____

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13076 FIRST STREET, BECKER, MN 55308-9322
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MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

DETAILS

SHEET NO.
C9.10

12/4/2024 11:01 AM n:\projects current\21-0300.00 tamarack monticello nelson\Civil\Cad files\Cover\SWPPP\Details.dwg

CALL 48 HOURS BEFORE DIGGING:

GOPHER STATE ONE CALL

TWIN CITY AREA 651-454-0002
MINNESOTA TOLL FREE 1-800-252-1166

STREET LIGHTING GENERAL NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH MONTICELLO MUNICIPAL UTILITIES (MMU) AND THE ELECTRIC COMPANY TO EXTEND POWER TO THE PROPOSED LIGHTING SERVICE PANEL.
2. THE CONTRACTOR SHALL VERIFY LOCATION OF LIGHTING SERVICE PANEL/CONCRETE PAD WITH MMU.
3. CONTRACTOR SHALL PROVIDE UNDERGROUND 1-$\frac{1}{2}$" PVC SCHEDULE 40 CONDUIT WITH COPPER WIRE TO ADEQUATELY SUPPLY POWER TO THE PROPOSED STREET LIGHTS.
4. SEE ELEC DETAILS FOR REQUIREMENTS ON STREET LIGHTS, LIGHT BASES, CONDUIT, WIRING, AND GROUNDING.
5. ALL LIGHTING BASES, POLES, AND WIRING TO BE INSTALLED BY MMU

LEGEND:

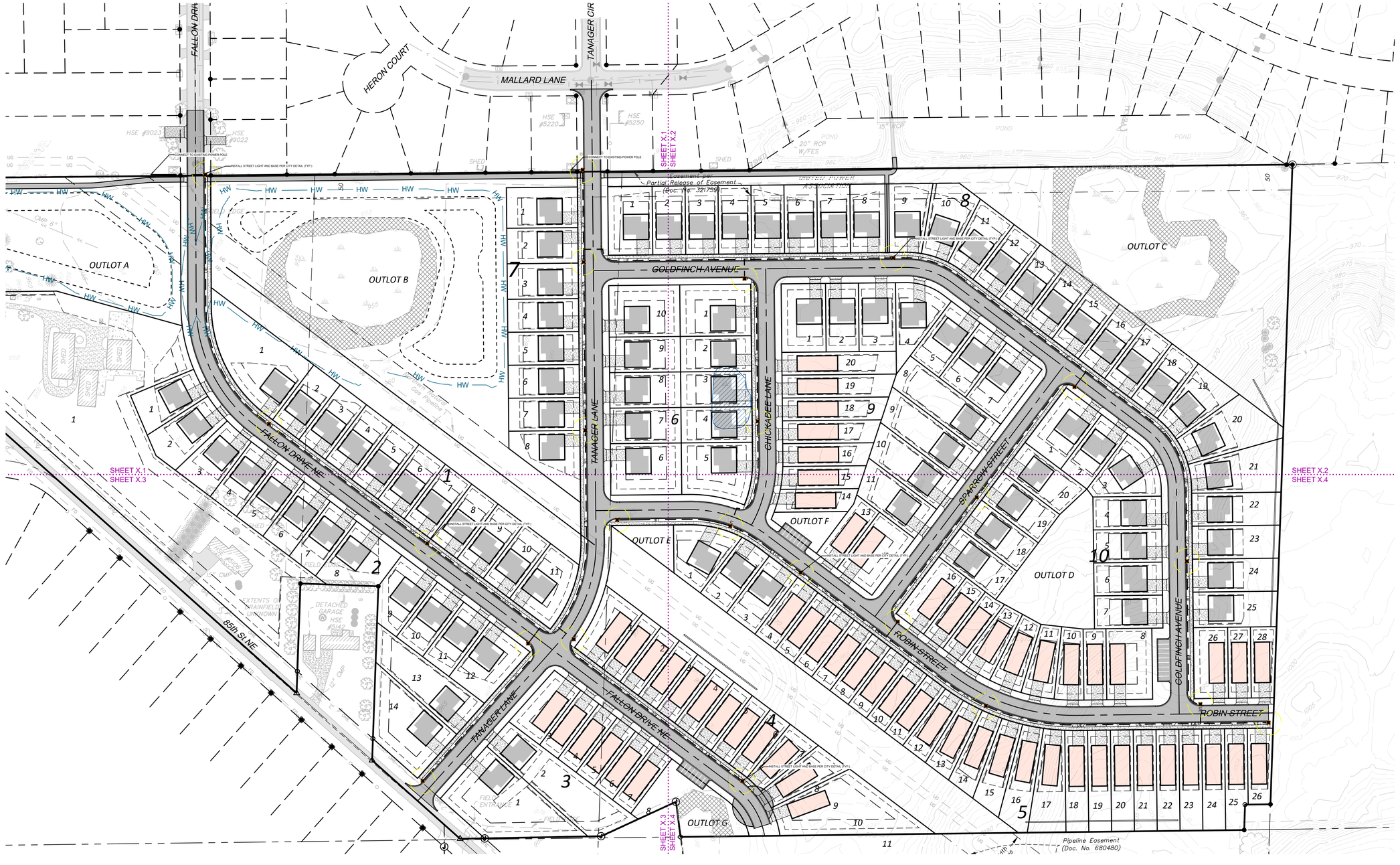
FUTURE STREET LIGHT

UE — PROPOSED UNDERGROUND ELECTRIC CONDUIT/ LINE

N

0 100'

SCALE: 1" = 100'



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DATE: 12/11/2024
DESIGN BY: MJM
DRAWN BY: MJM
CHECKED BY: CJD
DWG FILE: LIGHTING PLAN
FILE NO.: 21-0300.00

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Signed: _____ Lic. No. _____

Date: _____

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CIVIL ENGINEERING
ENVIRONMENTAL SERVICES
13079 FIRST STREET, BECKER, MN 55308-9322
TEL: 763-262-9622 FAX: 763-262-9844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

LIGHTING OVERALL PLAN

SHEET NO.

C10.0

12/24/2024 11:02 AM n:\projects current\21-0300.00 tamarack monticello midwest\Civil\Land Plans\Lighting Plan.dwg

STREET LIGHTING GENERAL NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH MONTICELLO MUNICIPAL UTILITIES (MMU) AND THE ELECTRIC COMPANY TO EXTEND POWER TO THE PROPOSED LIGHTING SERVICE PANEL.
2. THE CONTRACTOR SHALL VERIFY LOCATION OF LIGHTING SERVICE PANEL/CONCRETE PAD WITH MMU.
3. CONTRACTOR SHALL PROVIDE UNDERGROUND 1-$\frac{1}{2}$" PVC SCHEDULE 40 CONDUIT WITH COPPER WIRE TO ADEQUATELY SUPPLY POWER TO THE PROPOSED STREET LIGHTS.
4. SEE ELEC DETAILS FOR REQUIREMENTS ON STREET LIGHTS, LIGHT BASES, CONDUIT, WIRING, AND GROUNDING.
5. ALL LIGHTING BASES, POLES, AND WIRING TO BE INSTALLED BY MMU

LEGEND:

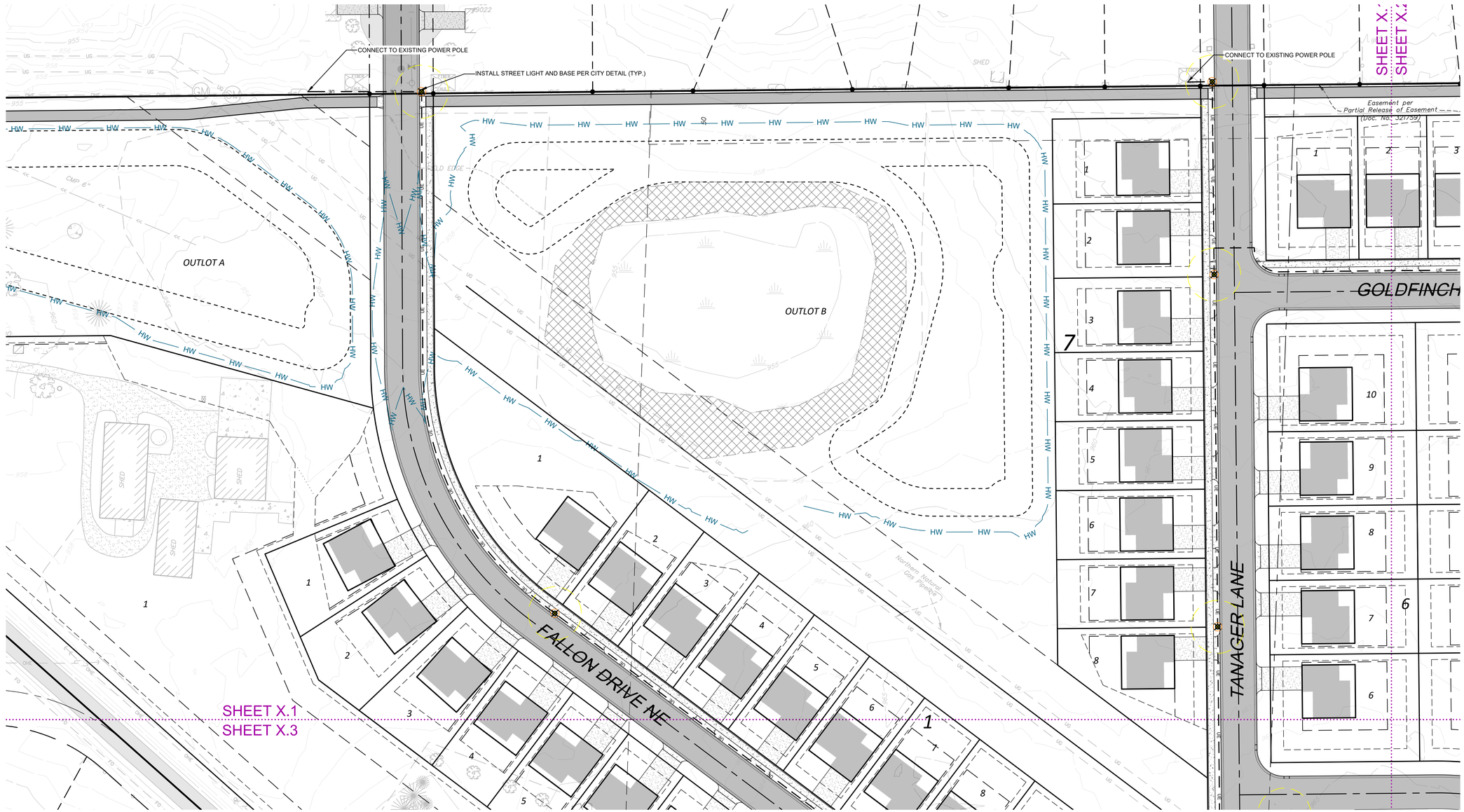
FUTURE STREET LIGHT

UE PROPOSED UNDERGROUND ELECTRIC CONDUIT/ LINE

N

0 50'

SCALE: 1" = 50'



CALL 48 HOURS BEFORE DIGGING:
GOPHER STATE ONE CALL
TWIN CITY AREA 651-454-0002
MINNESOTA TOLL FREE 1-800-252-1166

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CHECKED BY: CJD
DWG FILE: LIGHTING PLAN
FILE NO.: 21-0300.00

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MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

LIGHTING PLAN

SHEET NO.

C10.1

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STREET LIGHTING GENERAL NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH MONTICELLO MUNICIPAL UTILITIES (MMU) AND THE ELECTRIC COMPANY TO EXTEND POWER TO THE PROPOSED LIGHTING SERVICE PANEL.
2. THE CONTRACTOR SHALL VERIFY LOCATION OF LIGHTING SERVICE PANEL/CONCRETE PAD WITH MMU.
3. CONTRACTOR SHALL PROVIDE UNDERGROUND 1-$\frac{1}{2}$" PVC SCHEDULE 40 CONDUIT WITH COPPER WIRE TO ADEQUATELY SUPPLY POWER TO THE PROPOSED STREET LIGHTS.
4. SEE ELEC DETAILS FOR REQUIREMENTS ON STREET LIGHTS, LIGHT BASES, CONDUIT, WIRING, AND GROUNDING.
5. ALL LIGHTING BASES, POLES, AND WIRING TO BE INSTALLED BY MMU

LEGEND:

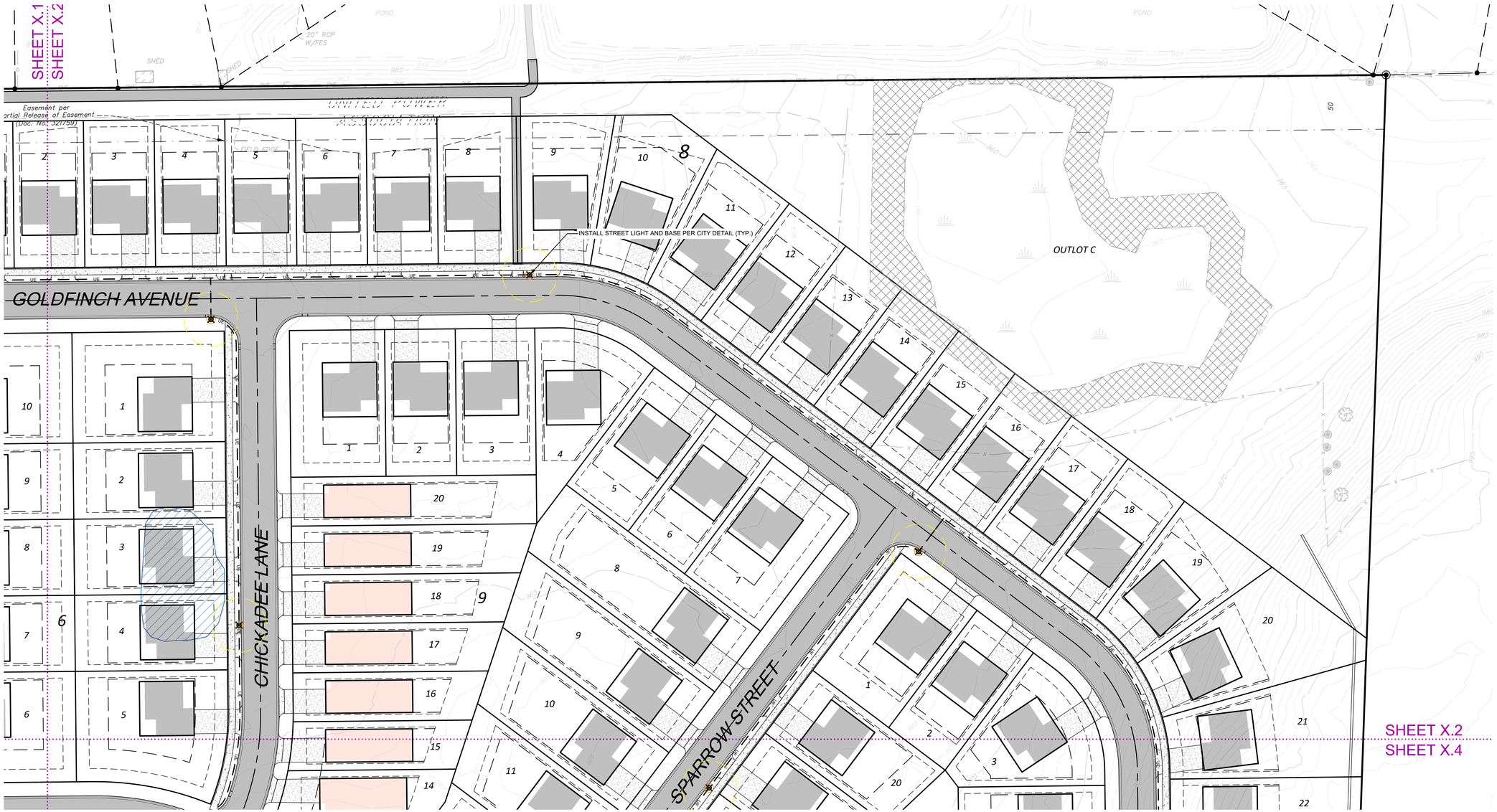
FUTURE STREET LIGHT

UE — PROPOSED UNDERGROUND ELECTRIC CONDUIT/ LINE

N

0 50'

SCALE: 1" = 50'



CALL 48 HOURS BEFORE DIGGING:
GOPHER STATE ONE CALL
TWIN CITY AREA 651-454-0002
MINNESOTA TOLL FREE 1-800-252-1166

REV NO.	DATE	DESCRIPTION
-	09/07/2022	DRAWINGS ISSUED TO CITY
1	09/19/2022	REVISED PER PUD REVIEW
2	07/26/2024	UPDATED WITH NEW LAYOUT
3	12/11/2024	REVISED PER CITY COMMENTS

DATE: 12/11/2024
DESIGN BY: MJM
DRAWN BY: MJM
CHECKED BY: CJD
DWG FILE: LIGHTING PLAN
FILE NO.: 21-0300.00

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.

Signed: _____ Lic. No. _____
Date: _____

BOGART, PEDERSON & ASSOCIATES, INC.
LAND SURVEYING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES
1307B FIRST STREET, BECKER, MN 55308-9322
TEL: 763-261-3822 FAX: 763-262-3844

MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

LIGHTING PLAN

SHEET NO.

C10.2

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STREET LIGHTING GENERAL NOTES

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LEGEND:

FUTURE STREET LIGHT

UE PROPOSED UNDERGROUND ELECTRIC CONDUIT/ LINE

N

0 50'

SCALE: 1" = 50'



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TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

LIGHTING PLAN

SHEET NO.

C10.3

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4. SEE ELEC DETAILS FOR REQUIREMENTS ON STREET LIGHTS, LIGHT BASES, CONDUIT, WIRING, AND GROUNDING.
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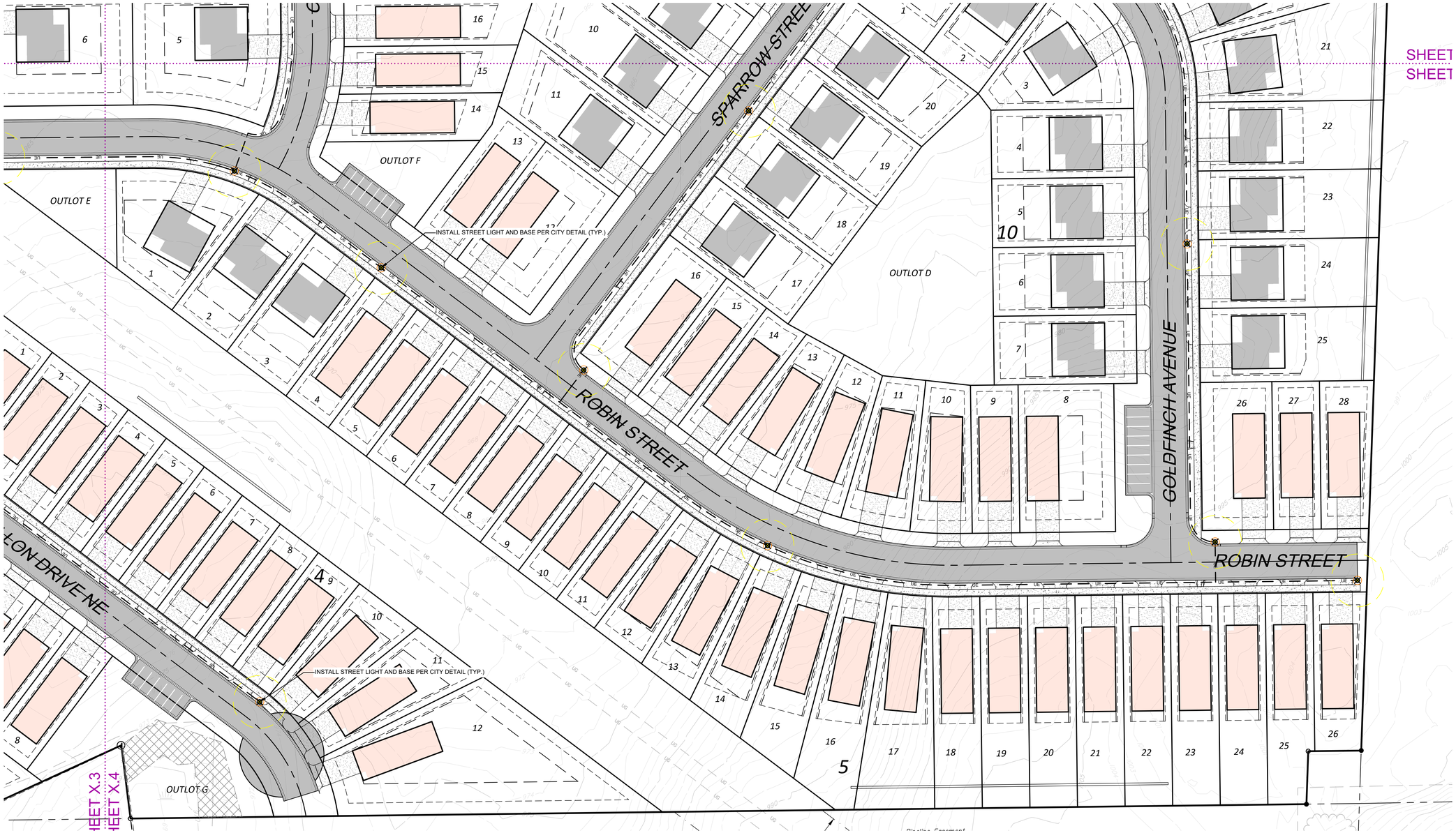
FUTURE STREET LIGHT

UE — PROPOSED UNDERGROUND ELECTRIC CONDUIT/ LINE

N

0 50'

SCALE: 1" = 50'



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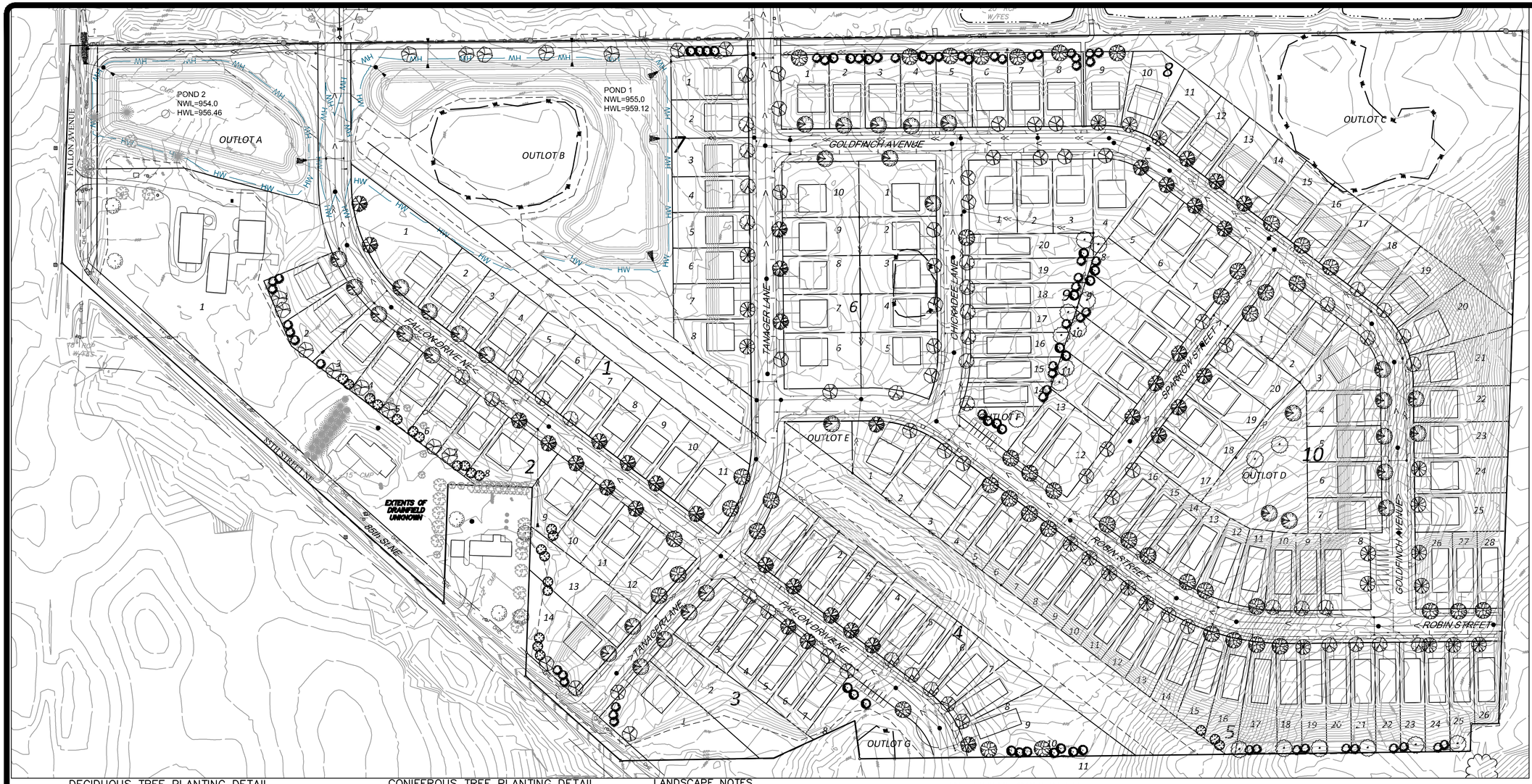
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13076 FIRST STREET | BECKER, MN 55308-9322
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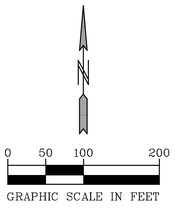
MEADOWS AT PIONEER PARK
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

LIGHTING PLAN

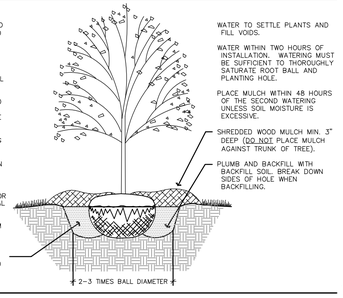
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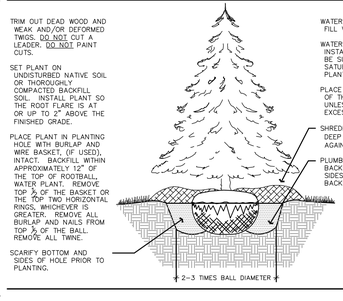




DECIDUOUS TREE PLANTING DETAIL



CONIFEROUS TREE PLANTING DETAIL



LANDSCAPE NOTES

- THE LANDSCAPE CONTRACTOR SHALL VISIT THE PROJECT SITE TO BECOME FAMILIAR WITH THE EXISTING CONDITIONS PRIOR TO SUBMITTING A BID.
- THE LANDSCAPE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT OF PROPOSED PHYSICAL START DATE AT LEAST 7 DAYS IN ADVANCE.
- THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FIELD VERIFICATION OF ALL EXISTING UTILITY LOCATIONS ON THE PROJECT SITE WITH GOPHER STATE ONE CALL 1-800-252-1166 PRIOR TO COMMENCING WORK. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND REPAIR OF EXISTING UTILITIES DAMAGED DURING CONSTRUCTION AT NO COST TO THE OWNER. NOTIFY THE LANDSCAPE ARCHITECT OF ANY CONFLICTS TO FACILITATE PLANT RELOCATION.
- GRADING TO BE PERFORMED BY OTHERS.
- NO PLANT MATERIAL SHALL BE INSTALLED UNTIL GRADING AND CONSTRUCTION HAS BEEN COMPLETED IN THE IMMEDIATE AREA.
- ALL PLANT MATERIAL SHALL MEET THE STANDARDS FOUND IN THE AMERICAN ASSOCIATION OF NURSERYMEN-AMERICAN STANDARD FOR NURSERY STOCK.
- ALL CONTAINER MATERIAL TO BE GROWN IN THE CONTAINER A MINIMUM OF SIX (6) MONTHS PRIOR TO PLANTING ON SITE.
- DECIDUOUS AND CONIFEROUS TREES SHALL NOT BE STAKED, BUT THE LANDSCAPE CONTRACTOR MUST GUARANTEE STANDABILITY TO A WIND SPEED OF 60 M.P.H.
- THE LANDSCAPE CONTRACTOR SHALL PROVIDE A MINIMUM GUARANTEE OF ONE YEAR ONE TIME REPLACEMENT ON NEW PLANT MATERIALS. GUARANTEE SHALL BE AGREED UPON BY DEVELOPER/BUILDER AND LANDSCAPE CONTRACTOR.
- THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REJECT ANY PLANTS WHICH ARE DEEMED UNSATISFACTORY BEFORE, DURING OR AFTER INSTALLATION.
- IF THERE IS A DESCREPANCY BETWEEN THE NUMBER OF PLANTS SHOWN ON THE PLAN AND THE NUMBER SHOWN ON THE PLANT LIST, THE NUMBER SHOWN ON THE PLAN WILL TAKE PRECEDENCE.
- THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MULCHES AND PLANTING SOIL QUANTITIES TO COMPLETE WORK SHOWN ON THE PLAN. THE LANDSCAPE CONTRACTOR SHALL VERIFY ALL QUANTITIES SHOWN ON THE PLANT SCHEDULE.
- COMMERCIAL GRADE POLY LAWN EDGING SHALL BE INSTALLED WHERE NOTED.
- THE LANDSCAPE CONTRACTOR SHALL REPAIR ALL DAMAGE TO THE SITE CAUSED BY THE PLANTING OPERATION AT NO COST TO THE OWNER.
- THE LANDSCAPE CONTRACTOR SHALL KEEP PAVEMENTS CLEAN UNSTAINED. ALL PEDESTRIAN AND VEHICLE ACCESS TO BE MAINTAINED THROUGHOUT CONSTRUCTION PERIOD. ALL WASTES SHALL BE PROMPTLY REMOVED FROM THE SITE. ANY DAMAGE TO EXISTING FACILITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE CODES, REGULATIONS AND PERMITS GOVERNING THE WORK.
- STORAGE OF MATERIALS OR SUPPLIES ON-SITE WILL NOT BE ALLOWED.

PLANTING SCHEDULE

KEY	COMMON NAME/SCIENTIFIC NAME	ROOT	QUANTITY
	OVERSTORY TREES		
	AUTUMN BLAZE MAPLE/ACER X FREEMANII	2" B&B	34
	HACKBERRY/CELTIS OCCIDENTALIS	2" B&B	21
	SENTRY LINDEN/TILIA AMERICANA 'SENTRY'	2" B&B	35
	RED OAK/QUERCUS RUBRA	2" B&B	36
	THORNLESS HONEYLOCUST/GLEDITSIA TRIACANTHOS VAR INEMIS	2" B&B	40
	RIVER BIRCH/BETULA NIGRA 'HERITAGE' (CLUMP)	10-12' B&B	18
	NORTHWOODS RED MAPLE/ACER RUBRUM	2" B&B	46
	SWAMP WHITE OAK/QUERCUS BICOLOR	2" B&B	14
	EVERGREEN TREES		
	WHITE PINE/PINUS STROBUS	6' B&B	27
	NORWAY SPRUCE/PICEA ABIES	6' B&B	23
	BLACK HILLS SPRUCE/PICEA GLUACA VAR DENSATA	6' B&B	54

CITY LANDSCAPE REQUIREMENTS:
4 CALIPER INCHES PER INTERIOR LOT
8 CALIPER INCHES PER CORNER LOT
156 TOTAL LOTS (138 INTERIOR, 18 CORNER)
696 CALIPER INCHES REQUIRED

TOTAL TREES REQUIRED: 348 2" TREES

PROPOSED TREES: 348
244 2" OVERSTORY
104 6' CONIFERS
PROPOSED INCHES: 696"

ENGINEERING DESIGN AND EXISTING TREE INVENTORY BY BOGART, PEDERSON & ASSOCIATES

00-PLAN-122082-SHEET-LAND

PIONEER engineering
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2422 Enterprise Drive
Mendota Heights, MN 55120
(651) 681-1914
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www.pioneereng.com

I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly Licensed Landscape Architect under the laws of the State of Minnesota
Name Jennifer L. Thompson
Reg. No. 44763 Date 4-29-2025

Revisions
4-29-2025 updated site plan

Date 8-25-2022
Designed JLT
Drawn JLT

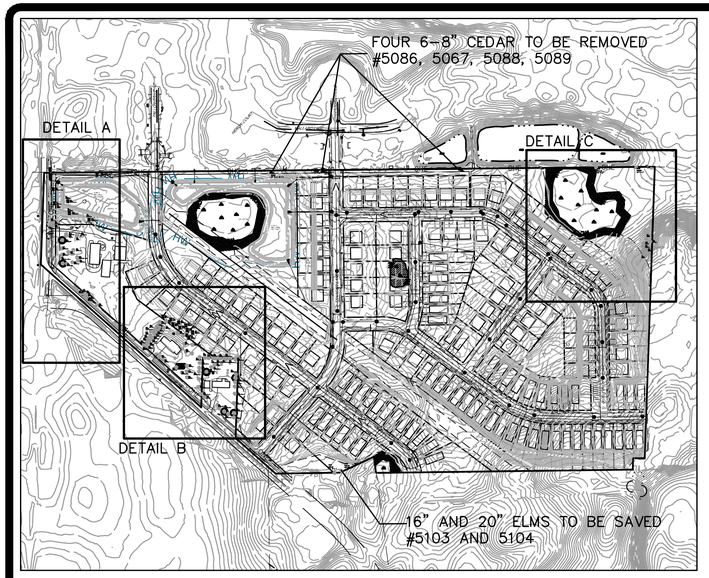
LANDSCAPE PLAN

TAMARACK LAND DEVELOPMENT, LLC

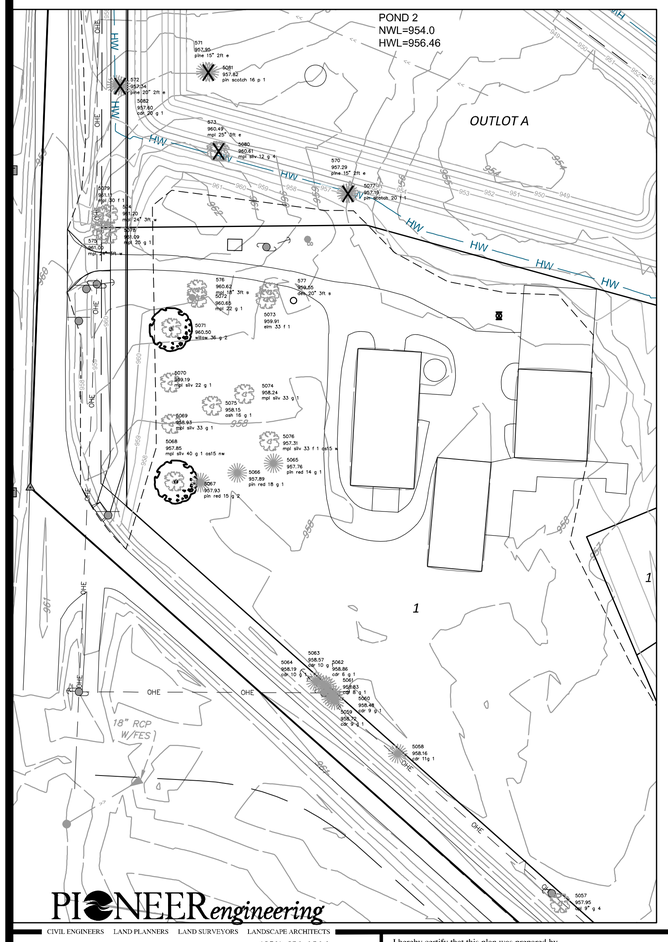
85TH STREET PROJECT
MONTICELLO, MINNESOTA

1 OF 1

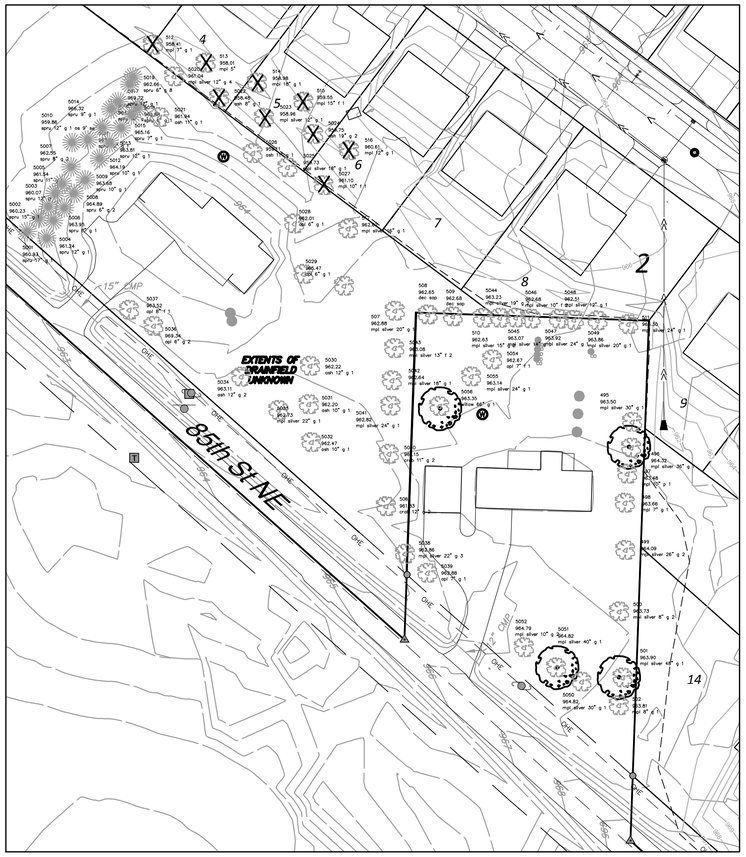
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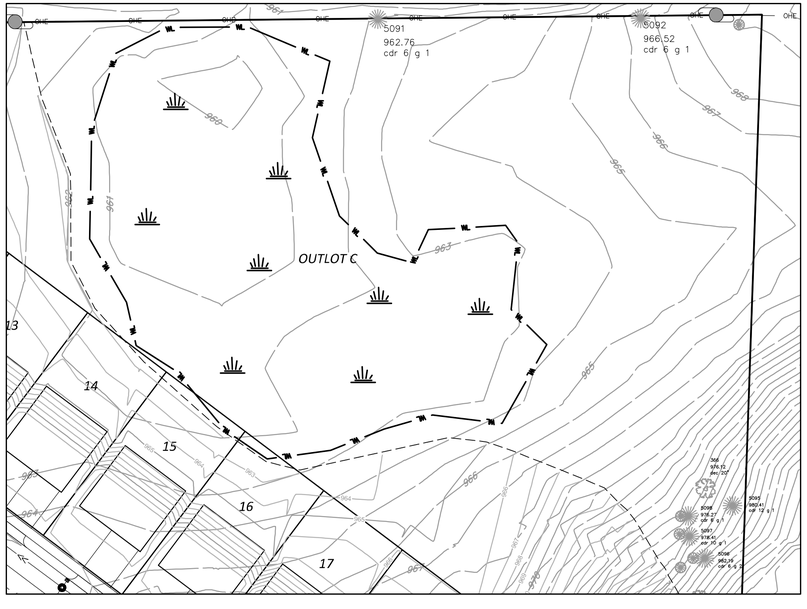
DETAIL A



DETAIL B



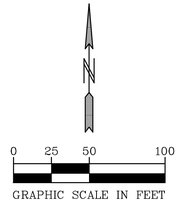
DETAIL C



NON-SPECIMEN TREE TO BE REMOVED

NON-SPECIMEN TREE TO BE SAVED

SPECIMEN TREE (NO SPECIMEN TREES WILL BE REMOVED)



Tree No.	Species	Dia. (Inches)	Condition	Stems		Status
496	Silver Maple	36	Good		Specimen	Save
502	Silver Maple	48	Good		Specimen	Save
5001	Spruce	17	Good	1		Save
5002	Spruce	15	Good	1		Save
5003	Spruce	12	Good	1		Save
5004	Spruce	12	Good	1		Save
5005	Spruce	11	Good	1		Save
5006	Spruce	8	Good	1		Save
5007	Spruce	8	Good	2		Save
5008	Spruce	6	Good	2		Save
5009	Spruce	10	Good	1		Save
5010	Spruce	12	Good	1		Save
5011	Spruce	10	Good	1		Save
5012	Spruce	10	Good	1		Save
5013	Spruce	12	Good	1		Save
5014	Spruce	9	Good	1		Save
5015	Spruce	7	Good	1		Save
5016	Spruce	10	Good	1		Save
5017	Spruce	12	Good	1		Save
5018	Spruce	6	Good	1		Save
5019	Spruce	6	Good	1		Save
5020	Maple Silver	12	Good	4		Save
5021	Ash	11	Good	1		Save
5022	Ash	8	Good	1		Remove
5023	Maple Silver	12	Good	1		Remove
5024	Ash	19	Good	2		Remove
5025	Maple Silver	18	Good	1		Remove
5026	Ash	11	Good	1		Save
5027	Maple	10	Fair	1		Remove
5028	Apple	6	Good	1		Save
5029	Apple	6	Good	1		Save
5030	Ash	12	Good	1		Save
5031	Ash	10	Good	1		Save
5032	Ash	10	Good	1		Save
5033	Maple Silver	22	Good	1		Save
5034	Ash	12	Good	2		Save
5035	Siberian Pea	18	Good	1		Save
5036	Apple	6	Good	2		Save
5037	Apple	8	Fair	1		Save
5038	Maple Silver	22	Good	3		Save
5039	Apple	7	Good	1		Save
5040	Crab	11	Good	2		Save
5041	Maple Silver	24	Good	1		Save
5042	Maple Silver	18	Good	1		Save
5043	Maple Silver	13	Fair	2		Save
5044	Maple Silver	19	Good	2		Save
5045	Maple Silver	14	Good	1		Save
5046	Maple Silver	10	Fair	2		Save
5047	Maple Silver	24	Good	1		Save
5048	Maple Silver	12	Good	1		Save
5049	Maple Silver	20	Good	1		Save
5050	Maple Silver	30	Good	1		Save
5051	Maple Silver	40	Good	1	Specimen	Save
5052	Maple Silver	10	Good	2		Save
5053	Siberian Pea	22	Good	1		Save
5054	Apple	7	Fair	1		Save
5055	Maple Silver	24	Good	1		Save
5056	Willow	66	Good	1	Specimen	Save
5057	Apple	9	Good	4		Save
5058	Cedar	11	Good	1		Save
5059	Cedar	9	Good	1		Save
5060	Cedar	9	Good	1		Save
5061	Cedar	8	Good	1		Save
5062	Cedar	6	Good	1		Save
5063	Cedar	10	Good	1		Save
5064	Cedar	10	Good	1		Save
5065	Pine	14	Good	1		Save
5066	Pine	18	Good	1		Save
5067	Pine	15	Good	2		Save
5068	Maple Silver	40	Good	1	Specimen	Save
5069	Maple Silver	33	Good	1		Save
5070	Maple Silver	22	Good	1		Save
5071	Willow	36	Good	2	Specimen	Save
5072	Maple	22	Good	1		Save
5073	Elm	33	Fair	1		Save
5074	Maple Silver	33	Good	1		Save
5075	Ash	16	Good	1		Save
5076	Maple Silver	33	Fair	1		Save
5077	Pine Scotch	20	Fair	1		Remove
5078	Maple	25	Good	1		Save
5079	Maple	30	Fair	1		Save
5080	Maple Silver	12	Good	4		Remove
5081	Pine Scotch	16	Poor	1		Remove
5082	Cedar	20	Good	1		Remove
5083	Elm Siberian	10	Good	3		Remove
5083	Elm	9	Good	2		Save
5084	Crab	8	Fair	4		Remove
5086	Cedar	8	Good	10		Remove
5087	Cedar	6	Good	1		Save
5088	Cedar	6	Good	1		Remove
5089	Cedar	6	Good	1		Remove
5090	Russian Olive	15	Good	2		Save
5091	Cedar	6	Good	1		Save
5092	Cedar	6	Good	1		Save
5093	Box Elder	12	Fair	3		Save
5094	Cedar	12	Good	1		Save
5095	Cedar	12	Good	2		Save
5096	Cedar	6	Good	1		Save
5097	Cedar	10	Good	1		Save
5098	Box Elder	6	Good	1		Save
5099	Box Elder	11	Good	2		Save
5100	Cherry Black	11	Good	1		Save
5101	Box Elder	6	good	Multi		Save
5102	Elm	20	Good	2		Save
5103	Elm	16	Good	1		Save

00-PLAN-122082-SHEET-TREE

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Name Jennifer L. Thompson
Reg. No. 44763 Date 4-29-2025

Revisions
4-29-2025 updated site plan

Date 8-25-2022
Designed JLT
Drawn JLT

TREE PRESERVATION PLAN

TAMARACK LAND DEVELOPMENT, LLC

85TH STREET PROJECT
MONTICELLO, MINNESOTA

T1 OF 1

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Tamarack Land – Monticello, LLC

P.U.D. Residential Development

Stormwater Treatment Facilities Operation and Maintenance Plan

Monticello, MN

November 2024

Bogart, Pederson & Associates, Inc.
CIVIL ENGINEERING
LAND SURVEYING
ENVIRONMENTAL SERVICES
Traditional Values • Creative Solutions

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.

Signed: *Michael Mordal-Huebsch*
Michael J. Mordal-Huebsch
Date: 11/26/2024 License Number: 61148

Table of Contents

I. Introduction....1
II. Designation of Responsible Individuals....1
III. Facilities to be Maintained....1
IV. Maintenance Activities....2

Figures

- Figure 1: Site-wide Stormwater BMPs

Attachments

- Utility Plan

I. Introduction

I.A. Site Description

The proposed site property is located along north of 85th St NE and south of Mallard Ln in Monticello, Mn (PID# 21-31-00-24-2201 & 21-31-00-24-2202). Around 67 acres of land is being developed. Tamarack, LLC desires to develop the land for 157 new single-family residential homes. Based on our preliminary review of the subject property, it has access from the north through an existing neighborhood.

The stormwater for the site will be managed with the addition of two new ponds on the site. The new ponds provide water quality treatment and provide storage volume to control discharge rates off site. Prior to water being discharged into the ponds, they will be pre-treated with a sump in the last manhole, and a forebay. An overflow control structure will

II. Designation of Responsible Individuals

The underground storage, pretreatment filters, storm sewer, sump catch basin, and Rain Guardian Turrets are located around the site as shown in **Figure 1** and Exhibit "A". These, along with other the stormwater BMPS on site, will all be maintained by the property manager. Maintenance shall be conducted by licensed professionals.

II.A. Designated Contacts for Operation and Maintenance

[Name, Title or Position]

[Address]

[Telephone]

[Email]

II.B. Off-Hours or Emergency Contact(s)

This is expected to be the contractor(s) selected by the owners of the individual lots.

III. Facilities to be Maintained

III.A. Facility Descriptions

- Wet Retention Pond
    - Storm sewer and overland flow directs storm water to two retention ponds to the Northwest of the site.
    - Forebays slow down the water and silt settles at the bottom of them, prior to entering the wet pond's storage area. Sediment, trash, or other debris will need to be cleaned out often.
    - The civil plans will include specific information for the Prinsco underground storage
    - Inspection Frequency: After rain events of half inch or more. Minimum: Every 3 months.

- Sump manholes and Overflow Control Structures
    - Storm manholes with sumps will collect sediment as a pretreatment method.
    - Sediment, trash, and other debris will need to be cleaned out and disposed of.
    - Inspection Frequency: After rain events of half inch or more. Minimum: Every 6 months.
- Drainage Swales
    - Swales direct water to storm catch basins or wet ponds.
    - Swales may erode with large rain fall or if vegetation is not established.
    - Provide additional seeding and erosion control (erosion control blanket, erosion mats, etc.) as needed to prevent erosion.
    - Inspection Frequency: After rain events of one inch or more: Minimum: Yearly.

III.B. Facility Construction Details

[To be added following construction]

[Attach As-Built Drawings to Final O&M Plan]

IV. Maintenance Activities

IV.A. General Maintenance Rules

At no time will synthetic pesticides or fertilizers be applied, nor will any soil amendments, other than aged compost mulch or sand/compost mix, be introduced. The top of soil surface will be maintained at or near the design elevation throughout. Irrigation systems will be maintained to conserve water while maintaining plant health.

Although it is unlikely to be needed, if plants are not thriving compost tea may be applied at a recommended rate of 5 gallons mixed with 15 gallons of water per acre, up to once per year between March and June. Compost tea will not be applied when temperatures are below 50°F or above 90°F or when rain is forecast within the next 48 hours.

The following may be applied for pest control if needed:

- Beneficial nematodes
- Safer® products
- Neem oil

IV.B. Maintenance Schedule

The stormwater treatment facilities will be maintained on the following schedule at a minimum.

IV.B.1. Routine Activities

The facilities will be examined daily for visible trash during regular policing of the site, and trash will be removed. Any graffiti, vandalism, or other damage will be noted and addressed within 48 hours.

The planted areas will be weeded by hand approximately monthly. At this time plants will be inspected for health and the irrigation system will be turned on manually and checked for any leaks or broken lines, misdirected spray patterns etc. Any dead plants will be replaced.

IV.B.2. Following Significant Rain Events

A significant rain event will be considered to be one that produces approximately a half-inch or more rainfall in a 24-hour period. Within 24 hours after each such event, the following will be conducted:

- Inlets will be inspected, and any accumulations of trash or debris will be removed.
- Storm sewer structures and sumps will be inspected, and any accumulations of trash or debris will be removed.
- The surface of the mulch layer will be inspected for movement of material. Mulch will be replaced and raked smooth if needed.
- Erosion control plan, storm water pollution prevention plan, and NPDES inspection requirements shall be followed.

IV.B.3. Prior to the Start of the Rainy Season

In September or each year, site inlets and outlets will be inspected to confirm there is no accumulation of debris that would block flow. If not previously addressed during continual maintenance, any growth and spread of plantings that blocks inlets or the movement of runoff across the surface of the facility will be cut back or removed.

IV.B.4. Annually During Winter

Once, in December – February of each year, vegetation will be cut back as needed, debris removed, and plants and mulch replaced as needed. Storm sewer manholes, inlets, and curb will be inspected for damage. The elevation of the top of soil and mulch layer will be confirmed to be consistent with the design elevation and with the design 6-inch reservoir depth.

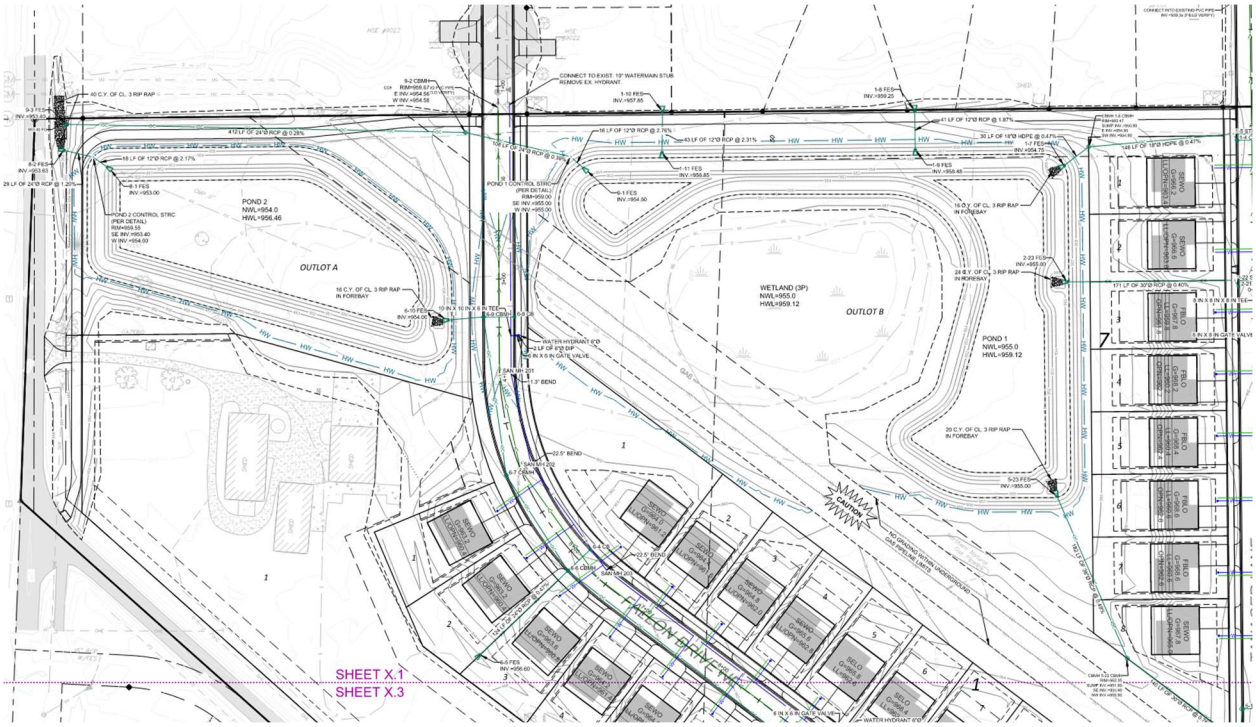


Figure 1: Sitewide Stormwater BMPs

EXHIBIT “A”

Utility Plan

LEGEND:

- PROPOSED STORM SEWER
- PROPOSED WATER LINE
- PROPOSED SANITARY SEWER
- PROPOSED WATER SERVICE
- PROPOSED SANITARY SERVICE
- PROPOSED SANITARY MANHOLE
- PROPOSED FLARED END SECITON
- PROPOSED STORM MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED GATE VALVE & BOX
- PROPOSED HYDRANT
- PROPOSED RIP RAP

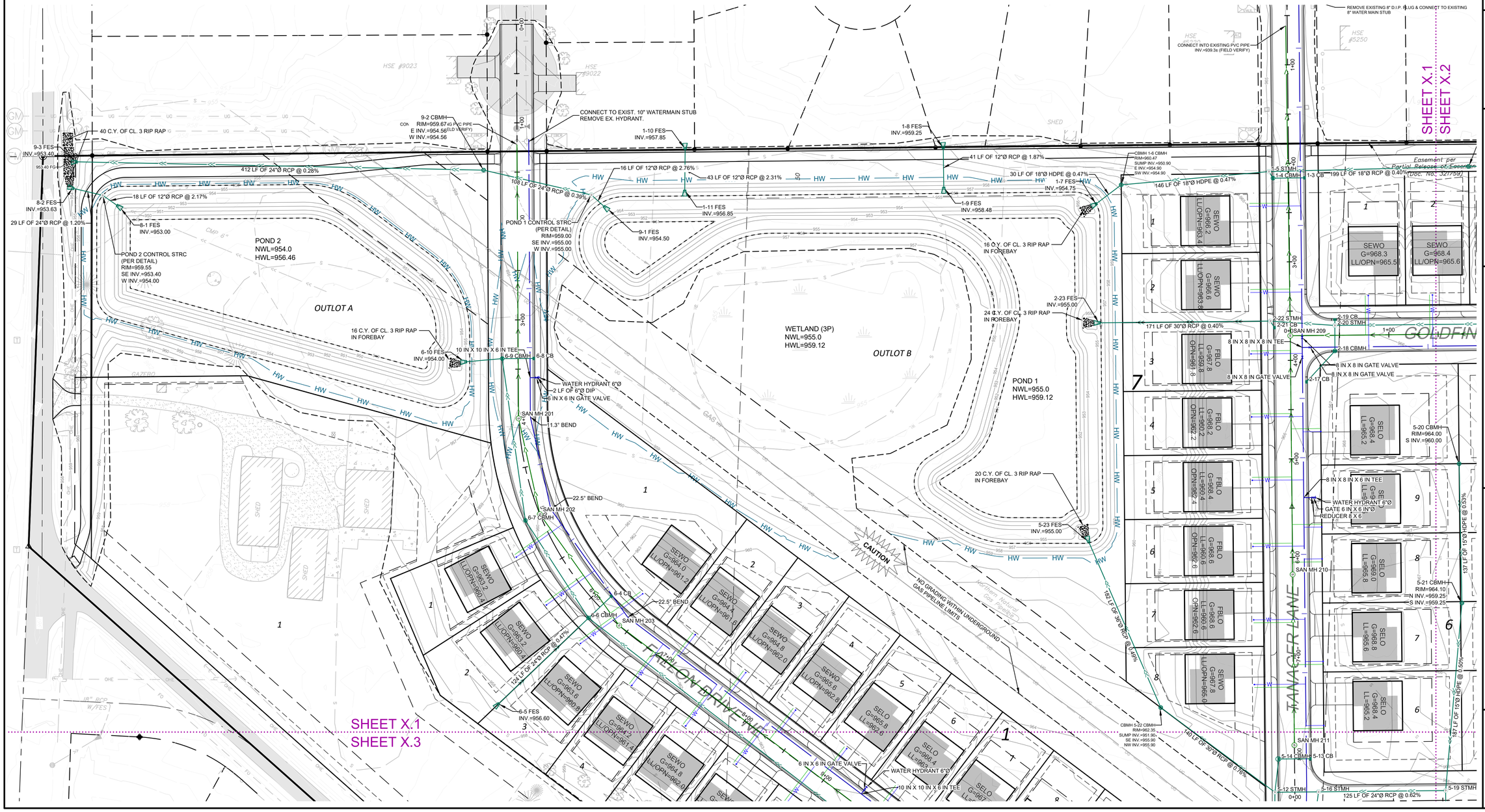
UTILITY GENERAL NOTES:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL UTILITY RELOCATIONS.
2. CONTRACTOR SHALL LOCATE AND VERIFY ALL UTILITIES WHICH MAY AFFECT THIS WORK AND NOTIFY OWNER OF ANY CHANGES. CONTACT LOCAL UTILITY COMPANIES FOR EXACT LOCATIONS PRIOR TO BIDDING THE PROJECT AND COMMENCING WORK.
3. CONTRACTOR SHALL VERIFY CRITICAL ELEVATIONS TO ENSURE CONFORMANCE WITH GRADING PLAN AND EXISTING UTILITIES, PARTICULARLY WITH EXISTING STRUCTURES AND/OR PAVEMENTS TO REMAIN.
4. THE CONTRACTOR SHALL NOTE ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS AS EXISTING IN THE FIELD AND AS REPRESENTED WITHIN THE PLANS AS SHOWN AND ALERT THE ENGINEER BEFORE BIDDING THE PROJECT AND BEGINNING CONSTRUCTION.
5. WATER LINE TO MINIMUM 8.0 FEET DEPTH.
6. VERIFY INVERT ELEVATIONS OF EXISTING SANITARY LINE AT POINT OF CONNECTION WITH NEW SANITARY LINE PRIOR TO INSTALLING ANY NEW UTILITIES.
7. ALL CROSSING ELEVATIONS OF NEW UTILITIES & SIZES OF THE EXISTING UTILITIES ARE BASED ON ASSUMED ELEVATIONS AND SIZES PROVIDED BY THE SURVEY.
8. ALL SANITARY SERVICE PIPE AND FITTINGS WILL BE SCHDULE 40.
9. ALL STORM SEWER SHALL BE PVC SCHEDULE 40 WHEN LESS THAN 8" IN DIAMETER. ALL RCP STORM SEWER SHALL BE CLASS V PIPE UNLESS OTHERWISE NOTED. ALL HDPE STORM SEWER SHALL BE DUAL WALL HIGH PERFORMANCE POLYPROPYLENE PIPE AND SHALL CONFORM TO AASHTO M330.
10. ALL WATER LINES 4" OR GREATER SHALL CONFORM TO AWWA C900, AWWA C150, OR GRADE PE-3408 OR GRADE PE4710 PIPE AND SHALL BE RATED FOR 200 PSI. ALL WATER LINES LESS THAT 4" SHALL CONFORM TO AWWA C901 SIDR 7 (HDPE WATER LINE) OR TYPE K COPPER PIPE.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING TWO CONSECUTIVE PASSING BACTERIOLOGICAL TESTS FROM THE PROPOSED WATER SERVICE.
12. THE APPLICANT SHALL BE RESPONSIBLE FOR REPLACING ANY CONCRETE PAVEMENT WHICH IS DAMAGED OR REMOVED AS A RESULT OF THE PROPOSED WATER, SANITARY, STORM SEWER SERVICE INSTALLATION.
13. SEE DETAILS FOR SPECIFIC MODELS USED FOR CURB STOPS, MANHOLES, VALVES, ETC.
14. IF DEWATERING IS REQUIRED FOR THIS PROJECT, THE PUMP DISCHARGE SHALL BE TREATED PRIOR TO BEING DISCHARGED OFF-SITE OR INTO A SURFACE WATER. THE DISCHARGE SHALL BE VISUALLY CHECKED TO ENSURE THAT IT IS VISIBLY CLEAN WATER. NO DEWATERING IS EXPECTED FOR THIS SITE DUE TO SANDY SOIL CONDITIONS.
15. CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL PLAN FOR PAVEMENT REMOVAL, UTILITY INSTALLATION, AND REPLACEMENT AS NEEDED.

N

0 50'

SCALE: 1" = 50'



REV NO.	DATE	DESCRIPTION
-	09/07/2022	DRAWINGS ISSUED TO CITY
1	09/19/2022	REVISED PER PUD REVIEW
2	07/26/2024	UPDATED WITH NEW LAYOUT
3	11/26/2024	REVISED PER CITY COMMENTS

DATE: 11/26/2024
DESIGN BY: MJM
DRAWN BY: MJM
CHECKED BY: CJD
DWG FILE: UTILITY
FILE NO.: 21-0300.00

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.

Signed: _____ Lic. No. _____

Date: _____

BOGART, PEDERSON & ASSOCIATES, INC.
LAND SURVEYING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES
1307B FIRST STREET, BECKER, MN 55308-9322
TEL: 763-261-3822 FAX: 763-262-5844

P.U.D. RESIDENTIAL DEVELOPMENT
TAMARACK LAND - MONTICELLO, LLC
City of Monticello, Wright County, MN

NW UTILITY PLAN

SHEET NO.

C4.1

11/26/2024 10:53 AM n:\projects current\21-0300.00 tamarack monticello wilson\Civil\Cad files\Utility Profiles.dwg

Response to 08/29/2024 Memorandum

TO:	Matt Leonard, City Engineer/Public Works Director
FROM:	Chris Dahn, Bogart, Pederson & Associates
DATE:	November 15, 2024
RE:	Tamarack Residential Subdivision – Concept Stage PUD Plan Review City of Monticello, MN WSB Project No. 026480-000

Thank You for reviewing the "Tamarack Residential Subdivision" Concept Stage PUD Plan. BPA has reviewed the comments and we offer the following response to comments and recommendations that have been made in the review. Comments on the plan have been tabulated and responded to below.

General:

1. City staff will provide additional comments under separate cover.

BPA Response: Comment Noted.

2. Trail outlots or easements shall be 30' in width.

BPA Response: Trail outlots or easements are now 30' in width.

3. Verify the project concept will work with the existing utility easements on the property. Show the locations of existing easements on future submittals.

BPA Response: The plan is designed to work with the existing utility easements. A 100' wide outlot is present for the main gas line.

4. If split lots with existing structures are annexed into the City, provide utility stubs to serve the split lots. Once the utility stubs are provided, connection shall be made with the timelines outlined in the City of Monticello Code Chapter 50: Water and Sewer Ordinance.

BPA Response: Utility stubs are proposed for the split lots going onto city lots.

5. The plat will require 12' perimeter and 6' side-yard drainage and utility easements.

BPA Response: These easements have now been modified slightly to accomplish this.

6. The Fallon Avenue right of way shall be 50' from centerline.

BPA Response: This right of way has been expanded and now includes a portion of the trail.

7. With future submittals provide soil borings and full geotechnical evaluation to verify soil conditions, groundwater elevations within the site, and the proposed pavement section meeting City design requirements.

BPA Response: This information is provided in the storm water report.

Site, Street, & Utility Plans:

8. With future submittals, provide a full civil plan set that includes an existing/removals plan, utility plan, more detailed site/paving plan, grading plan, erosion/sediment control, and standard details plan.

BPA Response: These individual plans are present in the civil set.

Bogart, Pederson & Assoc
13076 First Street
Becker, MN 55308
Phone: 763/262-8822
Fax:763-262-8844
Toll free: 888/210-8301
www.bogart-pederson.com

9. Streets and utilities shall be designed in accordance with the applicable City Subdivision Ordinances and the City's General Specifications and standard Details Plates for Street and Utility Construction.

BPA Response: Comment Noted. Standard city details are utilized.

10. The plan includes trails, sidewalks, and pedestrian facilities. See additional comments on pedestrian access and mobility requirements provided by City Staff under separate cover. A more detailed review will be provided with future submittals.

BPA Response: Comment Noted.

11. The Fire Marshall and/or building department will review required fire hydrant location(s) and emergency vehicle access/circulation. Fire truck circulation will need to accommodate the City's ladder truck. Provide a turning movement exhibit to show that a fire truck can access all building structures, cul-de-sacs, roundabout areas, and parking lots as applicable. Additional comments may be provided under separate cover.

BPA Response: A firetruck turning movement is now provided.

12. With future submittals, provide a utility plan showing the existing and proposed sanitary sewer, watermain and storm sewer serving the site. An overall utility plan was not provided with the plan submittal however, below are initial concept level comments:
    a. Watermain looping may be required through the site to provide adequate fire flow supply.

    BPA Response: The watermain layout is provided in the utility plan. Looping will be able to be accomplished during future development at the ends of roads.

    b. Additional utility stubs to adjacent properties may also be required to accommodate future looping connections.

    BPA Response: Comment Noted.

    c. See initial comments on concept plan markups.

    BPA Response: BPA has not received these specific markups.

Stormwater Management

13. Below are General Stormwater Requirements for the Site:
    d. The applicant will be required to submit a stormwater management plan for the proposed development in accordance with the requirements in the City's Design Manual.

    BPA Response: Comment Noted. See attached storm water plan.

    e. Infiltration is required for new developments. If infiltration is not feasible provide documentation on the rational before moving to additional BMP's.

    BPA Response: Comment Noted.

    f. The new site will need to provide onsite volume control for runoff of 1.1" over the new impervious area, Pre-treatment measures are required prior to discharging to the volume control BMPs.

    BPA Response: Comment Noted.

    g. Water quality requirements will be considered met if volume control is achieved for the site. If volume control cannot be met then the development will need to show a no net increase of TSS and TP.

    BPA Response: Comment Noted. The wet ponds are designed to be of a design level 3 for TSS and TP reduction (TSS=90%, TP=60%)

    h. Rate control will be required for the new development. All rates must be equal or less than existing rates for each discharge location.

    BPA Response: Comment Noted.

i. An operation and maintenance plan for all stormwater BMPs is required and should be submitted with the stormwater report for review.

BPA Response: An operation and maintenance plan is now provided.

j. The site is not within the DWSMA and is subject to requirements of the City's Wellhead Protection Plan.

BPA Response: Comment noted.

14. Two feet of freeboard is required for the HWL of a basin to the low opening of a structure. Two feet of vertical separation is also required from an area's EOF elevation to the low opening.

BPA Response: Comment Noted.

15. Include storm sewer sizing calculations with future plans. Refer to the City design guidelines for Storm sewer requirements.

k. All flared end sections 12 inches in diameter and greater shall include trash guards per City detail.

BPA Response: This is included in the details.

l. The minimum full flow velocity within the storm sewer should be three fps. The maximum velocity shall be 10 fps, except when entering a pond, where the maximum velocity shall be limited to six fps.

BPA Response: These velocities are achieved in the storm water report.

m. Vaned grate (3067V) catch basin castings shall be used on all streets.

BPA Response: These details are called out in the provided details.

n. The maximum design flow at a catch basin for the 10-year storm event shall be three cubic feet per second (cfs), unless high capacity grates are provided. Catch basins at low points will be evaluated for higher flow with the approval of the City Engineer.

BPA Response: Grate inflow calculations are included. Any grate inflows over 3 cfs

16. The last structure prior to discharge to a stormwater BMP is required to be a 4' minimum sump structure.

BPA Response: These are provided prior to entering the wet ponds.

17. The proposed project will disturb more than one acre. Develop and include a SWPPP consistent with the MPCA CSWGP with future plan submittals. Provide calculations showing disturbed area, proposed impervious, and future impervious for the site.

BPA Response: Comment Noted. A SWPPP is provided.

18. An NPDES/SDS Construction Storm Water General Permit (CSWGP) shall be provided with the grading permit or with the building permit application for review, prior to construction commencing.

BPA Response: Comment Noted.

19. A detailed review of erosion and sediment control BMP's will take place with future submittals. Provide redundant perimeter control around all wetlands onsite.

BPA Response: Comment Noted.

Traffic & Access

20. The applicant is proposing three driveway access points, one extending form the existing Fallon Drive, one creating a south leg at the Mallard Lane and Tanager Circle intersection, and one located along 85th Street, approximately 1,200 feet east of Fallon Avenue. Street access spacing, grades, and sight lines will be review with future submittals.

BPA Response: Comment Noted

21. The site would generate approximately 1,481 daily trips, 11 AM peak hour trips and 148 PM peak hour trips. With this development and the Haven ridge development connecting to the south, the proposed traffic is expected to have impact along Fallon Avenue, 85th Street, Starling Drive, and School Boulevard.

BPA Response: Comment Noted.

22. Provide a traffic study for this development including impacted intersections, turn lane recommendations, and traffic control mitigation measures if needed. In addition, the location of the driveways adjacent to 85th St NE should be reviewed to make sure they are not impacted by the traffic turning on to 85th St NE.

BPA Response: A traffic study is being completed and should be completed by the end of January.

23. A sight line analysis should be completed at the Site Access Street and 85th St NE.

BPA Response: A sight line is now shown on the sign plan.

Wetlands & Environmental

24. Provide a wetland delineation for approval by the Local Government Unit. Wetland boundaries should be included on future plans. The City requires buffers around existing wetlands and the buffer widths are based on the wetland function.

BPA Response: Wetland delineation is shown on the plans and included in the survey.

25. Any permanent or temporary wetland impacts from new development must be permitted under the Wetland Conservation Act through a replacement plan.

BPA Response: Comment Noted.

If you have any questions I can be reached at (763) 262-8822. Thank you for providing review comments for this project.

Sincerely,
Bogart, Pederson & Associates, Inc.



Christopher J. Dahn, P.E.

Bogart, Pederson & Assoc
13076 First Street
Becker, MN 55308
Phone: 763/262-8822
Fax:763-262-8844
Toll free: 888/210-8301
www.bogart-pederson.com

Response to City of Monticello staff comments regarding the preliminary plat submittal for Meadows at Pioneer Park.

- Narrative
  - ✓ *Included in the resubmittal*
- Signed land-used application property owner to reflect both property owners' names
  - ✓ *Included in the resubmittal*
- Corrected PID on the land-use application
  - ✓ *Has been corrected on the land use application*
- Colored building elevation or clearly proposed minimum residential building and performance standards and address how they differ from the code requirements. If you have sample illustrations, note them as sample only and subject to approved PUD building standards.
  - ✓ *Included in the resubmittal*
- Title commitment
  - ✓ *Included in the resubmittal*
- Landscape Plan
  - ✓ *Included in the resubmittal*
- Driveway dimensions
  - ✓ *Included in the resubmittal*
- Proposed parks, common area and preservation easements
  - ✓ *Typical lot easements are labeled on the Preliminary Plat, the gas easement is labeled on the site plan and preliminary plat.*
- Written statement describing the applicants understanding of the financial requirements for the PUD.
  - ✓ *Included in the resubmittal*

STORMWATER

MANAGEMENT REPORT

City of Monticello

Wright County, MN

July, 2024

Tamarack Land-Monticello LLC. Residential Development PUD

Prepared for: Tamarack Land Company, LLC

Prepared by:

Bogart, Pederson & Associates, Inc.
CIVIL ENGINEERING
LAND SURVEYING
ENVIRONMENTAL SERVICES
Traditional Values • Creative Solutions

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.

Signed: _____

Daniel F. Bogart

Date: 07/17/2022 License Number: 55539

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Drainage Report Narrative

Drainage Maps
Drainage Map 1- Existing Conditions Drainage Areas
Drainage Map 2- Existing Land Use and Hydrologic Soil Group
Drainage Map 3- Proposed Conditions Drainage Areas
Drainage Map 4- Proposed Land Use and Hydrologic Soil Group

Appendix A - Drainage Calculations- Existing Conditions
- Existing Drainage Report

Appendix B - Drainage Calculations- Proposed Conditions
- Proposed Drainage Report

Appendix C - Proposed Design Calculations Summary
- Proposed Pond Design & Runoff Rates

Appendix D - Additional Design Information
- SSURGO Soils Data Report

1. SITE LOCATION AND EXISTING CONDITIONS:

Site Information:
The proposed Nelson Residential Development Project will be located on the southern edge of the city of Monticello, Minnesota.

Existing Site Conditions:
The subject property is located along north of 85th St NE and south of Mallard Ln in Monticello, Mn (PID# 21-31-00-24-2201 & 21-31-00-24-2202). The property is approximately 67.50+/- acres in size and is currently undeveloped. The balance of the property is unimproved and is being used as an agriculture field, the remaining area has wetlands. The wetlands are in locations determined with the wetland delineation.

The slope of the property generally falls east to west and in elevation to the low areas throughout the site (wetlands). Flows from hese low areas make their way to the regional wetland across Fallon Ave by draining under the road by way of an existing storm water pond. This site has gradual slopes overall with approximately a 48' fall from the high point to the lowlands.

Onsite Soils: A soil boring log of onsite soils is attached. A soils report and additional information is available from the USDA- Web Soil Survey Website. In general, the site is comprised of lean clays (CL) and Clayey Sands (SC).

2. PROPOSED SITE IMPROVEMENTS

The proposed project will include mass grading with two stormwater ponds being built. Due to native soils have low infiltrability, the proposed ponds cannot be infiltration ponds.

Tamarack, LLC desires to develop the land for 157 new single-family residential homes. Based on our preliminary review of the subject property, it has access from the north through an existing neighborhood. The existing roads in this neighborhood, Fallon Dr. and Tanager Ln will be continued into the new Nelson neighborhood. There is also access from the south by way of 85th St. No additional water runoff will be directed off site to the north, east or south. The water directed off site to the northwest will be reduced before leaving the site.

The Total New Impervious for the project is: 814,316 SF TOTAL.

3. STORMWATER MANAGEMENT

The stormwater for the site will be managed with the addition of two new ponds on the site. The new ponds provide water quality treatment and provide storage volume to

control discharge rates off site. The ponds have been sized to meet MPCA and NPDES regulations. The existing stormwater conditions can be found in Appendix A. The proposed stormwater conditions can be found in Appendix B. The design with detail of each pond with can be found in Appendix C. Release rates off site for pre-construction and post-construction are in Appendix C.

The stormwater will be collected starting on the south side of the development and will be routed through a series of stormwater ponds as it is directed north to the regional wetland. The stormwater ponds are designed as wet ponds due to MPCA requirements and on site soil. The onsite soils are shown in the USDA web soil survey as having C & D soils groups. These soils are not optimal for infiltration therefore wet ponds were designed for the site. These ponds provide adequate storage area to treat the stormwater from this site and reduce the amount of water that is released compared to predevelopment. See the storm water calculations for addition details.

A summary of the off-site flow rates and water quality provided by the proposed stormwater ponds are summarized below:

Existing Drainage:

Northwest - Offsite		
Rainfall Event	*Flow (cfs)*	Peak Elevation
2 Year	6.23	NA
10 Year	37.21	NA
100 Year	90.61	NA
10-Day Snowmelt	NA	NA

Offsite Existing Detention Pond		
Rainfall Event	*Flow (cfs)*	Peak Elevation
2 Year	3.50	959.99
10 Year	4.52	961.87
100 Year	5.34	963.80
10-Day Snowmelt	NA	961.89

Southeast - Offsite		
Rainfall Event	*Flow (cfs)*	Peak Elevation
2 Year	4.44	NA
10 Year	8.44	NA
100 Year	16.51	NA
10-Day Snowmelt	NA	NA

Proposed Drainage:

Northwest - Offsite		
Rainfall Event	*Flow (cfs)*	Peak Elevation
2 Year	5.28	NA
10 Year	10.50	NA
100 Year	45.29	NA
10-Day Snowmelt	NA	NA

Offsite Existing Detention Pond		
Rainfall Event	*Flow (cfs)*	Peak Elevation
2 Year	3.17	959.36
10 Year	3.98	960.78
100 Year	5.01	962.97
10-Day Snowmelt	NA	959.76

Southeast - Offsite		
Rainfall Event	*Flow (cfs)*	Peak Elevation
2 Year	3.78	NA
10 Year	7.48	NA
100 Year	15.09	NA
10-Day Snowmelt	NA	NA

Existing vs. Proposed Runoff Rates:

Northwest - Offsite		
Rainfall Event	*Flow (cfs)*	Peak Elevation
2 Year	0.95	NA
10 Year	26.71	NA
100 Year	45.32	NA
10-Day Snowmelt	NA	NA

Offsite Existing Detention Pond		
Rainfall Event	*Flow (cfs)*	Peak Elevation
2 Year	0.33	0.63
10 Year	0.54	1.09
100 Year	0.33	0.83
10-Day Snowmelt	NA	2.13

Southeast - Offsite		
Rainfall Event	*Flow (cfs)*	Peak Elevation
2 Year	0.66	NA
10 Year	0.96	NA
100 Year	1.42	NA
10-Day Snowmelt	NA	NA

4. MIDS CALCULATOR CONSIDERATIONS

Wet Sedimentation Ponds

- **Design Level 1** (TSS = 60%, DP = 0%, PP =62%, TP = 34%):.

  ✓ Dead (or permanent) storage of at least 1800 cubic feet per acre that drains to the pond

  - **Permanent Pool Volume Required=1800 cf/Ac X 68.35 Ac = 123,023 cf.**
  - **Permanent Pool Volume Provided= 56,886 cf. (Between Elev. 951 – 955, and 949 – 954 for Ponds 1 and 2, respectively).**

  ✓ The pond's permanent storage volume must reach a minimum depth of at least 3 feet and must have no depth greater than 10 feet. The basin must be configured such that scour or resuspension of solids is minimized.

  - **Pond 1: Permanent Pool is between 951 and 955 contours**
  - **Pond 2: Permanent Pool is between 949 and 954 contours**

- **Design Level 2** (TSS = 84%, DP = 8%, PP = 84%, TP = 50%):

  ✓ Water quality volume (flood pool volume) >= 1 inch of impervious area

  - **Pond 1: Water Quality Volume Required= 1in X 15.58 Ac = 56,566 cf.**
    - **Water Quality Volume Provided= 104,500 cf. (Between Elev. 955 & 956.5).**
  - **Pond 2: Water Quality Volume Required= 1in X 3.11Ac = 11,293cf.**
    - **Water Quality Volume Provided= 146,754 cf. (Between Elev. 949 & 954).**

  ✓ Discharge rate of water quality volume does not exceed 5.66 cubic feet per second per acre of surface area of the pond.

  - **Pond 1: Required Water Quality Release Rate**
    - **5.66 cfs/acre of pond surface area X (78,539/43,560)= 10.20 cfs**
      - **Provided Water Quality Release Rate:**
        <2.73 cfs (per Water Control Structure release rate)

  - **Pond 2: Required Water Quality Release Rate**
    - **5.66 cfs/acre of pond surface area X (53,361/43,560)= 6.93 cfs**
      - **Provided Water Quality Release Rate:**
        <3.78 cfs (per Water Control Structure release rate)

  ✓ Flow path length to pond width ratio; 1:1 to 3:1

  - **Refer to design level 3 for additional applicable design criteria.**

- **Design Level 3** (TSS 90%, DP = 23%, PP = 90%, TP = 60%):

  ✓ Water quality volume (flood pool volume) >= 1.5 inch of impervious area

  - **Pond 1: Water Quality Volume Required= 1.5in X 15.58 Ac = 84,833 cf.**
    - **Water Quality Volume Provided= 104,500 cf. (Between Elev. 955 & 956.5).**
  - **Pond 2: Water Quality Volume Required= 1.5in X 3.11Ac = 16,939cf.**

- **Water Quality Volume Provided= 146,754 cf. (Between Elev. 949 & 954).**

✓ Wet extended detention or multi-cell system.

- **The two ponds are in series and designed to hold 3.5" of runoff over new impervious area, upstream of the ponds. The entire storage volume will be treated before it is discharged out of the ponds. Any runoff that leaves the ponds over the weirs will be treated before it is discharged.**

✓ Sediment forebay at all major inflows

- **The forebays of this pond are the permanent sediment traps that are in all catch basins, the ponding areas before end sections and the depressed area in the riprap.**

✓ Flow path length to pond width ratio; $3:1 \leq X \leq 10:1$

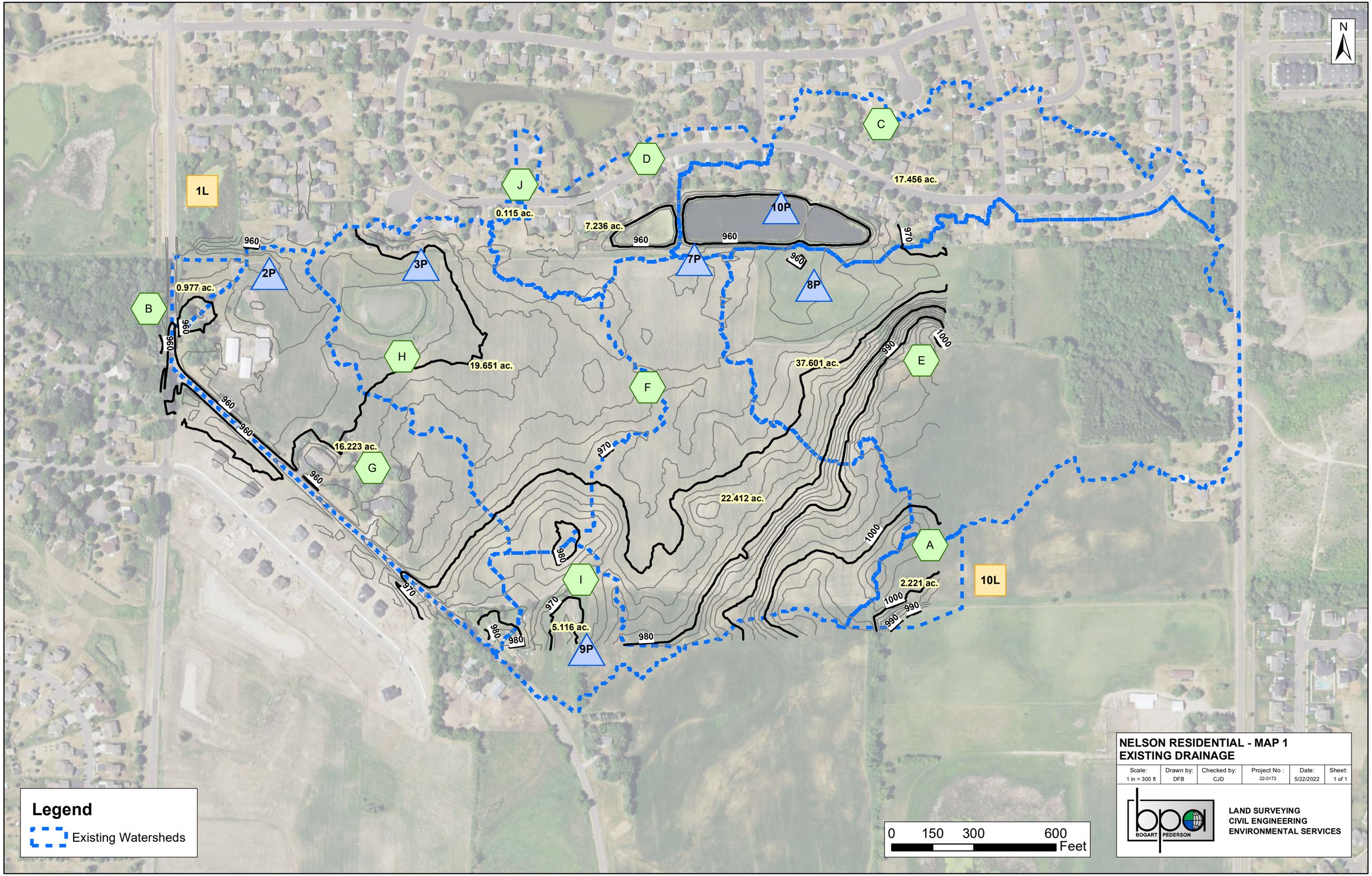
- **The flow path length through the pond 1 is 770'. The pond area is 63,736 sq. ft. The equivalent width is therefore 82.8 feet. Thus the ratio of flow path length to pond width is 9.3**
- **The flow path length through the pond 2 is 405'. The pond area is 53,380 sq. ft. The equivalent width is therefore 133.5 feet. Thus the ratio of flow path length to pond width is 3.0**

Conclusion: The Proposed Ponds Meets all the criteria to be considered a Design Level 3 Pond in the MIDS calculator.

4. REFERENCES:

Design data and methods are based on the following software and references:

1) HydroCad
2) USDA Web Soil Survey, https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm
3) Dept of Natural Respurces NOAA 14 Precipitation Frequency Estimates http://www.dnr.state.mn.us/climate/noaa_atlas_14.html
4) "Hydrologic Modeling of Small Watersheds", American Society of Agricultural Engineers
5) "Handbook of Hydraulics", Sixth Edition, Brater & King
6) "Design and Construction of Urban Stormwater Management Systems", ASCE Manual of Engineering Practice No 27, American Society of Civil Engineers
7) "Hydrologic Analysis and Design". Richard McCuen, Prentice Hall, 1989
8) "Minnesota Storm Water Manual", Current Edition, Minnesota Pollution Control Agency, https://stormwater.pca.state.mn.us/index.php/Main_Page


N
1L
J
D
C
0.115 ac.
7.236 ac.
17.456 ac.
10P
960
960
960
970
7P
8P
2P
3P
0.977 ac.
B
960
960
H
19.651 ac.
F
37.601 ac.
990
1000
E
960
960
16.223 ac.
G
970
22.412 ac.
1000
A
980
I
970
2.221 ac.
10L
1000
990
990
980
980
5.116 ac.
9P
980
Legend
Existing Watersheds
0 150 300 600
Feet
NELSON RESIDENTIAL - MAP 1
EXISTING DRAINAGE
Scale: 1 in = 300 ft
Drawn by: DFB
Checked by: CJD
Project No : 22-0172
Date: 5/22/2022
Sheet: 1 of 1
BOGART PEDERSON
LAND SURVEYING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES

N

1L

10L

A

B

C

D

E

F

G

H

I

J

2P

3P

7P

8P

9P

10P

Legend

Existing Watersheds

Hydrologic Soil Group

- B
- C
- C/D

LandUse

- 1 acre lots; 20% imp
- 1/4 acre lots; 38% imp
- 2 acre lots; 12% imp
- >75% Grass cover; Good
- Impervious Surface
- Pasture/grassland/range; Fair
- Row crops; SR + CR; Good
- Water Surface
- Woods; Fair

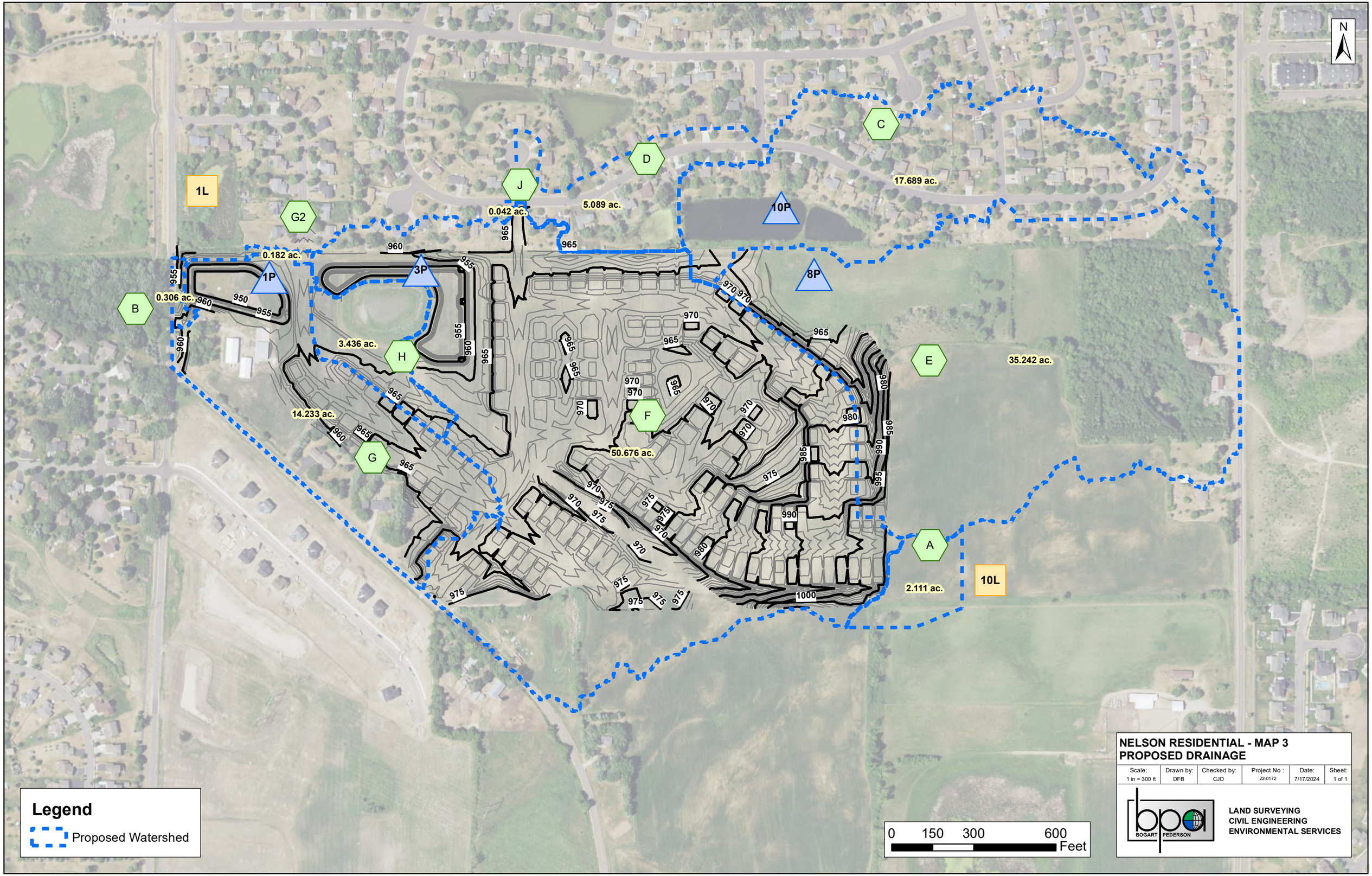
0 150 300 600 Feet

NELSON RESIDENTIAL - MAP 2
EXISTING LAND USE & SOIL TYPE

Scale:	Drawn by:	Checked by:	Project No :	Date:	Sheet:
1 in = 300 ft	DFB	CJD	22-0172	5/23/2022	1 of 1

BOGART PEDERSON

LAND SURVEYING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES



NELSON RESIDENTIAL - MAP 3
PROPOSED DRAINAGE

Scale:	Drawn by:	Checked by:	Project No :	Date:	Sheet:
1 in = 300 ft	DFB	CJD	22-0172	7/17/2024	1 of 1

BOGART PEDERSON

LAND SURVEYING
CIVIL ENGINEERING
ENVIRONMENTAL SERVICES

N

1L

G2

1P

3P

B

H

G

J

D

C

10P

8P

F

E

A

10L

Legend

Proposed Watershed

Hydrologic Soil Group

- B
- C
- C/D

LandUse

- 1 acre lots; 20% imp
- 1/4 acre lots; 38% imp
- 2 acre lots; 12% imp
- >75% Grass cover; Good
- Impervious Surface
- Pasture/grassland/range; Fair
- Row crops; SR + CR; Good
- Water Surface
- Woods; Fair

0 150 300 600 Feet

NELSON RESIDENTIAL - MAP 3
PROPOSED LAND USE & SOIL TYPES

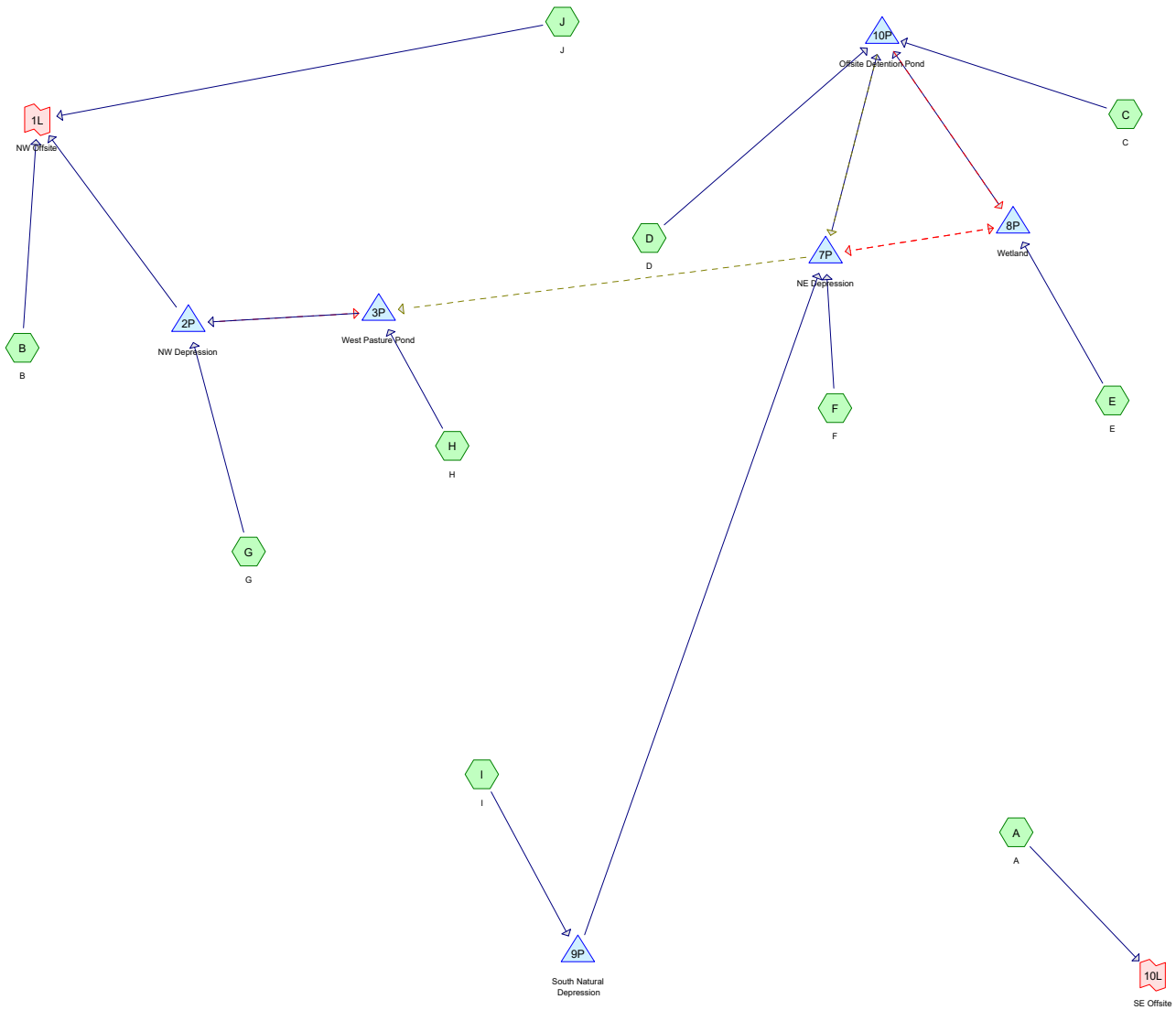
Scale:	Drawn by:	Checked by:	Project No :	Date:	Sheet:
1 in = 300 ft	DFB	CJD	22-0172	7/17/2024	1 of 1

BOGART PEDERSON

LAND SURVEYING
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ENVIRONMENTAL SERVICES

Appendix A

Drainage Calculations- Existing Conditions



Subcat Reach Pond Link

Routing Diagram for Pre 5.9.22

Prepared by {enter your company name here}, Printed 5/23/2022

HydroCAD® 10.10-7a s/n 03616 © 2021 HydroCAD Software Solutions LLC

Project Notes

Rainfall events imported from "NRCS-Rain.txt" for 5386 MN Wright

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 yr	MSE 24-hr	3	Default	24.00	1	2.84	2
2	10 yr	MSE 24-hr	3	Default	24.00	1	4.22	2
3	10-day snowmelt	Constant Intensity		Scale	120.00	1	7.20	4
4	100 yr	MSE 24-hr	3	Default	24.00	1	6.87	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.117	79	1 acre lots, 20% imp, HSG C, HSG C (E, G)
0.144	84	1 acre lots, 20% imp, HSG D, HSG D (G)
0.064	75	1/4 acre lots, 38% imp, HSG B, HSG B (C)
21.194	83	1/4 acre lots, 38% imp, HSG C, HSG C (C, D, E, G, H, J)
1.777	87	1/4 acre lots, 38% imp, HSG D, HSG D (C, D, E, H)
1.451	77	2 acre lots, 12% imp, HSG C, HSG C (B, G)
0.637	82	2 acre lots, 12% imp, HSG D, HSG D (G)
7.737	79	Pasture/grassland/range, Fair, HSG C, HSG C (C, D, E, G, H, I)
6.204	84	Pasture/grassland/range, Fair, HSG D, HSG D (C, D, E, G, H, I)
0.528	98	Paved roads w/curbs & sewers, HSG C, HSG C (B, G, I)
0.021	98	Paved roads w/curbs & sewers, HSG D, HSG D (B)
61.359	82	Row crops, SR + CR, Good, HSG C, HSG C (A, B, C, D, E, F, G, H, I)
10.227	85	Row crops, SR + CR, Good, HSG D, HSG D (B, C, D, E, F, G, H, I)
1.286	98	Water Surface, HSG C, HSG C (C, H)
0.380	98	Water Surface, HSG D (D)
2.778	98	Water Surface, HSG D, HSG D (C, E, H)
4.469	60	Woods, Fair, HSG B, HSG B (C, E)
5.641	73	Woods, Fair, HSG C, HSG C (E)

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	C	0.00	0.00	611.0	0.0219	0.011	0.0	12.0	0.0
2	2P	953.98	953.56	233.0	0.0018	0.025	0.0	6.0	0.0
3	10P	957.86	956.07	348.0	0.0051	0.011	0.0	12.0	0.0

Summary for Subcatchment A: A

Runoff = 4.44 cfs @ 12.17 hrs, Volume= 0.232 af, Depth= 1.25"
Routed to Link 10L : SE Offsite

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 2 yr Rainfall=2.84"

	Area (ac)	CN	Description
*	2.221	82	Row crops, SR + CR, Good, HSG C, HSG C
	2.221	82	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0483	0.21		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.81"
1.4	171	0.0909	2.11		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.5	271	Total			

Summary for Subcatchment B: B

Runoff = 2.20 cfs @ 12.16 hrs, Volume= 0.110 af, Depth= 1.35"
Routed to Link 1L : NW Offsite

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 2 yr Rainfall=2.84"

	Area (ac)	CN	Description
*	0.067	77	2 acre lots, 12% imp, HSG C, HSG C
*	0.037	98	Paved roads w/curbs & sewers, HSG C, HSG C
*	0.661	82	Row crops, SR + CR, Good, HSG C, HSG C
*	0.021	98	Paved roads w/curbs & sewers, HSG D, HSG D
*	0.191	85	Row crops, SR + CR, Good, HSG D, HSG D
	0.977	83	Weighted Average
	0.911	82	93.24% Pervious Area
	0.066	98	6.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Summary for Subcatchment C: C

[47] Hint: Peak is 479% of capacity of segment #3

Runoff = 29.85 cfs @ 12.27 hrs, Volume= 2.313 af, Depth= 1.59"
Routed to Pond 10P : Offsite Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 2 yr Rainfall=2.84"

	Area (ac)	CN	Description
*	0.064	75	1/4 acre lots, 38% imp, HSG B, HSG B
*	0.161	60	Woods, Fair, HSG B, HSG B
*	13.191	83	1/4 acre lots, 38% imp, HSG C, HSG C
*	0.591	79	Pasture/grassland/range, Fair, HSG C, HSG C
*	0.052	82	Row crops, SR + CR, Good, HSG C, HSG C
*	1.185	98	Water Surface, HSG C, HSG C
*	0.978	87	1/4 acre lots, 38% imp, HSG D, HSG D
*	0.459	84	Pasture/grassland/range, Fair, HSG D, HSG D
*	0.069	85	Row crops, SR + CR, Good, HSG D, HSG D
*	0.705	98	Water Surface, HSG D, HSG D
	17.455	85	Weighted Average
	10.156	75	58.19% Pervious Area
	7.299	98	41.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.3	100	0.2618	0.12		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.81"
2.4	760	0.0653	5.19		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.3	611	0.0219	7.93	6.23	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
18.0	1,471	Total			

Summary for Subcatchment D: D

Runoff = 10.52 cfs @ 12.33 hrs, Volume= 0.893 af, Depth= 1.48"
Routed to Pond 10P : Offsite Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 2 yr Rainfall=2.84"

	Area (ac)	CN	Description
*	4.851	83	1/4 acre lots, 38% imp, HSG C, HSG C
*	0.044	79	Pasture/grassland/range, Fair, HSG C, HSG C
*	1.116	82	Row crops, SR + CR, Good, HSG C, HSG C
	0.035	98	Water Surface, HSG D
*	0.149	87	1/4 acre lots, 38% imp, HSG D, HSG D
*	0.262	84	Pasture/grassland/range, Fair, HSG D, HSG D
*	0.434	85	Row crops, SR + CR, Good, HSG D, HSG D
	0.345	98	Water Surface, HSG D
	7.236	84	Weighted Average
	4.956	77	68.49% Pervious Area
	2.280	98	31.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	100	0.0072	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.81"
6.8	365	0.0161	0.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
22.5	465	Total			

Summary for Subcatchment E: E

Runoff = 32.49 cfs @ 12.48 hrs, Volume= 3.313 af, Depth= 1.06"
Routed to Pond 8P : Wetland

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 2 yr Rainfall=2.84"

	Area (ac)	CN	Description
*	4.308	60	Woods, Fair, HSG B, HSG B
*	0.811	79	1 acre lots, 20% imp, HSG C, HSG C
*	1.643	83	1/4 acre lots, 38% imp, HSG C, HSG C
*	4.947	79	Pasture/grassland/range, Fair, HSG C, HSG C
*	14.620	82	Row crops, SR + CR, Good, HSG C, HSG C
*	5.641	73	Woods, Fair, HSG C, HSG C
*	0.534	87	1/4 acre lots, 38% imp, HSG D, HSG D
*	3.318	84	Pasture/grassland/range, Fair, HSG D, HSG D
*	0.586	85	Row crops, SR + CR, Good, HSG D, HSG D
*	1.192	98	Water Surface, HSG D, HSG D
	37.600	79	Weighted Average
	35.419	77	94.20% Pervious Area
	2.181	98	5.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.0615	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
22.3	1,798	0.0369	1.34		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
32.0	1,898	Total			

Summary for Subcatchment F: F

Runoff = 25.01 cfs @ 12.42 hrs, Volume= 2.343 af, Depth= 1.25"
Routed to Pond 7P : NE Depression

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 2 yr Rainfall=2.84"

	Area (ac)	CN	Description
*	18.698	82	Row crops, SR + CR, Good, HSG C, HSG C
*	3.722	85	Row crops, SR + CR, Good, HSG D, HSG D
	22.420	82	Weighted Average
	22.420	82	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	100	0.0099	0.11		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.81"
14.5	1,330	0.0287	1.52		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
29.8	1,430	Total			

Summary for Subcatchment G: G

Runoff = 15.86 cfs @ 12.55 hrs, Volume= 1.752 af, Depth= 1.30"
Routed to Pond 2P : NW Depression

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 2 yr Rainfall=2.84"

	Area (ac)	CN	Description
*	2.306	79	1 acre lots, 20% imp, HSG C, HSG C
*	0.105	83	1/4 acre lots, 38% imp, HSG C, HSG C
*	1.384	77	2 acre lots, 12% imp, HSG C, HSG C
*	0.470	79	Pasture/grassland/range, Fair, HSG C, HSG C
*	0.422	98	Paved roads w/curbs & sewers, HSG C, HSG C
*	8.483	82	Row crops, SR + CR, Good, HSG C, HSG C
*	0.144	84	1 acre lots, 20% imp, HSG D, HSG D
*	0.637	82	2 acre lots, 12% imp, HSG D, HSG D
*	0.004	84	Pasture/grassland/range, Fair, HSG D, HSG D
*	2.267	85	Row crops, SR + CR, Good, HSG D, HSG D
	16.222	82	Weighted Average
	15.028	81	92.64% Pervious Area
	1.194	98	7.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.7	100	0.0159	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
21.6	1,500	0.0165	1.16		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
38.3	1,600	Total			

Summary for Subcatchment H: H

Runoff = 26.01 cfs @ 12.36 hrs, Volume= 2.225 af, Depth= 1.36"
Routed to Pond 3P : West Pasture Pond

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 2 yr Rainfall=2.84"

	Area (ac)	CN	Description
*	1.289	83	1/4 acre lots, 38% imp, HSG C, HSG C
*	0.756	79	Pasture/grassland/range, Fair, HSG C, HSG C
*	12.853	82	Row crops, SR + CR, Good, HSG C, HSG C
*	0.101	98	Water Surface, HSG C, HSG C
*	0.116	87	1/4 acre lots, 38% imp, HSG D, HSG D
*	0.970	84	Pasture/grassland/range, Fair, HSG D, HSG D
*	2.685	85	Row crops, SR + CR, Good, HSG D, HSG D
*	0.881	98	Water Surface, HSG D, HSG D
	19.651	83	Weighted Average
	18.135	82	92.29% Pervious Area
	1.516	98	7.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0255	0.16		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.81"
14.5	1,141	0.0211	1.31		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
25.0	1,241	Total			

Summary for Subcatchment I: I

Runoff = 10.49 cfs @ 12.17 hrs, Volume= 0.543 af, Depth= 1.27"
Routed to Pond 9P : South Natural Depression

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 2 yr Rainfall=2.84"

	Area (ac)	CN	Description
*	0.929	79	Pasture/grassland/range, Fair, HSG C, HSG C
*	0.069	98	Paved roads w/curbs & sewers, HSG C, HSG C
*	2.655	82	Row crops, SR + CR, Good, HSG C, HSG C
*	1.191	84	Pasture/grassland/range, Fair, HSG D, HSG D
*	0.273	85	Row crops, SR + CR, Good, HSG D, HSG D
	5.117	82	Weighted Average
	5.048	82	98.65% Pervious Area
	0.069	98	1.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0587	0.22		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.81"
1.7	183	0.0417	1.84		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
9.2	283	Total			

Summary for Subcatchment J: J

Runoff = 0.26 cfs @ 12.15 hrs, Volume= 0.014 af, Depth= 1.49"
Routed to Link 1L : NW Offsite

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 2 yr Rainfall=2.84"

	Area (ac)	CN	Description
*	0.115	83	1/4 acre lots, 38% imp, HSG C, HSG C
	0.071	74	62.00% Pervious Area
	0.044	98	38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Summary for Pond 2P: NW Depression

Inflow = 15.86 cfs @ 12.55 hrs, Volume= 2.561 af
Outflow = 6.11 cfs @ 13.60 hrs, Volume= 2.556 af, Atten= 61%, Lag= 62.8 min
Primary = 6.11 cfs @ 13.60 hrs, Volume= 2.556 af
Routed to Link 1L : NW Offsite
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 3P : West Pasture Pond

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Peak Elev= 955.80' @ 13.60 hrs Surf.Area= 1.080 ac Storage= 0.887 af

Plug-Flow detention time= 532.8 min calculated for 2.556 af (100% of inflow)
Center-of-Mass det. time= 530.8 min (1,423.4 - 892.5)

Volume	Invert	Avail.Storage	Storage Description
#1	953.70'	335.460 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
953.70	0.010	0.000	0.000
954.00	0.027	0.006	0.006
955.00	0.486	0.256	0.262
956.00	1.231	0.859	1.121
957.00	2.596	1.913	3.034
958.00	4.430	3.513	6.547
959.00	6.491	5.460	12.008
960.00	7.427	6.959	18.967
961.00	8.137	7.782	26.749
962.00	8.926	8.531	35.280
963.00	9.783	9.355	44.635
964.00	11.177	10.480	55.115
965.00	13.097	12.137	67.252
966.00	13.561	13.329	80.581
967.00	13.786	13.674	94.254
968.00	13.959	13.873	108.127
969.00	14.125	14.042	122.169
970.00	14.261	14.193	136.362
971.00	14.397	14.329	150.691
972.00	14.523	14.460	165.151
973.00	14.645	14.584	179.735
974.00	14.771	14.708	194.443
975.00	14.933	14.852	209.295
976.00	15.273	15.103	224.398
977.00	15.574	15.423	239.821
978.00	15.714	15.644	255.465
979.00	15.819	15.766	271.232
980.00	15.941	15.880	287.112
981.00	16.085	16.013	303.125
982.00	16.181	16.133	319.258
983.00	16.223	16.202	335.460

Device	Routing	Invert	Outlet Devices
#1	Primary	953.98'	**6.0" Round Culvert** L= 233.0' Ke= 0.500 Inlet / Outlet Invert= 953.98' / 953.56' S= 0.0018 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.20 sf
#2	Primary	955.55'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Secondary	956.30'	**50.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=6.11 cfs @ 13.60 hrs HW=955.80' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.25 cfs @ 1.27 fps)
2=Broad-Crested Rectangular Weir (Weir Controls 5.86 cfs @ 1.18 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=953.70' TW=954.20' (Dynamic Tailwater)
3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 3P: West Pasture Pond

Inflow	=	26.01 cfs @	12.36 hrs,	Volume=	2.225 af
Outflow	=	2.80 cfs @	13.70 hrs,	Volume=	0.809 af, Atten= 89%, Lag= 80.1 min
Primary	=	2.80 cfs @	13.70 hrs,	Volume=	0.809 af

Routed to Pond 2P : NW Depression

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Peak Elev= 956.38' @ 13.70 hrs Surf.Area= 1.381 ac Storage= 1.528 af

Plug-Flow detention time= 289.8 min calculated for 0.809 af (36% of inflow)
Center-of-Mass det. time= 190.0 min (1,012.6 - 822.6)

Volume	Invert	Avail.Storage	Storage Description
#1	954.20'	371.513 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
954.20	0.001	0.000	0.000
955.00	0.564	0.226	0.226
956.00	1.093	0.828	1.054
957.00	1.846	1.469	2.524
958.00	2.967	2.406	4.930
959.00	4.272	3.620	8.550
960.00	5.251	4.761	13.311
961.00	6.398	5.824	19.136
962.00	8.200	7.299	26.435
963.00	10.484	9.342	35.777
964.00	12.518	11.501	47.278
965.00	14.886	13.702	60.980
966.00	16.167	15.527	76.506
967.00	16.867	16.517	93.023
968.00	17.280	17.074	110.097
969.00	17.613	17.447	127.543
970.00	17.895	17.754	145.297
971.00	18.085	17.990	163.287
972.00	18.235	18.160	181.447
973.00	18.384	18.310	199.757
974.00	18.521	18.452	218.209
975.00	18.647	18.584	236.793
976.00	18.787	18.717	255.510
977.00	19.020	18.903	274.414
978.00	19.202	19.111	293.525
979.00	19.379	19.290	312.815
980.00	19.533	19.456	332.271
981.00	19.650	19.591	351.863
982.00	19.651	19.650	371.513

Device	Routing	Invert	Outlet Devices
#1	Primary	956.30'	**50.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=2.80 cfs @ 13.70 hrs HW=956.38' TW=955.80' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 2.80 cfs @ 0.67 fps)

Summary for Pond 7P: NE Depression

Inflow = 25.01 cfs @ 12.42 hrs, Volume= 2.343 af
Outflow = 11.20 cfs @ 12.86 hrs, Volume= 1.928 af, Atten= 55%, Lag= 26.1 min
Primary = 11.20 cfs @ 12.86 hrs, Volume= 1.928 af
Routed to Pond 10P : Offsite Detention Pond
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 8P : Wetland
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 3P : West Pasture Pond

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Peak Elev= 962.87' @ 12.86 hrs Surf.Area= 1.760 ac Storage= 0.944 af

Plug-Flow detention time= 139.3 min calculated for 1.928 af (82% of inflow)
Center-of-Mass det. time= 76.4 min (912.4 - 836.0)

Volume	Invert	Avail.Storage	Storage Description
#1	960.60'	263.880 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
960.60	0.001	0.000	0.000
961.00	0.002	0.001	0.001
962.00	0.188	0.095	0.096
963.00	1.992	1.090	1.186
964.00	3.070	2.531	3.717
965.00	3.911	3.490	7.207
966.00	5.064	4.487	11.695
967.00	6.064	5.564	17.259
968.00	7.070	6.567	23.826
969.00	8.282	7.676	31.502
970.00	9.296	8.789	40.291
971.00	10.081	9.688	49.979
972.00	10.717	10.399	60.378
973.00	11.380	11.049	71.427
974.00	12.073	11.726	83.153
975.00	12.863	12.468	95.621
976.00	13.606	13.235	108.856
977.00	14.203	13.904	122.760
978.00	14.710	14.456	137.217
979.00	15.106	14.908	152.125
980.00	15.470	15.288	167.413
981.00	15.707	15.589	183.001
982.00	15.899	15.803	198.804
983.00	16.083	15.991	214.795
984.00	16.269	16.176	230.971
985.00	16.449	16.359	247.330
986.00	16.650	16.549	263.880

Device	Routing	Invert	Outlet Devices
#1	Primary	962.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Secondary	963.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Tertiary	963.60'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=11.20 cfs @ 12.86 hrs HW=962.87' TW=959.15' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 11.20 cfs @ 1.51 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=960.60' TW=959.40' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=960.60' TW=954.20' (Dynamic Tailwater)
↑—**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 8P: Wetland

Inflow	=	32.49 cfs @	12.48 hrs,	Volume=	3.313 af
Outflow	=	27.56 cfs @	12.64 hrs,	Volume=	3.063 af, Atten= 15%, Lag= 9.4 min
Primary	=	27.56 cfs @	12.64 hrs,	Volume=	3.063 af
Routed to Pond 10P : Offsite Detention Pond					
Secondary	=	0.00 cfs @	0.00 hrs,	Volume=	0.000 af
Routed to Pond 7P : NE Depression					

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Peak Elev= 961.64' @ 12.64 hrs Surf.Area= 0.843 ac Storage= 0.661 af

Plug-Flow detention time= 65.9 min calculated for 3.062 af (92% of inflow)
Center-of-Mass det. time= 30.3 min (870.4 - 840.1)

Volume	Invert	Avail.Storage	Storage Description
#1	959.40'	277.352 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
959.40	0.001	0.000	0.000
960.00	0.036	0.011	0.011
961.00	0.442	0.239	0.250
962.00	1.069	0.756	1.006
963.00	1.995	1.532	2.538
964.00	3.064	2.529	5.067
965.00	3.946	3.505	8.572
966.00	4.780	4.363	12.935
967.00	5.386	5.083	18.018
968.00	6.227	5.807	23.825
969.00	7.123	6.675	30.500
970.00	7.839	7.481	37.981
971.00	8.515	8.177	46.158
972.00	9.161	8.838	54.996
973.00	9.761	9.461	64.457
974.00	10.195	9.978	74.435
975.00	10.550	10.372	84.807
976.00	10.935	10.742	95.550
977.00	11.677	11.306	106.856
978.00	12.346	12.011	118.867
979.00	12.873	12.610	131.477
980.00	13.314	13.093	144.570
981.00	13.733	13.523	158.094
982.00	14.085	13.909	172.003
983.00	14.393	14.239	186.242
984.00	14.655	14.524	200.766
985.00	14.910	14.782	215.548
986.00	15.180	15.045	230.593
987.00	15.475	15.327	245.921
988.00	15.714	15.594	261.515
989.00	15.960	15.837	277.352

Device	Routing	Invert	Outlet Devices
#1	Primary	961.00'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Secondary	963.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=27.56 cfs @ 12.64 hrs HW=961.64' TW=958.85' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 27.56 cfs @ 2.16 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=959.40' TW=960.60' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 9P: South Natural Depression

Inflow Area = 5.117 ac, 1.35% Impervious, Inflow Depth = 1.27" for 2 yr event
Inflow = 10.49 cfs @ 12.17 hrs, Volume= 0.543 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 7P : NE Depression

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Peak Elev= 969.42' @ 24.52 hrs Surf.Area= 0.428 ac Storage= 0.542 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	966.10'	54.751 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
966.10	0.000	0.000	0.000
967.00	0.047	0.021	0.021
968.00	0.165	0.106	0.127
969.00	0.342	0.253	0.381
970.00	0.547	0.444	0.825
971.00	0.821	0.684	1.509
972.00	1.184	1.002	2.512
973.00	1.578	1.381	3.893
974.00	1.943	1.761	5.653
975.00	2.299	2.121	7.774
976.00	2.878	2.588	10.363
977.00	3.494	3.186	13.549
978.00	3.871	3.683	17.231
979.00	4.103	3.987	21.218
980.00	4.328	4.215	25.434
981.00	4.616	4.472	29.906
982.00	4.839	4.727	34.633
983.00	4.980	4.909	39.543
984.00	5.048	5.014	44.557
985.00	5.112	5.080	49.637
986.00	5.116	5.114	54.751

Device	Routing	Invert	Outlet Devices
#1	Primary	973.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=966.10' TW=960.60' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 10P: Offsite Detention Pond

Inflow = 52.12 cfs @ 12.57 hrs, Volume= 8.197 af
Outflow = 3.53 cfs @ 16.44 hrs, Volume= 8.081 af, Atten= 93%, Lag= 232.2 min
Primary = 3.53 cfs @ 16.44 hrs, Volume= 8.081 af
Routed to nonexistent node 6L
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 8P : Wetland
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 7P : NE Depression

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Starting Elev= 957.86' Surf.Area= 2.119 ac Storage= 0.916 af
Peak Elev= 959.99' @ 16.44 hrs Surf.Area= 2.937 ac Storage= 6.612 af (5.696 af above start)

Plug-Flow detention time= 1,206.3 min calculated for 7.164 af (87% of inflow)
Center-of-Mass det. time= 1,019.2 min (1,869.1 - 849.9)

Volume	Invert	Avail.Storage	Storage Description
#1	956.80'	597.909 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
956.80	0.001	0.000	0.000
957.00	0.009	0.001	0.001
958.00	2.462	1.235	1.237
959.00	2.703	2.582	3.819
960.00	2.939	2.821	6.640
961.00	3.176	3.058	9.698
962.00	3.479	3.327	13.025
963.00	4.075	3.777	16.802
964.00	4.837	4.456	21.258
965.00	5.851	5.344	26.602
966.00	6.916	6.383	32.986
967.00	7.535	7.226	40.211
968.00	7.804	7.669	47.880
969.00	7.994	7.899	55.779
970.00	8.245	8.120	63.899
971.00	8.854	8.549	72.449
972.00	9.835	9.344	81.793
973.00	11.626	10.730	92.523
974.00	12.519	12.072	104.596
975.00	13.496	13.007	117.603
976.00	14.672	14.084	131.687
977.00	15.761	15.216	146.904
978.00	16.638	16.199	163.103
979.00	17.375	17.006	180.110
980.00	17.982	17.678	197.788
981.00	18.553	18.268	216.056
982.00	19.085	18.819	234.875
983.00	19.424	19.254	254.129
984.00	19.543	19.483	273.613
985.00	19.639	19.591	293.204
986.00	19.730	19.685	312.888
987.00	19.860	19.795	332.683
988.00	19.954	19.907	352.590
989.00	20.014	19.984	372.574
990.00	20.089	20.051	392.626
991.00	20.183	20.136	412.762
992.00	20.278	20.231	432.992
993.00	20.414	20.346	453.338
994.00	20.469	20.441	473.780
995.00	20.522	20.495	494.275
996.00	20.601	20.561	514.837
997.00	20.663	20.632	535.469
998.00	20.746	20.704	556.173
999.00	20.878	20.812	576.985
1,000.00	20.970	20.924	597.909

Device	Routing	Invert	Outlet Devices
#1	Primary	957.86'	**12.0" Round RCP_Round 12"** L= 348.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 957.86' / 956.07' S= 0.0051 '/' Cc= 0.900

n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

#2	Secondary	961.00'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Tertiary	962.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3.53 cfs @ 16.44 hrs HW=959.99' (Free Discharge)
↑—**1=RCP_Round 12"** (Barrel Controls 3.53 cfs @ 4.49 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=957.86' TW=959.40' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=957.86' TW=960.60' (Dynamic Tailwater)
↑—**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 1L: NW Offsite

Inflow = 6.23 cfs @ 13.56 hrs, Volume= 2.679 af
Primary = 6.23 cfs @ 13.57 hrs, Volume= 2.679 af, Atten= 0%, Lag= 0.6 min

Primary outflow = Inflow, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs

Summary for Link 10L: SE Offsite

Inflow Area = 2.221 ac, 0.00% Impervious, Inflow Depth = 1.25" for 2 yr event
Inflow = 4.44 cfs @ 12.17 hrs, Volume= 0.232 af
Primary = 4.44 cfs @ 12.18 hrs, Volume= 0.232 af, Atten= 0%, Lag= 0.6 min

Primary outflow = Inflow, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs

Summary for Subcatchment A: A

Runoff = 8.44 cfs @ 12.17 hrs, Volume= 0.443 af, Depth= 2.39"
Routed to Link 10L : SE Offsite

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 10 yr Rainfall=4.22"

	Area (ac)	CN	Description
*	2.221	82	Row crops, SR + CR, Good, HSG C, HSG C
	2.221	82	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0483	0.21		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.81"
1.4	171	0.0909	2.11		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.5	271	Total			

Summary for Subcatchment B: B

Runoff = 4.07 cfs @ 12.15 hrs, Volume= 0.204 af, Depth= 2.50"
Routed to Link 1L : NW Offsite

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 10 yr Rainfall=4.22"

	Area (ac)	CN	Description
*	0.067	77	2 acre lots, 12% imp, HSG C, HSG C
*	0.037	98	Paved roads w/curbs & sewers, HSG C, HSG C
*	0.661	82	Row crops, SR + CR, Good, HSG C, HSG C
*	0.021	98	Paved roads w/curbs & sewers, HSG D, HSG D
*	0.191	85	Row crops, SR + CR, Good, HSG D, HSG D
	0.977	83	Weighted Average
	0.911	82	93.24% Pervious Area
	0.066	98	6.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Summary for Subcatchment C: C

[47] Hint: Peak is 838% of capacity of segment #3

Runoff = 52.21 cfs @ 12.26 hrs, Volume= 3.975 af, Depth= 2.73"
Routed to Pond 10P : Offsite Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 10 yr Rainfall=4.22"

	Area (ac)	CN	Description
*	0.064	75	1/4 acre lots, 38% imp, HSG B, HSG B
*	0.161	60	Woods, Fair, HSG B, HSG B
*	13.191	83	1/4 acre lots, 38% imp, HSG C, HSG C
*	0.591	79	Pasture/grassland/range, Fair, HSG C, HSG C
*	0.052	82	Row crops, SR + CR, Good, HSG C, HSG C
*	1.185	98	Water Surface, HSG C, HSG C
*	0.978	87	1/4 acre lots, 38% imp, HSG D, HSG D
*	0.459	84	Pasture/grassland/range, Fair, HSG D, HSG D
*	0.069	85	Row crops, SR + CR, Good, HSG D, HSG D
*	0.705	98	Water Surface, HSG D, HSG D
	17.455	85	Weighted Average
	10.156	75	58.19% Pervious Area
	7.299	98	41.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.3	100	0.2618	0.12		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.81"
2.4	760	0.0653	5.19		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.3	611	0.0219	7.93	6.23	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
18.0	1,471	Total			

Summary for Subcatchment D: D

Runoff = 18.94 cfs @ 12.32 hrs, Volume= 1.577 af, Depth= 2.62"
Routed to Pond 10P : Offsite Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 10 yr Rainfall=4.22"

	Area (ac)	CN	Description
*	4.851	83	1/4 acre lots, 38% imp, HSG C, HSG C
*	0.044	79	Pasture/grassland/range, Fair, HSG C, HSG C
*	1.116	82	Row crops, SR + CR, Good, HSG C, HSG C
	0.035	98	Water Surface, HSG D
*	0.149	87	1/4 acre lots, 38% imp, HSG D, HSG D
*	0.262	84	Pasture/grassland/range, Fair, HSG D, HSG D
*	0.434	85	Row crops, SR + CR, Good, HSG D, HSG D
	0.345	98	Water Surface, HSG D
	7.236	84	Weighted Average
	4.956	77	68.49% Pervious Area
	2.280	98	31.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	100	0.0072	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.81"
6.8	365	0.0161	0.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
22.5	465	Total			

Summary for Subcatchment E: E

Runoff = 66.84 cfs @ 12.47 hrs, Volume= 6.585 af, Depth= 2.10"
Routed to Pond 8P : Wetland

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 10 yr Rainfall=4.22"

	Area (ac)	CN	Description
*	4.308	60	Woods, Fair, HSG B, HSG B
*	0.811	79	1 acre lots, 20% imp, HSG C, HSG C
*	1.643	83	1/4 acre lots, 38% imp, HSG C, HSG C
*	4.947	79	Pasture/grassland/range, Fair, HSG C, HSG C
*	14.620	82	Row crops, SR + CR, Good, HSG C, HSG C
*	5.641	73	Woods, Fair, HSG C, HSG C
*	0.534	87	1/4 acre lots, 38% imp, HSG D, HSG D
*	3.318	84	Pasture/grassland/range, Fair, HSG D, HSG D
*	0.586	85	Row crops, SR + CR, Good, HSG D, HSG D
*	1.192	98	Water Surface, HSG D, HSG D
	37.600	79	Weighted Average
	35.419	77	94.20% Pervious Area
	2.181	98	5.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.0615	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
22.3	1,798	0.0369	1.34		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
32.0	1,898	Total			

Summary for Subcatchment F: F

Runoff = 48.36 cfs @ 12.42 hrs, Volume= 4.469 af, Depth= 2.39"
Routed to Pond 7P : NE Depression

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 10 yr Rainfall=4.22"

	Area (ac)	CN	Description
*	18.698	82	Row crops, SR + CR, Good, HSG C, HSG C
*	3.722	85	Row crops, SR + CR, Good, HSG D, HSG D
	22.420	82	Weighted Average
	22.420	82	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	100	0.0099	0.11		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.81"
14.5	1,330	0.0287	1.52		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
29.8	1,430	Total			

Summary for Subcatchment G: G

Runoff = 30.21 cfs @ 12.55 hrs, Volume= 3.287 af, Depth= 2.43"
Routed to Pond 2P : NW Depression

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 10 yr Rainfall=4.22"

	Area (ac)	CN	Description
*	2.306	79	1 acre lots, 20% imp, HSG C, HSG C
*	0.105	83	1/4 acre lots, 38% imp, HSG C, HSG C
*	1.384	77	2 acre lots, 12% imp, HSG C, HSG C
*	0.470	79	Pasture/grassland/range, Fair, HSG C, HSG C
*	0.422	98	Paved roads w/curbs & sewers, HSG C, HSG C
*	8.483	82	Row crops, SR + CR, Good, HSG C, HSG C
*	0.144	84	1 acre lots, 20% imp, HSG D, HSG D
*	0.637	82	2 acre lots, 12% imp, HSG D, HSG D
*	0.004	84	Pasture/grassland/range, Fair, HSG D, HSG D
*	2.267	85	Row crops, SR + CR, Good, HSG D, HSG D
	16.222	82	Weighted Average
	15.028	81	92.64% Pervious Area
	1.194	98	7.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.7	100	0.0159	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
21.6	1,500	0.0165	1.16		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
38.3	1,600	Total			

Summary for Subcatchment H: H

Runoff = 48.65 cfs @ 12.36 hrs, Volume= 4.119 af, Depth= 2.52"
Routed to Pond 3P : West Pasture Pond

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 10 yr Rainfall=4.22"

	Area (ac)	CN	Description
*	1.289	83	1/4 acre lots, 38% imp, HSG C, HSG C
*	0.756	79	Pasture/grassland/range, Fair, HSG C, HSG C
*	12.853	82	Row crops, SR + CR, Good, HSG C, HSG C
*	0.101	98	Water Surface, HSG C, HSG C
*	0.116	87	1/4 acre lots, 38% imp, HSG D, HSG D
*	0.970	84	Pasture/grassland/range, Fair, HSG D, HSG D
*	2.685	85	Row crops, SR + CR, Good, HSG D, HSG D
*	0.881	98	Water Surface, HSG D, HSG D
	19.651	83	Weighted Average
	18.135	82	92.29% Pervious Area
	1.516	98	7.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0255	0.16		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.81"
14.5	1,141	0.0211	1.31		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
25.0	1,241	Total			

Summary for Subcatchment I: I

Runoff = 19.84 cfs @ 12.17 hrs, Volume= 1.029 af, Depth= 2.41"
Routed to Pond 9P : South Natural Depression

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 10 yr Rainfall=4.22"

	Area (ac)	CN	Description
*	0.929	79	Pasture/grassland/range, Fair, HSG C, HSG C
*	0.069	98	Paved roads w/curbs & sewers, HSG C, HSG C
*	2.655	82	Row crops, SR + CR, Good, HSG C, HSG C
*	1.191	84	Pasture/grassland/range, Fair, HSG D, HSG D
*	0.273	85	Row crops, SR + CR, Good, HSG D, HSG D
	5.117	82	Weighted Average
	5.048	82	98.65% Pervious Area
	0.069	98	1.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0587	0.22		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.81"
1.7	183	0.0417	1.84		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
9.2	283	Total			

Summary for Subcatchment J: J

Runoff = 0.47 cfs @ 12.15 hrs, Volume= 0.025 af, Depth= 2.61"
Routed to Link 1L : NW Offsite

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 10 yr Rainfall=4.22"

	Area (ac)	CN	Description
*	0.115	83	1/4 acre lots, 38% imp, HSG C, HSG C
	0.071	74	62.00% Pervious Area
	0.044	98	38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Summary for Pond 2P: NW Depression

Inflow = 52.54 cfs @ 12.63 hrs, Volume= 5.989 af
Outflow = 36.79 cfs @ 12.90 hrs, Volume= 5.983 af, Atten= 30%, Lag= 16.0 min
Primary = 36.79 cfs @ 12.90 hrs, Volume= 5.983 af
Routed to Link 1L : NW Offsite
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 3P : West Pasture Pond

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Peak Elev= 956.32' @ 12.90 hrs Surf.Area= 1.673 ac Storage= 1.590 af

Plug-Flow detention time= 245.1 min calculated for 5.983 af (100% of inflow)
Center-of-Mass det. time= 244.2 min (1,098.8 - 854.6)

Volume	Invert	Avail.Storage	Storage Description
#1	953.70'	335.460 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
953.70	0.010	0.000	0.000
954.00	0.027	0.006	0.006
955.00	0.486	0.256	0.262
956.00	1.231	0.859	1.121
957.00	2.596	1.913	3.034
958.00	4.430	3.513	6.547
959.00	6.491	5.460	12.008
960.00	7.427	6.959	18.967
961.00	8.137	7.782	26.749
962.00	8.926	8.531	35.280
963.00	9.783	9.355	44.635
964.00	11.177	10.480	55.115
965.00	13.097	12.137	67.252
966.00	13.561	13.329	80.581
967.00	13.786	13.674	94.254
968.00	13.959	13.873	108.127
969.00	14.125	14.042	122.169
970.00	14.261	14.193	136.362
971.00	14.397	14.329	150.691
972.00	14.523	14.460	165.151
973.00	14.645	14.584	179.735
974.00	14.771	14.708	194.443
975.00	14.933	14.852	209.295
976.00	15.273	15.103	224.398
977.00	15.574	15.423	239.821
978.00	15.714	15.644	255.465
979.00	15.819	15.766	271.232
980.00	15.941	15.880	287.112
981.00	16.085	16.013	303.125
982.00	16.181	16.133	319.258
983.00	16.223	16.202	335.460

Device	Routing	Invert	Outlet Devices
#1	Primary	953.98'	**6.0" Round Culvert** L= 233.0' Ke= 0.500 Inlet / Outlet Invert= 953.98' / 953.56' S= 0.0018 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.20 sf
#2	Primary	955.55'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Secondary	956.30'	**50.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=36.79 cfs @ 12.90 hrs HW=956.32' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.28 cfs @ 1.45 fps)
2=Broad-Crested Rectangular Weir (Weir Controls 36.50 cfs @ 2.36 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=953.70' TW=954.20' (Dynamic Tailwater)
3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 3P: West Pasture Pond

Inflow	=	48.65 cfs @	12.36 hrs, Volume=	4.119 af
Outflow	=	24.37 cfs @	12.68 hrs, Volume=	2.702 af, Atten= 50%, Lag= 19.0 min
Primary	=	24.37 cfs @	12.68 hrs, Volume=	2.702 af

Routed to Pond 2P : NW Depression

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Peak Elev= 956.64' @ 12.68 hrs Surf.Area= 1.575 ac Storage= 1.909 af

Plug-Flow detention time= 154.6 min calculated for 2.702 af (66% of inflow)
Center-of-Mass det. time= 77.5 min (889.3 - 811.8)

Volume	Invert	Avail.Storage	Storage Description
#1	954.20'	371.513 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
954.20	0.001	0.000	0.000
955.00	0.564	0.226	0.226
956.00	1.093	0.828	1.054
957.00	1.846	1.469	2.524
958.00	2.967	2.406	4.930
959.00	4.272	3.620	8.550
960.00	5.251	4.761	13.311
961.00	6.398	5.824	19.136
962.00	8.200	7.299	26.435
963.00	10.484	9.342	35.777
964.00	12.518	11.501	47.278
965.00	14.886	13.702	60.980
966.00	16.167	15.527	76.506
967.00	16.867	16.517	93.023
968.00	17.280	17.074	110.097
969.00	17.613	17.447	127.543
970.00	17.895	17.754	145.297
971.00	18.085	17.990	163.287
972.00	18.235	18.160	181.447
973.00	18.384	18.310	199.757
974.00	18.521	18.452	218.209
975.00	18.647	18.584	236.793
976.00	18.787	18.717	255.510
977.00	19.020	18.903	274.414
978.00	19.202	19.111	293.525
979.00	19.379	19.290	312.815
980.00	19.533	19.456	332.271
981.00	19.650	19.591	351.863
982.00	19.651	19.650	371.513

Device	Routing	Invert	Outlet Devices
#1	Primary	956.30'	**50.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=24.37 cfs @ 12.68 hrs HW=956.64' TW=956.19' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 24.37 cfs @ 1.43 fps)

Summary for Pond 7P: NE Depression

Inflow = 48.36 cfs @ 12.42 hrs, Volume= 4.469 af
Outflow = 28.84 cfs @ 12.72 hrs, Volume= 4.054 af, Atten= 40%, Lag= 17.9 min
Primary = 28.84 cfs @ 12.72 hrs, Volume= 4.054 af
Routed to Pond 10P : Offsite Detention Pond
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 8P : Wetland
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 3P : West Pasture Pond

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Peak Elev= 963.16' @ 12.72 hrs Surf.Area= 2.164 ac Storage= 1.517 af

Plug-Flow detention time= 94.3 min calculated for 4.054 af (91% of inflow)
Center-of-Mass det. time= 53.9 min (876.6 - 822.8)

Volume	Invert	Avail.Storage	Storage Description
#1	960.60'	263.880 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
960.60	0.001	0.000	0.000
961.00	0.002	0.001	0.001
962.00	0.188	0.095	0.096
963.00	1.992	1.090	1.186
964.00	3.070	2.531	3.717
965.00	3.911	3.490	7.207
966.00	5.064	4.487	11.695
967.00	6.064	5.564	17.259
968.00	7.070	6.567	23.826
969.00	8.282	7.676	31.502
970.00	9.296	8.789	40.291
971.00	10.081	9.688	49.979
972.00	10.717	10.399	60.378
973.00	11.380	11.049	71.427
974.00	12.073	11.726	83.153
975.00	12.863	12.468	95.621
976.00	13.606	13.235	108.856
977.00	14.203	13.904	122.760
978.00	14.710	14.456	137.217
979.00	15.106	14.908	152.125
980.00	15.470	15.288	167.413
981.00	15.707	15.589	183.001
982.00	15.899	15.803	198.804
983.00	16.083	15.991	214.795
984.00	16.269	16.176	230.971
985.00	16.449	16.359	247.330
986.00	16.650	16.549	263.880

Device	Routing	Invert	Outlet Devices
#1	Primary	962.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Secondary	963.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Tertiary	963.60'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=28.84 cfs @ 12.72 hrs HW=963.16' TW=960.17' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 28.84 cfs @ 2.19 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=960.60' TW=959.40' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=960.60' TW=954.20' (Dynamic Tailwater)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 8P: Wetland

[86] Warning: Oscillations may require smaller dt (severity=181)

Inflow	=	66.84 cfs @	12.47 hrs, Volume=	7.568 af
Outflow	=	58.28 cfs @	12.60 hrs, Volume=	7.318 af, Atten= 13%, Lag= 8.1 min
Primary	=	58.28 cfs @	12.60 hrs, Volume=	7.318 af
Routed to Pond 10P : Offsite Detention Pond				
Secondary	=	0.00 cfs @	0.00 hrs, Volume=	0.000 af
Routed to Pond 7P : NE Depression				

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Peak Elev= 962.06' @ 12.60 hrs Surf.Area= 1.124 ac Storage= 1.070 af

Plug-Flow detention time= 93.7 min calculated for 7.317 af (97% of inflow)
Center-of-Mass det. time= 76.6 min (936.6 - 860.0)

Volume	Invert	Avail.Storage	Storage Description
#1	959.40'	277.352 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
959.40	0.001	0.000	0.000
960.00	0.036	0.011	0.011
961.00	0.442	0.239	0.250
962.00	1.069	0.756	1.006
963.00	1.995	1.532	2.538
964.00	3.064	2.529	5.067
965.00	3.946	3.505	8.572
966.00	4.780	4.363	12.935
967.00	5.386	5.083	18.018
968.00	6.227	5.807	23.825
969.00	7.123	6.675	30.500
970.00	7.839	7.481	37.981
971.00	8.515	8.177	46.158
972.00	9.161	8.838	54.996
973.00	9.761	9.461	64.457
974.00	10.195	9.978	74.435
975.00	10.550	10.372	84.807
976.00	10.935	10.742	95.550
977.00	11.677	11.306	106.856
978.00	12.346	12.011	118.867
979.00	12.873	12.610	131.477
980.00	13.314	13.093	144.570
981.00	13.733	13.523	158.094
982.00	14.085	13.909	172.003
983.00	14.393	14.239	186.242
984.00	14.655	14.524	200.766
985.00	14.910	14.782	215.548
986.00	15.180	15.045	230.593
987.00	15.475	15.327	245.921
988.00	15.714	15.594	261.515
989.00	15.960	15.837	277.352

Device	Routing	Invert	Outlet Devices
#1	Primary	961.00'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Secondary	963.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=58.27 cfs @ 12.60 hrs HW=962.06' TW=959.83' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 58.27 cfs @ 2.75 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=959.40' TW=960.60' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 9P: South Natural Depression

Inflow Area = 5.117 ac, 1.35% Impervious, Inflow Depth = 2.41" for 10 yr event
Inflow = 19.84 cfs @ 12.17 hrs, Volume= 1.029 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 7P : NE Depression

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Peak Elev= 970.34' @ 24.52 hrs Surf.Area= 0.641 ac Storage= 1.028 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	966.10'	54.751 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
966.10	0.000	0.000	0.000
967.00	0.047	0.021	0.021
968.00	0.165	0.106	0.127
969.00	0.342	0.253	0.381
970.00	0.547	0.444	0.825
971.00	0.821	0.684	1.509
972.00	1.184	1.002	2.512
973.00	1.578	1.381	3.893
974.00	1.943	1.761	5.653
975.00	2.299	2.121	7.774
976.00	2.878	2.588	10.363
977.00	3.494	3.186	13.549
978.00	3.871	3.683	17.231
979.00	4.103	3.987	21.218
980.00	4.328	4.215	25.434
981.00	4.616	4.472	29.906
982.00	4.839	4.727	34.633
983.00	4.980	4.909	39.543
984.00	5.048	5.014	44.557
985.00	5.112	5.080	49.637
986.00	5.116	5.114	54.751

Device	Routing	Invert	Outlet Devices
#1	Primary	973.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=966.10' TW=960.60' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 10P: Offsite Detention Pond

Inflow = 117.24 cfs @ 12.50 hrs, Volume= 16.924 af
Outflow = 9.52 cfs @ 17.75 hrs, Volume= 16.793 af, Atten= 92%, Lag= 315.0 min
Primary = 4.52 cfs @ 18.26 hrs, Volume= 15.809 af
Routed to nonexistent node 6L
Secondary = 5.00 cfs @ 17.75 hrs, Volume= 0.983 af
Routed to Pond 8P : Wetland
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 7P : NE Depression

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Starting Elev= 957.86' Surf.Area= 2.119 ac Storage= 0.916 af
Peak Elev= 961.87' @ 18.26 hrs Surf.Area= 3.441 ac Storage= 12.589 af (11.673 af above start)

Plug-Flow detention time= 1,428.4 min calculated for 15.877 af (94% of inflow)
Center-of-Mass det. time= 1,306.8 min (2,180.3 - 873.5)

Volume	Invert	Avail.Storage	Storage Description
#1	956.80'	597.909 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
956.80	0.001	0.000	0.000
957.00	0.009	0.001	0.001
958.00	2.462	1.235	1.237
959.00	2.703	2.582	3.819
960.00	2.939	2.821	6.640
961.00	3.176	3.058	9.698
962.00	3.479	3.327	13.025
963.00	4.075	3.777	16.802
964.00	4.837	4.456	21.258
965.00	5.851	5.344	26.602
966.00	6.916	6.383	32.986
967.00	7.535	7.226	40.211
968.00	7.804	7.669	47.880
969.00	7.994	7.899	55.779
970.00	8.245	8.120	63.899
971.00	8.854	8.549	72.449
972.00	9.835	9.344	81.793
973.00	11.626	10.730	92.523
974.00	12.519	12.072	104.596
975.00	13.496	13.007	117.603
976.00	14.672	14.084	131.687
977.00	15.761	15.216	146.904
978.00	16.638	16.199	163.103
979.00	17.375	17.006	180.110
980.00	17.982	17.678	197.788
981.00	18.553	18.268	216.056
982.00	19.085	18.819	234.875
983.00	19.424	19.254	254.129
984.00	19.543	19.483	273.613
985.00	19.639	19.591	293.204
986.00	19.730	19.685	312.888
987.00	19.860	19.795	332.683
988.00	19.954	19.907	352.590
989.00	20.014	19.984	372.574
990.00	20.089	20.051	392.626
991.00	20.183	20.136	412.762
992.00	20.278	20.231	432.992
993.00	20.414	20.346	453.338
994.00	20.469	20.441	473.780
995.00	20.522	20.495	494.275
996.00	20.601	20.561	514.837
997.00	20.663	20.632	535.469
998.00	20.746	20.704	556.173
999.00	20.878	20.812	576.985
1,000.00	20.970	20.924	597.909

Device	Routing	Invert	Outlet Devices
#1	Primary	957.86'	**12.0" Round RCP_Round 12"** L= 348.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 957.86' / 956.07' S= 0.0051 '/' Cc= 0.900

n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

#2	Secondary	961.00'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Tertiary	962.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=4.52 cfs @ 18.26 hrs HW=961.87' (Free Discharge)
1=RCP_Round 12" (Barrel Controls 4.52 cfs @ 5.76 fps)

Secondary OutFlow Max=2.69 cfs @ 17.75 hrs HW=961.87' TW=961.87' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Weir Controls 2.69 cfs @ 0.15 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=957.86' TW=960.60' (Dynamic Tailwater)
3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link 1L: NW Offsite

Inflow = 37.21 cfs @ 12.90 hrs, Volume= 6.212 af
Primary = 37.21 cfs @ 12.91 hrs, Volume= 6.212 af, Atten= 0%, Lag= 0.6 min

Primary outflow = Inflow, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs

Summary for Link 10L: SE Offsite

Inflow Area = 2.221 ac, 0.00% Impervious, Inflow Depth = 2.39" for 10 yr event
Inflow = 8.44 cfs @ 12.17 hrs, Volume= 0.443 af
Primary = 8.44 cfs @ 12.18 hrs, Volume= 0.443 af, Atten= 0%, Lag= 0.6 min

Primary outflow = Inflow, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs

Summary for Subcatchment A: A

Runoff = 0.13 cfs @ 119.90 hrs, Volume= 1.288 af, Depth= 6.96"
Routed to Link 10L : SE Offsite

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
Constant Intensity scaled to 120.00 hrs 10-day snowmelt Rainfall=7.20", AMC=4

	Area (ac)	CN	Adj	Description
*	2.221	82		Row crops, SR + CR, Good, HSG C, HSG C
	2.221	82	98	Weighted Average, AMC Adjusted
	2.221	82	98	100.00% Pervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0483	0.21		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.81"
1.4	171	0.0909	2.11		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.5	271	Total			

Summary for Subcatchment B: B

Runoff = 0.06 cfs @ 119.92 hrs, Volume= 0.567 af, Depth= 6.96"
Routed to Link 1L : NW Offsite

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
Constant Intensity scaled to 120.00 hrs 10-day snowmelt Rainfall=7.20", AMC=4

	Area (ac)	CN	Adj	Description
*	0.067	77		2 acre lots, 12% imp, HSG C, HSG C
*	0.037	98		Paved roads w/curbs & sewers, HSG C, HSG C
*	0.661	82		Row crops, SR + CR, Good, HSG C, HSG C
*	0.021	98		Paved roads w/curbs & sewers, HSG D, HSG D
*	0.191	85		Row crops, SR + CR, Good, HSG D, HSG D
	0.977	83	98	Weighted Average, AMC Adjusted
	0.911	82	98	93.24% Pervious Area, AMC Adjusted
	0.066	98	98	6.76% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Summary for Subcatchment C: C

Runoff = 1.06 cfs @ 120.02 hrs, Volume= 10.125 af, Depth= 6.96"
Routed to Pond 10P : Offsite Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
Constant Intensity scaled to 120.00 hrs 10-day snowmelt Rainfall=7.20", AMC=4

	Area (ac)	CN	Adj	Description
*	0.064	75		1/4 acre lots, 38% imp, HSG B, HSG B
*	0.161	60		Woods, Fair, HSG B, HSG B
*	13.191	83		1/4 acre lots, 38% imp, HSG C, HSG C
*	0.591	79		Pasture/grassland/range, Fair, HSG C, HSG C
*	0.052	82		Row crops, SR + CR, Good, HSG C, HSG C
*	1.185	98		Water Surface, HSG C, HSG C
*	0.978	87		1/4 acre lots, 38% imp, HSG D, HSG D
*	0.459	84		Pasture/grassland/range, Fair, HSG D, HSG D
*	0.069	85		Row crops, SR + CR, Good, HSG D, HSG D
*	0.705	98		Water Surface, HSG D, HSG D
	17.455	85	98	Weighted Average, AMC Adjusted
	10.156	75	98	58.19% Pervious Area, AMC Adjusted
	7.299	98	98	41.81% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.3	100	0.2618	0.12		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.81"
2.4	760	0.0653	5.19		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.3	611	0.0219	7.93	6.23	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
18.0	1,471	Total			

Summary for Subcatchment D: D

Runoff = 0.44 cfs @ 120.03 hrs, Volume= 4.197 af, Depth= 6.96"
Routed to Pond 10P : Offsite Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
Constant Intensity scaled to 120.00 hrs 10-day snowmelt Rainfall=7.20", AMC=4

	Area (ac)	CN	Adj	Description
*	4.851	83		1/4 acre lots, 38% imp, HSG C, HSG C
*	0.044	79		Pasture/grassland/range, Fair, HSG C, HSG C
*	1.116	82		Row crops, SR + CR, Good, HSG C, HSG C
	0.035	98		Water Surface, HSG D
*	0.149	87		1/4 acre lots, 38% imp, HSG D, HSG D
*	0.262	84		Pasture/grassland/range, Fair, HSG D, HSG D
*	0.434	85		Row crops, SR + CR, Good, HSG D, HSG D
	0.345	98		Water Surface, HSG D
	7.236	84	98	Weighted Average, AMC Adjusted
	4.956	77	98	68.49% Pervious Area, AMC Adjusted
	2.280	98	98	31.51% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	100	0.0072	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.81"
6.8	365	0.0161	0.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
22.5	465	Total			

Summary for Subcatchment E: E

Runoff = 2.27 cfs @ 120.00 hrs, Volume= 21.810 af, Depth= 6.96"
Routed to Pond 8P : Wetland

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
Constant Intensity scaled to 120.00 hrs 10-day snowmelt Rainfall=7.20", AMC=4

	Area (ac)	CN	Adj	Description
*	4.308	60		Woods, Fair, HSG B, HSG B
*	0.811	79		1 acre lots, 20% imp, HSG C, HSG C
*	1.643	83		1/4 acre lots, 38% imp, HSG C, HSG C
*	4.947	79		Pasture/grassland/range, Fair, HSG C, HSG C
*	14.620	82		Row crops, SR + CR, Good, HSG C, HSG C
*	5.641	73		Woods, Fair, HSG C, HSG C
*	0.534	87		1/4 acre lots, 38% imp, HSG D, HSG D
*	3.318	84		Pasture/grassland/range, Fair, HSG D, HSG D
*	0.586	85		Row crops, SR + CR, Good, HSG D, HSG D
*	1.192	98		Water Surface, HSG D, HSG D
	37.600	79	98	Weighted Average, AMC Adjusted
	35.419	77	98	94.20% Pervious Area, AMC Adjusted
	2.181	98	98	5.80% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.0615	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
22.3	1,798	0.0369	1.34		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
32.0	1,898	Total			

Summary for Subcatchment F: F

Runoff = 1.36 cfs @ 119.63 hrs, Volume= 13.005 af, Depth= 6.96"
Routed to Pond 7P : NE Depression

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
Constant Intensity scaled to 120.00 hrs 10-day snowmelt Rainfall=7.20", AMC=4

	Area (ac)	CN	Adj	Description
*	18.698	82		Row crops, SR + CR, Good, HSG C, HSG C
*	3.722	85		Row crops, SR + CR, Good, HSG D, HSG D
	22.420	82	98	Weighted Average, AMC Adjusted
	22.420	82	98	100.00% Pervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	100	0.0099	0.11		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.81"
14.5	1,330	0.0287	1.52		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
29.8	1,430	Total			

Summary for Subcatchment G: G

Runoff = 0.98 cfs @ 119.88 hrs, Volume= 9.410 af, Depth= 6.96"
Routed to Pond 2P : NW Depression

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
Constant Intensity scaled to 120.00 hrs 10-day snowmelt Rainfall=7.20", AMC=4

	Area (ac)	CN	Adj	Description
*	2.306	79		1 acre lots, 20% imp, HSG C, HSG C
*	0.105	83		1/4 acre lots, 38% imp, HSG C, HSG C
*	1.384	77		2 acre lots, 12% imp, HSG C, HSG C
*	0.470	79		Pasture/grassland/range, Fair, HSG C, HSG C
*	0.422	98		Paved roads w/curbs & sewers, HSG C, HSG C
*	8.483	82		Row crops, SR + CR, Good, HSG C, HSG C
*	0.144	84		1 acre lots, 20% imp, HSG D, HSG D
*	0.637	82		2 acre lots, 12% imp, HSG D, HSG D
*	0.004	84		Pasture/grassland/range, Fair, HSG D, HSG D
*	2.267	85		Row crops, SR + CR, Good, HSG D, HSG D
	16.222	82	98	Weighted Average, AMC Adjusted
	15.028	81	98	92.64% Pervious Area, AMC Adjusted
	1.194	98	98	7.36% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.7	100	0.0159	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
21.6	1,500	0.0165	1.16		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
38.3	1,600	Total			

Summary for Subcatchment H: H

Runoff = 1.19 cfs @ 119.75 hrs, Volume= 11.399 af, Depth= 6.96"
Routed to Pond 3P : West Pasture Pond

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
Constant Intensity scaled to 120.00 hrs 10-day snowmelt Rainfall=7.20", AMC=4

	Area (ac)	CN	Adj	Description
*	1.289	83		1/4 acre lots, 38% imp, HSG C, HSG C
*	0.756	79		Pasture/grassland/range, Fair, HSG C, HSG C
*	12.853	82		Row crops, SR + CR, Good, HSG C, HSG C
*	0.101	98		Water Surface, HSG C, HSG C
*	0.116	87		1/4 acre lots, 38% imp, HSG D, HSG D
*	0.970	84		Pasture/grassland/range, Fair, HSG D, HSG D
*	2.685	85		Row crops, SR + CR, Good, HSG D, HSG D
*	0.881	98		Water Surface, HSG D, HSG D
	19.651	83	98	Weighted Average, AMC Adjusted
	18.135	82	98	92.29% Pervious Area, AMC Adjusted
	1.516	98	98	7.71% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0255	0.16		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.81"
14.5	1,141	0.0211	1.31		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
25.0	1,241	Total			

Summary for Subcatchment I: I

Runoff = 0.31 cfs @ 119.61 hrs, Volume= 2.968 af, Depth= 6.96"
Routed to Pond 9P : South Natural Depression

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
Constant Intensity scaled to 120.00 hrs 10-day snowmelt Rainfall=7.20", AMC=4

	Area (ac)	CN	Adj	Description
*	0.929	79		Pasture/grassland/range, Fair, HSG C, HSG C
*	0.069	98		Paved roads w/curbs & sewers, HSG C, HSG C
*	2.655	82		Row crops, SR + CR, Good, HSG C, HSG C
*	1.191	84		Pasture/grassland/range, Fair, HSG D, HSG D
*	0.273	85		Row crops, SR + CR, Good, HSG D, HSG D
	5.117	82	98	Weighted Average, AMC Adjusted
	5.048	82	98	98.65% Pervious Area, AMC Adjusted
	0.069	98	98	1.35% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0587	0.22		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.81"
1.7	183	0.0417	1.84		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
9.2	283	Total			

Summary for Subcatchment J: J

Runoff = 0.01 cfs @ 119.92 hrs, Volume= 0.067 af, Depth= 6.96"
Routed to Link 1L : NW Offsite

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
Constant Intensity scaled to 120.00 hrs 10-day snowmelt Rainfall=7.20", AMC=4

	Area (ac)	CN	Adj	Description
*	0.115	83		1/4 acre lots, 38% imp, HSG C, HSG C
	0.115	83	98	Weighted Average, AMC Adjusted
	0.071	74	98	62.00% Pervious Area, AMC Adjusted
	0.044	98	98	38.00% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Summary for Pond 2P: NW Depression

Inflow = 2.17 cfs @ 119.88 hrs, Volume= 19.392 af
Outflow = 2.17 cfs @ 119.99 hrs, Volume= 19.383 af, Atten= 0%, Lag= 6.7 min
Primary = 2.17 cfs @ 119.99 hrs, Volume= 19.383 af
Routed to Link 1L : NW Offsite
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 3P : West Pasture Pond

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Peak Elev= 955.67' @ 119.99 hrs Surf.Area= 0.985 ac Storage= 0.754 af

Plug-Flow detention time= 304.4 min calculated for 19.383 af (100% of inflow)
Center-of-Mass det. time= 302.8 min (4,285.0 - 3,982.2)

Volume	Invert	Avail.Storage	Storage Description
#1	953.70'	335.460 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
953.70	0.010	0.000	0.000
954.00	0.027	0.006	0.006
955.00	0.486	0.256	0.262
956.00	1.231	0.859	1.121
957.00	2.596	1.913	3.034
958.00	4.430	3.513	6.547
959.00	6.491	5.460	12.008
960.00	7.427	6.959	18.967
961.00	8.137	7.782	26.749
962.00	8.926	8.531	35.280
963.00	9.783	9.355	44.635
964.00	11.177	10.480	55.115
965.00	13.097	12.137	67.252
966.00	13.561	13.329	80.581
967.00	13.786	13.674	94.254
968.00	13.959	13.873	108.127
969.00	14.125	14.042	122.169
970.00	14.261	14.193	136.362
971.00	14.397	14.329	150.691
972.00	14.523	14.460	165.151
973.00	14.645	14.584	179.735
974.00	14.771	14.708	194.443
975.00	14.933	14.852	209.295
976.00	15.273	15.103	224.398
977.00	15.574	15.423	239.821
978.00	15.714	15.644	255.465
979.00	15.819	15.766	271.232
980.00	15.941	15.880	287.112
981.00	16.085	16.013	303.125
982.00	16.181	16.133	319.258
983.00	16.223	16.202	335.460

Device	Routing	Invert	Outlet Devices
#1	Primary	953.98'	**6.0" Round Culvert** L= 233.0' Ke= 0.500 Inlet / Outlet Invert= 953.98' / 953.56' S= 0.0018 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.20 sf
#2	Primary	955.55'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Secondary	956.30'	**50.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=2.17 cfs @ 119.99 hrs HW=955.67' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.24 cfs @ 1.22 fps)
2=Broad-Crested Rectangular Weir (Weir Controls 1.93 cfs @ 0.81 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=953.70' TW=954.20' (Dynamic Tailwater)
3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 3P: West Pasture Pond

Inflow = 1.19 cfs @ 119.75 hrs, Volume= 11.399 af
Outflow = 1.19 cfs @ 119.99 hrs, Volume= 9.983 af, Atten= 0%, Lag= 14.5 min
Primary = 1.19 cfs @ 119.99 hrs, Volume= 9.983 af
Routed to Pond 2P : NW Depression

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Peak Elev= 956.35' @ 119.99 hrs Surf.Area= 1.354 ac Storage= 1.479 af

Plug-Flow detention time= 912.4 min calculated for 9.982 af (88% of inflow)
Center-of-Mass det. time= 478.3 min (4,208.3 - 3,730.0)

Volume	Invert	Avail.Storage	Storage Description
#1	954.20'	371.513 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
954.20	0.001	0.000	0.000
955.00	0.564	0.226	0.226
956.00	1.093	0.828	1.054
957.00	1.846	1.469	2.524
958.00	2.967	2.406	4.930
959.00	4.272	3.620	8.550
960.00	5.251	4.761	13.311
961.00	6.398	5.824	19.136
962.00	8.200	7.299	26.435
963.00	10.484	9.342	35.777
964.00	12.518	11.501	47.278
965.00	14.886	13.702	60.980
966.00	16.167	15.527	76.506
967.00	16.867	16.517	93.023
968.00	17.280	17.074	110.097
969.00	17.613	17.447	127.543
970.00	17.895	17.754	145.297
971.00	18.085	17.990	163.287
972.00	18.235	18.160	181.447
973.00	18.384	18.310	199.757
974.00	18.521	18.452	218.209
975.00	18.647	18.584	236.793
976.00	18.787	18.717	255.510
977.00	19.020	18.903	274.414
978.00	19.202	19.111	293.525
979.00	19.379	19.290	312.815
980.00	19.533	19.456	332.271
981.00	19.650	19.591	351.863
982.00	19.651	19.650	371.513

Device	Routing	Invert	Outlet Devices
#1	Primary	956.30'	**50.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=1.19 cfs @ 119.99 hrs HW=956.35' TW=955.67' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 1.19 cfs @ 0.51 fps)

Summary for Pond 7P: NE Depression

Inflow = 1.36 cfs @ 119.63 hrs, Volume= 13.005 af
Outflow = 1.36 cfs @ 120.05 hrs, Volume= 12.590 af, Atten= 0%, Lag= 25.1 min
Primary = 1.36 cfs @ 120.05 hrs, Volume= 12.590 af
Routed to Pond 10P : Offsite Detention Pond
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 8P : Wetland
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 3P : West Pasture Pond

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Peak Elev= 962.59' @ 120.05 hrs Surf.Area= 1.260 ac Storage= 0.526 af

Plug-Flow detention time= 287.4 min calculated for 12.590 af (97% of inflow)
Center-of-Mass det. time= 175.8 min (3,910.3 - 3,734.4)

Volume	Invert	Avail.Storage	Storage Description
#1	960.60'	263.880 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
960.60	0.001	0.000	0.000
961.00	0.002	0.001	0.001
962.00	0.188	0.095	0.096
963.00	1.992	1.090	1.186
964.00	3.070	2.531	3.717
965.00	3.911	3.490	7.207
966.00	5.064	4.487	11.695
967.00	6.064	5.564	17.259
968.00	7.070	6.567	23.826
969.00	8.282	7.676	31.502
970.00	9.296	8.789	40.291
971.00	10.081	9.688	49.979
972.00	10.717	10.399	60.378
973.00	11.380	11.049	71.427
974.00	12.073	11.726	83.153
975.00	12.863	12.468	95.621
976.00	13.606	13.235	108.856
977.00	14.203	13.904	122.760
978.00	14.710	14.456	137.217
979.00	15.106	14.908	152.125
980.00	15.470	15.288	167.413
981.00	15.707	15.589	183.001
982.00	15.899	15.803	198.804
983.00	16.083	15.991	214.795
984.00	16.269	16.176	230.971
985.00	16.449	16.359	247.330
986.00	16.650	16.549	263.880

Device	Routing	Invert	Outlet Devices
#1	Primary	962.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Secondary	963.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Tertiary	963.60'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir**

Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=1.36 cfs @ 120.05 hrs HW=962.59' TW=961.89' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 1.36 cfs @ 0.72 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=960.60' TW=959.40' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=960.60' TW=954.20' (Dynamic Tailwater)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 8P: Wetland

[89] Warning: Qout>Qin may require smaller dt
[86] Warning: Oscillations may require smaller dt (severity=225)

Inflow = 7.34 cfs @ 120.05 hrs, Volume= 22.112 af
Outflow = 8.16 cfs @ 120.06 hrs, Volume= 21.862 af, Atten= 0%, Lag= 0.8 min
Primary = 8.16 cfs @ 120.06 hrs, Volume= 21.862 af
Routed to Pond 10P : Offsite Detention Pond
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 7P : NE Depression

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Peak Elev= 961.90' @ 120.22 hrs Surf.Area= 1.004 ac Storage= 0.899 af

Plug-Flow detention time= 151.1 min calculated for 21.862 af (99% of inflow)
Center-of-Mass det. time= 111.9 min (3,895.1 - 3,783.2)

Volume	Invert	Avail.Storage	Storage Description
#1	959.40'	277.352 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
959.40	0.001	0.000	0.000
960.00	0.036	0.011	0.011
961.00	0.442	0.239	0.250
962.00	1.069	0.756	1.006
963.00	1.995	1.532	2.538
964.00	3.064	2.529	5.067
965.00	3.946	3.505	8.572
966.00	4.780	4.363	12.935
967.00	5.386	5.083	18.018
968.00	6.227	5.807	23.825
969.00	7.123	6.675	30.500
970.00	7.839	7.481	37.981
971.00	8.515	8.177	46.158
972.00	9.161	8.838	54.996
973.00	9.761	9.461	64.457
974.00	10.195	9.978	74.435
975.00	10.550	10.372	84.807
976.00	10.935	10.742	95.550
977.00	11.677	11.306	106.856
978.00	12.346	12.011	118.867
979.00	12.873	12.610	131.477
980.00	13.314	13.093	144.570
981.00	13.733	13.523	158.094
982.00	14.085	13.909	172.003
983.00	14.393	14.239	186.242
984.00	14.655	14.524	200.766
985.00	14.910	14.782	215.548
986.00	15.180	15.045	230.593
987.00	15.475	15.327	245.921
988.00	15.714	15.594	261.515
989.00	15.960	15.837	277.352

Device	Routing	Invert	Outlet Devices
#1	Primary	961.00'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Secondary	963.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=7.56 cfs @ 120.06 hrs HW=961.89' TW=961.89' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 7.56 cfs @ 0.42 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=959.40' TW=960.60' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 9P: South Natural Depression

Inflow Area = 5.117 ac, 1.35% Impervious, Inflow Depth = 6.96" for 10-day snowmelt event
Inflow = 0.31 cfs @ 119.61 hrs, Volume= 2.968 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 7P : NE Depression

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Peak Elev= 972.36' @ 120.53 hrs Surf.Area= 1.327 ac Storage= 2.966 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	966.10'	54.751 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
966.10	0.000	0.000	0.000
967.00	0.047	0.021	0.021
968.00	0.165	0.106	0.127
969.00	0.342	0.253	0.381
970.00	0.547	0.444	0.825
971.00	0.821	0.684	1.509
972.00	1.184	1.002	2.512
973.00	1.578	1.381	3.893
974.00	1.943	1.761	5.653
975.00	2.299	2.121	7.774
976.00	2.878	2.588	10.363
977.00	3.494	3.186	13.549
978.00	3.871	3.683	17.231
979.00	4.103	3.987	21.218
980.00	4.328	4.215	25.434
981.00	4.616	4.472	29.906
982.00	4.839	4.727	34.633
983.00	4.980	4.909	39.543
984.00	5.048	5.014	44.557
985.00	5.112	5.080	49.637
986.00	5.116	5.114	54.751

Device	Routing	Invert	Outlet Devices
#1	Primary	973.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=966.10' TW=960.60' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 10P: Offsite Detention Pond

Inflow = 11.01 cfs @ 120.02 hrs, Volume= 48.775 af
Outflow = 9.61 cfs @ 120.09 hrs, Volume= 48.351 af, Atten= 13%, Lag= 4.0 min
Primary = 4.53 cfs @ 120.20 hrs, Volume= 48.049 af
Routed to nonexistent node 6L
Secondary = 5.07 cfs @ 120.09 hrs, Volume= 0.302 af
Routed to Pond 8P : Wetland
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 7P : NE Depression

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Starting Elev= 957.86' Surf.Area= 2.119 ac Storage= 0.916 af
Peak Elev= 961.89' @ 120.20 hrs Surf.Area= 3.446 ac Storage= 12.650 af (11.734 af above start)

Plug-Flow detention time= 1,567.3 min calculated for 47.432 af (97% of inflow)
Center-of-Mass det. time= 1,380.0 min (5,229.0 - 3,849.0)

Volume	Invert	Avail.Storage	Storage Description
#1	956.80'	597.909 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
956.80	0.001	0.000	0.000
957.00	0.009	0.001	0.001
958.00	2.462	1.235	1.237
959.00	2.703	2.582	3.819
960.00	2.939	2.821	6.640
961.00	3.176	3.058	9.698
962.00	3.479	3.327	13.025
963.00	4.075	3.777	16.802
964.00	4.837	4.456	21.258
965.00	5.851	5.344	26.602
966.00	6.916	6.383	32.986
967.00	7.535	7.226	40.211
968.00	7.804	7.669	47.880
969.00	7.994	7.899	55.779
970.00	8.245	8.120	63.899
971.00	8.854	8.549	72.449
972.00	9.835	9.344	81.793
973.00	11.626	10.730	92.523
974.00	12.519	12.072	104.596
975.00	13.496	13.007	117.603
976.00	14.672	14.084	131.687
977.00	15.761	15.216	146.904
978.00	16.638	16.199	163.103
979.00	17.375	17.006	180.110
980.00	17.982	17.678	197.788
981.00	18.553	18.268	216.056
982.00	19.085	18.819	234.875
983.00	19.424	19.254	254.129
984.00	19.543	19.483	273.613
985.00	19.639	19.591	293.204
986.00	19.730	19.685	312.888
987.00	19.860	19.795	332.683
988.00	19.954	19.907	352.590
989.00	20.014	19.984	372.574
990.00	20.089	20.051	392.626
991.00	20.183	20.136	412.762
992.00	20.278	20.231	432.992
993.00	20.414	20.346	453.338
994.00	20.469	20.441	473.780
995.00	20.522	20.495	494.275
996.00	20.601	20.561	514.837
997.00	20.663	20.632	535.469
998.00	20.746	20.704	556.173
999.00	20.878	20.812	576.985
1,000.00	20.970	20.924	597.909

Device	Routing	Invert	Outlet Devices
#1	Primary	957.86'	**12.0" Round RCP_Round 12"** L= 348.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 957.86' / 956.07' S= 0.0051 '/' Cc= 0.900

n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

#2	Secondary	961.00'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Tertiary	962.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=4.53 cfs @ 120.20 hrs HW=961.89' (Free Discharge)
1=RCP_Round 12" (Barrel Controls 4.53 cfs @ 5.77 fps)

Secondary OutFlow Max=1.93 cfs @ 120.09 hrs HW=961.89' TW=961.89' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Weir Controls 1.93 cfs @ 0.11 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=957.86' TW=960.60' (Dynamic Tailwater)
3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link 1L: NW Offsite

Inflow = 2.23 cfs @ 119.99 hrs, Volume= 20.017 af
Primary = 2.23 cfs @ 120.00 hrs, Volume= 20.017 af, Atten= 0%, Lag= 0.6 min

Primary outflow = Inflow, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs

Summary for Link 10L: SE Offsite

Inflow Area = 2.221 ac, 0.00% Impervious, Inflow Depth = 6.96" for 10-day snowmelt event
Inflow = 0.13 cfs @ 119.90 hrs, Volume= 1.288 af
Primary = 0.13 cfs @ 119.91 hrs, Volume= 1.288 af, Atten= 0%, Lag= 0.6 min

Primary outflow = Inflow, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs

Summary for Subcatchment A: A

Runoff = 16.51 cfs @ 12.17 hrs, Volume= 0.887 af, Depth= 4.79"
Routed to Link 10L : SE Offsite

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 100 yr Rainfall=6.87"

	Area (ac)	CN	Description
*	2.221	82	Row crops, SR + CR, Good, HSG C, HSG C
	2.221	82	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0483	0.21		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.81"
1.4	171	0.0909	2.11		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.5	271	Total			

Summary for Subcatchment B: B

Runoff = 7.83 cfs @ 12.15 hrs, Volume= 0.400 af, Depth= 4.92"
Routed to Link 1L : NW Offsite

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 100 yr Rainfall=6.87"

	Area (ac)	CN	Description
*	0.067	77	2 acre lots, 12% imp, HSG C, HSG C
*	0.037	98	Paved roads w/curbs & sewers, HSG C, HSG C
*	0.661	82	Row crops, SR + CR, Good, HSG C, HSG C
*	0.021	98	Paved roads w/curbs & sewers, HSG D, HSG D
*	0.191	85	Row crops, SR + CR, Good, HSG D, HSG D
	0.977	83	Weighted Average
	0.911	82	93.24% Pervious Area
	0.066	98	6.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Summary for Subcatchment C: C

[47] Hint: Peak is 1577% of capacity of segment #3

Runoff = 98.29 cfs @ 12.26 hrs, Volume= 7.448 af, Depth= 5.12"
Routed to Pond 10P : Offsite Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 100 yr Rainfall=6.87"

	Area (ac)	CN	Description
*	0.064	75	1/4 acre lots, 38% imp, HSG B, HSG B
*	0.161	60	Woods, Fair, HSG B, HSG B
*	13.191	83	1/4 acre lots, 38% imp, HSG C, HSG C
*	0.591	79	Pasture/grassland/range, Fair, HSG C, HSG C
*	0.052	82	Row crops, SR + CR, Good, HSG C, HSG C
*	1.185	98	Water Surface, HSG C, HSG C
*	0.978	87	1/4 acre lots, 38% imp, HSG D, HSG D
*	0.459	84	Pasture/grassland/range, Fair, HSG D, HSG D
*	0.069	85	Row crops, SR + CR, Good, HSG D, HSG D
*	0.705	98	Water Surface, HSG D, HSG D
	17.455	85	Weighted Average
	10.156	75	58.19% Pervious Area
	7.299	98	41.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.3	100	0.2618	0.12		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.81"
2.4	760	0.0653	5.19		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.3	611	0.0219	7.93	6.23	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
18.0	1,471	Total			

Summary for Subcatchment D: D

Runoff = 36.32 cfs @ 12.32 hrs, Volume= 3.015 af, Depth= 5.00"
Routed to Pond 10P : Offsite Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 100 yr Rainfall=6.87"

	Area (ac)	CN	Description
*	4.851	83	1/4 acre lots, 38% imp, HSG C, HSG C
*	0.044	79	Pasture/grassland/range, Fair, HSG C, HSG C
*	1.116	82	Row crops, SR + CR, Good, HSG C, HSG C
	0.035	98	Water Surface, HSG D
*	0.149	87	1/4 acre lots, 38% imp, HSG D, HSG D
*	0.262	84	Pasture/grassland/range, Fair, HSG D, HSG D
*	0.434	85	Row crops, SR + CR, Good, HSG D, HSG D
	0.345	98	Water Surface, HSG D
	7.236	84	Weighted Average
	4.956	77	68.49% Pervious Area
	2.280	98	31.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.7	100	0.0072	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.81"
6.8	365	0.0161	0.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
22.5	465	Total			

Summary for Subcatchment E: E

Runoff = 140.49 cfs @ 12.45 hrs, Volume= 13.747 af, Depth= 4.39"
Routed to Pond 8P : Wetland

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 100 yr Rainfall=6.87"

	Area (ac)	CN	Description
*	4.308	60	Woods, Fair, HSG B, HSG B
*	0.811	79	1 acre lots, 20% imp, HSG C, HSG C
*	1.643	83	1/4 acre lots, 38% imp, HSG C, HSG C
*	4.947	79	Pasture/grassland/range, Fair, HSG C, HSG C
*	14.620	82	Row crops, SR + CR, Good, HSG C, HSG C
*	5.641	73	Woods, Fair, HSG C, HSG C
*	0.534	87	1/4 acre lots, 38% imp, HSG D, HSG D
*	3.318	84	Pasture/grassland/range, Fair, HSG D, HSG D
*	0.586	85	Row crops, SR + CR, Good, HSG D, HSG D
*	1.192	98	Water Surface, HSG D, HSG D
	37.600	79	Weighted Average
	35.419	77	94.20% Pervious Area
	2.181	98	5.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.0615	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
22.3	1,798	0.0369	1.34		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
32.0	1,898	Total			

Summary for Subcatchment F: F

Runoff = 95.91 cfs @ 12.42 hrs, Volume= 8.958 af, Depth= 4.79"
Routed to Pond 7P : NE Depression

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 100 yr Rainfall=6.87"

	Area (ac)	CN	Description
*	18.698	82	Row crops, SR + CR, Good, HSG C, HSG C
*	3.722	85	Row crops, SR + CR, Good, HSG D, HSG D
	22.420	82	Weighted Average
	22.420	82	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.3	100	0.0099	0.11		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.81"
14.5	1,330	0.0287	1.52		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
29.8	1,430	Total			

Summary for Subcatchment G: G

Runoff = 59.59 cfs @ 12.52 hrs, Volume= 6.526 af, Depth= 4.83"
Routed to Pond 2P : NW Depression

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 100 yr Rainfall=6.87"

	Area (ac)	CN	Description
*	2.306	79	1 acre lots, 20% imp, HSG C, HSG C
*	0.105	83	1/4 acre lots, 38% imp, HSG C, HSG C
*	1.384	77	2 acre lots, 12% imp, HSG C, HSG C
*	0.470	79	Pasture/grassland/range, Fair, HSG C, HSG C
*	0.422	98	Paved roads w/curbs & sewers, HSG C, HSG C
*	8.483	82	Row crops, SR + CR, Good, HSG C, HSG C
*	0.144	84	1 acre lots, 20% imp, HSG D, HSG D
*	0.637	82	2 acre lots, 12% imp, HSG D, HSG D
*	0.004	84	Pasture/grassland/range, Fair, HSG D, HSG D
*	2.267	85	Row crops, SR + CR, Good, HSG D, HSG D
	16.222	82	Weighted Average
	15.028	81	92.64% Pervious Area
	1.194	98	7.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.7	100	0.0159	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
21.6	1,500	0.0165	1.16		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
38.3	1,600	Total			

Summary for Subcatchment H: H

Runoff = 94.46 cfs @ 12.36 hrs, Volume= 8.083 af, Depth= 4.94"
Routed to Pond 3P : West Pasture Pond

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 100 yr Rainfall=6.87"

	Area (ac)	CN	Description
*	1.289	83	1/4 acre lots, 38% imp, HSG C, HSG C
*	0.756	79	Pasture/grassland/range, Fair, HSG C, HSG C
*	12.853	82	Row crops, SR + CR, Good, HSG C, HSG C
*	0.101	98	Water Surface, HSG C, HSG C
*	0.116	87	1/4 acre lots, 38% imp, HSG D, HSG D
*	0.970	84	Pasture/grassland/range, Fair, HSG D, HSG D
*	2.685	85	Row crops, SR + CR, Good, HSG D, HSG D
*	0.881	98	Water Surface, HSG D, HSG D
	19.651	83	Weighted Average
	18.135	82	92.29% Pervious Area
	1.516	98	7.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0255	0.16		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.81"
14.5	1,141	0.0211	1.31		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
25.0	1,241	Total			

Summary for Subcatchment I: I

Runoff = 38.66 cfs @ 12.17 hrs, Volume= 2.055 af, Depth= 4.82"
Routed to Pond 9P : South Natural Depression

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 100 yr Rainfall=6.87"

	Area (ac)	CN	Description
*	0.929	79	Pasture/grassland/range, Fair, HSG C, HSG C
*	0.069	98	Paved roads w/curbs & sewers, HSG C, HSG C
*	2.655	82	Row crops, SR + CR, Good, HSG C, HSG C
*	1.191	84	Pasture/grassland/range, Fair, HSG D, HSG D
*	0.273	85	Row crops, SR + CR, Good, HSG D, HSG D
	5.117	82	Weighted Average
	5.048	82	98.65% Pervious Area
	0.069	98	1.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0587	0.22		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.81"
1.7	183	0.0417	1.84		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
9.2	283	Total			

Summary for Subcatchment J: J

Runoff = 0.89 cfs @ 12.15 hrs, Volume= 0.047 af, Depth= 4.96"
Routed to Link 1L : NW Offsite

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 100 yr Rainfall=6.87"

	Area (ac)	CN	Description
*	0.115	83	1/4 acre lots, 38% imp, HSG C, HSG C
	0.071	74	62.00% Pervious Area
	0.044	98	38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Summary for Pond 2P: NW Depression

Inflow = 127.54 cfs @ 12.47 hrs, Volume= 15.452 af
Outflow = 89.76 cfs @ 12.74 hrs, Volume= 15.447 af, Atten= 30%, Lag= 16.3 min
Primary = 89.76 cfs @ 12.74 hrs, Volume= 15.447 af
Routed to Link 1L : NW Offsite
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 3P : West Pasture Pond

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Peak Elev= 956.97' @ 12.74 hrs Surf.Area= 2.552 ac Storage= 2.950 af

Plug-Flow detention time= 111.9 min calculated for 15.446 af (100% of inflow)
Center-of-Mass det. time= 111.9 min (986.9 - 875.0)

Volume	Invert	Avail.Storage	Storage Description
#1	953.70'	335.460 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
953.70	0.010	0.000	0.000
954.00	0.027	0.006	0.006
955.00	0.486	0.256	0.262
956.00	1.231	0.859	1.121
957.00	2.596	1.913	3.034
958.00	4.430	3.513	6.547
959.00	6.491	5.460	12.008
960.00	7.427	6.959	18.967
961.00	8.137	7.782	26.749
962.00	8.926	8.531	35.280
963.00	9.783	9.355	44.635
964.00	11.177	10.480	55.115
965.00	13.097	12.137	67.252
966.00	13.561	13.329	80.581
967.00	13.786	13.674	94.254
968.00	13.959	13.873	108.127
969.00	14.125	14.042	122.169
970.00	14.261	14.193	136.362
971.00	14.397	14.329	150.691
972.00	14.523	14.460	165.151
973.00	14.645	14.584	179.735
974.00	14.771	14.708	194.443
975.00	14.933	14.852	209.295
976.00	15.273	15.103	224.398
977.00	15.574	15.423	239.821
978.00	15.714	15.644	255.465
979.00	15.819	15.766	271.232
980.00	15.941	15.880	287.112
981.00	16.085	16.013	303.125
982.00	16.181	16.133	319.258
983.00	16.223	16.202	335.460

Device	Routing	Invert	Outlet Devices
#1	Primary	953.98'	**6.0" Round Culvert** L= 233.0' Ke= 0.500 Inlet / Outlet Invert= 953.98' / 953.56' S= 0.0018 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.20 sf
#2	Primary	955.55'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Secondary	956.30'	**50.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=89.76 cfs @ 12.74 hrs HW=956.97' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.32 cfs @ 1.64 fps)
2=Broad-Crested Rectangular Weir (Weir Controls 89.44 cfs @ 3.15 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=953.70' TW=954.20' (Dynamic Tailwater)
3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 3P: West Pasture Pond

Inflow = 94.46 cfs @ 12.36 hrs, Volume= 10.342 af
Outflow = 70.35 cfs @ 12.43 hrs, Volume= 8.926 af, Atten= 26%, Lag= 4.2 min
Primary = 70.35 cfs @ 12.43 hrs, Volume= 8.926 af
Routed to Pond 2P : NW Depression

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Peak Elev= 957.05' @ 12.65 hrs Surf.Area= 1.904 ac Storage= 2.621 af

Plug-Flow detention time= 114.1 min calculated for 8.925 af (86% of inflow)
Center-of-Mass det. time= 52.2 min (919.7 - 867.5)

Volume	Invert	Avail.Storage	Storage Description
#1	954.20'	371.513 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
954.20	0.001	0.000	0.000
955.00	0.564	0.226	0.226
956.00	1.093	0.828	1.054
957.00	1.846	1.469	2.524
958.00	2.967	2.406	4.930
959.00	4.272	3.620	8.550
960.00	5.251	4.761	13.311
961.00	6.398	5.824	19.136
962.00	8.200	7.299	26.435
963.00	10.484	9.342	35.777
964.00	12.518	11.501	47.278
965.00	14.886	13.702	60.980
966.00	16.167	15.527	76.506
967.00	16.867	16.517	93.023
968.00	17.280	17.074	110.097
969.00	17.613	17.447	127.543
970.00	17.895	17.754	145.297
971.00	18.085	17.990	163.287
972.00	18.235	18.160	181.447
973.00	18.384	18.310	199.757
974.00	18.521	18.452	218.209
975.00	18.647	18.584	236.793
976.00	18.787	18.717	255.510
977.00	19.020	18.903	274.414
978.00	19.202	19.111	293.525
979.00	19.379	19.290	312.815
980.00	19.533	19.456	332.271
981.00	19.650	19.591	351.863
982.00	19.651	19.650	371.513

Device	Routing	Invert	Outlet Devices
#1	Primary	956.30'	**50.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=68.89 cfs @ 12.43 hrs HW=956.99' TW=956.57' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 68.89 cfs @ 2.00 fps)

Summary for Pond 7P: NE Depression

[86] Warning: Oscillations may require smaller dt (severity=74)

Inflow = 95.91 cfs @ 12.42 hrs, Volume= 16.492 af
Outflow = 64.46 cfs @ 12.66 hrs, Volume= 16.077 af, Atten= 33%, Lag= 14.4 min
Primary = 62.63 cfs @ 12.66 hrs, Volume= 13.300 af
Routed to Pond 10P : Offsite Detention Pond
Secondary = 1.99 cfs @ 16.80 hrs, Volume= 0.518 af
Routed to Pond 8P : Wetland
Tertiary = 3.98 cfs @ 16.89 hrs, Volume= 2.259 af
Routed to Pond 3P : West Pasture Pond

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Peak Elev= 963.79' @ 16.89 hrs Surf.Area= 2.847 ac Storage= 3.105 af

Plug-Flow detention time= 241.8 min calculated for 16.076 af (97% of inflow)
Center-of-Mass det. time= 212.6 min (1,247.7 - 1,035.1)

Volume	Invert	Avail.Storage	Storage Description
#1	960.60'	263.880 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
960.60	0.001	0.000	0.000
961.00	0.002	0.001	0.001
962.00	0.188	0.095	0.096
963.00	1.992	1.090	1.186
964.00	3.070	2.531	3.717
965.00	3.911	3.490	7.207
966.00	5.064	4.487	11.695
967.00	6.064	5.564	17.259
968.00	7.070	6.567	23.826
969.00	8.282	7.676	31.502
970.00	9.296	8.789	40.291
971.00	10.081	9.688	49.979
972.00	10.717	10.399	60.378
973.00	11.380	11.049	71.427
974.00	12.073	11.726	83.153
975.00	12.863	12.468	95.621
976.00	13.606	13.235	108.856
977.00	14.203	13.904	122.760
978.00	14.710	14.456	137.217
979.00	15.106	14.908	152.125
980.00	15.470	15.288	167.413
981.00	15.707	15.589	183.001
982.00	15.899	15.803	198.804
983.00	16.083	15.991	214.795
984.00	16.269	16.176	230.971
985.00	16.449	16.359	247.330
986.00	16.650	16.549	263.880

Device	Routing	Invert	Outlet Devices
#1	Primary	962.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50

Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

#2 Secondary 963.50' **20.0' long x 5.0' breadth Broad-Crested Rectangular Weir**
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

#3 Tertiary 963.60' **20.0' long x 5.0' breadth Broad-Crested Rectangular Weir**
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=62.62 cfs @ 12.66 hrs HW=963.61' TW=962.23' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 62.62 cfs @ 2.81 fps)

Secondary OutFlow Max=0.00 cfs @ 16.80 hrs HW=963.79' TW=963.79' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=3.97 cfs @ 16.89 hrs HW=963.79' TW=956.44' (Dynamic Tailwater)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 3.97 cfs @ 1.03 fps)

Summary for Pond 8P: Wetland

[86] Warning: Oscillations may require smaller dt (severity=258)

Inflow = 140.49 cfs @ 12.45 hrs, Volume= 44.733 af
Outflow = 108.93 cfs @ 12.52 hrs, Volume= 44.482 af, Atten= 22%, Lag= 4.2 min
Primary = 108.93 cfs @ 12.52 hrs, Volume= 43.583 af
Routed to Pond 10P : Offsite Detention Pond
Secondary = 2.94 cfs @ 16.77 hrs, Volume= 0.900 af
Routed to Pond 7P : NE Depression

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Peak Elev= 963.80' @ 16.93 hrs Surf.Area= 2.854 ac Storage= 4.487 af

Plug-Flow detention time= 170.4 min calculated for 44.482 af (99% of inflow)
Center-of-Mass det. time= 160.7 min (1,571.3 - 1,410.5)

Volume	Invert	Avail.Storage	Storage Description
#1	959.40'	277.352 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
959.40	0.001	0.000	0.000
960.00	0.036	0.011	0.011
961.00	0.442	0.239	0.250
962.00	1.069	0.756	1.006
963.00	1.995	1.532	2.538
964.00	3.064	2.529	5.067
965.00	3.946	3.505	8.572
966.00	4.780	4.363	12.935
967.00	5.386	5.083	18.018
968.00	6.227	5.807	23.825
969.00	7.123	6.675	30.500
970.00	7.839	7.481	37.981
971.00	8.515	8.177	46.158
972.00	9.161	8.838	54.996
973.00	9.761	9.461	64.457
974.00	10.195	9.978	74.435
975.00	10.550	10.372	84.807
976.00	10.935	10.742	95.550
977.00	11.677	11.306	106.856
978.00	12.346	12.011	118.867
979.00	12.873	12.610	131.477
980.00	13.314	13.093	144.570
981.00	13.733	13.523	158.094
982.00	14.085	13.909	172.003
983.00	14.393	14.239	186.242
984.00	14.655	14.524	200.766
985.00	14.910	14.782	215.548
986.00	15.180	15.045	230.593
987.00	15.475	15.327	245.921
988.00	15.714	15.594	261.515
989.00	15.960	15.837	277.352

Device	Routing	Invert	Outlet Devices
#1	Primary	961.00'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Secondary	963.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=107.58 cfs @ 12.52 hrs HW=962.68' TW=961.49' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 107.58 cfs @ 3.21 fps)

Secondary OutFlow Max=2.37 cfs @ 16.77 hrs HW=963.80' TW=963.79' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 2.37 cfs @ 0.39 fps)

Summary for Pond 9P: South Natural Depression

Inflow Area = 5.117 ac, 1.35% Impervious, Inflow Depth = 4.82" for 100 yr event
Inflow = 38.66 cfs @ 12.17 hrs, Volume= 2.055 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 7P : NE Depression

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Peak Elev= 971.59' @ 24.52 hrs Surf.Area= 1.034 ac Storage= 2.053 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	966.10'	54.751 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
966.10	0.000	0.000	0.000
967.00	0.047	0.021	0.021
968.00	0.165	0.106	0.127
969.00	0.342	0.253	0.381
970.00	0.547	0.444	0.825
971.00	0.821	0.684	1.509
972.00	1.184	1.002	2.512
973.00	1.578	1.381	3.893
974.00	1.943	1.761	5.653
975.00	2.299	2.121	7.774
976.00	2.878	2.588	10.363
977.00	3.494	3.186	13.549
978.00	3.871	3.683	17.231
979.00	4.103	3.987	21.218
980.00	4.328	4.215	25.434
981.00	4.616	4.472	29.906
982.00	4.839	4.727	34.633
983.00	4.980	4.909	39.543
984.00	5.048	5.014	44.557
985.00	5.112	5.080	49.637
986.00	5.116	5.114	54.751

Device	Routing	Invert	Outlet Devices
#1	Primary	973.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=966.10' TW=960.60' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 10P: Offsite Detention Pond

Inflow = 242.35 cfs @ 12.45 hrs, Volume= 67.346 af
Outflow = 48.82 cfs @ 16.59 hrs, Volume= 67.177 af, Atten= 80%, Lag= 249.0 min
Primary = 5.35 cfs @ 16.95 hrs, Volume= 30.075 af
Routed to nonexistent node 6L
Secondary = 31.30 cfs @ 16.16 hrs, Volume= 30.467 af
Routed to Pond 8P : Wetland
Tertiary = 13.22 cfs @ 16.51 hrs, Volume= 6.635 af
Routed to Pond 7P : NE Depression

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Starting Elev= 957.86' Surf.Area= 2.119 ac Storage= 0.916 af
Peak Elev= 963.80' @ 16.95 hrs Surf.Area= 4.684 ac Storage= 20.300 af (19.384 af above start)

Plug-Flow detention time= 896.8 min calculated for 66.262 af (98% of inflow)
Center-of-Mass det. time= 843.6 min (2,239.6 - 1,395.9)

Volume	Invert	Avail.Storage	Storage Description
#1	956.80'	597.909 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
956.80	0.001	0.000	0.000
957.00	0.009	0.001	0.001
958.00	2.462	1.235	1.237
959.00	2.703	2.582	3.819
960.00	2.939	2.821	6.640
961.00	3.176	3.058	9.698
962.00	3.479	3.327	13.025
963.00	4.075	3.777	16.802
964.00	4.837	4.456	21.258
965.00	5.851	5.344	26.602
966.00	6.916	6.383	32.986
967.00	7.535	7.226	40.211
968.00	7.804	7.669	47.880
969.00	7.994	7.899	55.779
970.00	8.245	8.120	63.899
971.00	8.854	8.549	72.449
972.00	9.835	9.344	81.793
973.00	11.626	10.730	92.523
974.00	12.519	12.072	104.596
975.00	13.496	13.007	117.603
976.00	14.672	14.084	131.687
977.00	15.761	15.216	146.904
978.00	16.638	16.199	163.103
979.00	17.375	17.006	180.110
980.00	17.982	17.678	197.788
981.00	18.553	18.268	216.056
982.00	19.085	18.819	234.875
983.00	19.424	19.254	254.129
984.00	19.543	19.483	273.613
985.00	19.639	19.591	293.204
986.00	19.730	19.685	312.888
987.00	19.860	19.795	332.683
988.00	19.954	19.907	352.590
989.00	20.014	19.984	372.574
990.00	20.089	20.051	392.626
991.00	20.183	20.136	412.762
992.00	20.278	20.231	432.992
993.00	20.414	20.346	453.338
994.00	20.469	20.441	473.780
995.00	20.522	20.495	494.275
996.00	20.601	20.561	514.837
997.00	20.663	20.632	535.469
998.00	20.746	20.704	556.173
999.00	20.878	20.812	576.985
1,000.00	20.970	20.924	597.909

Device	Routing	Invert	Outlet Devices
#1	Primary	957.86'	**12.0" Round RCP_Round 12"** L= 348.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 957.86' / 956.07' S= 0.0051 '/' Cc= 0.900

n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

#2	Secondary	961.00'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Tertiary	962.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=5.35 cfs @ 16.95 hrs HW=963.80' (Free Discharge)
1=RCP_Round 12" (Barrel Controls 5.35 cfs @ 6.82 fps)

Secondary OutFlow Max=24.49 cfs @ 16.16 hrs HW=963.79' TW=963.79' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Weir Controls 24.49 cfs @ 0.44 fps)

Tertiary OutFlow Max=12.75 cfs @ 16.51 hrs HW=963.80' TW=963.79' (Dynamic Tailwater)
3=Broad-Crested Rectangular Weir (Weir Controls 12.75 cfs @ 0.49 fps)

Summary for Link 1L: NW Offsite

Inflow = 90.61 cfs @ 12.74 hrs, Volume= 15.895 af
Primary = 90.61 cfs @ 12.75 hrs, Volume= 15.895 af, Atten= 0%, Lag= 0.6 min

Primary outflow = Inflow, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs

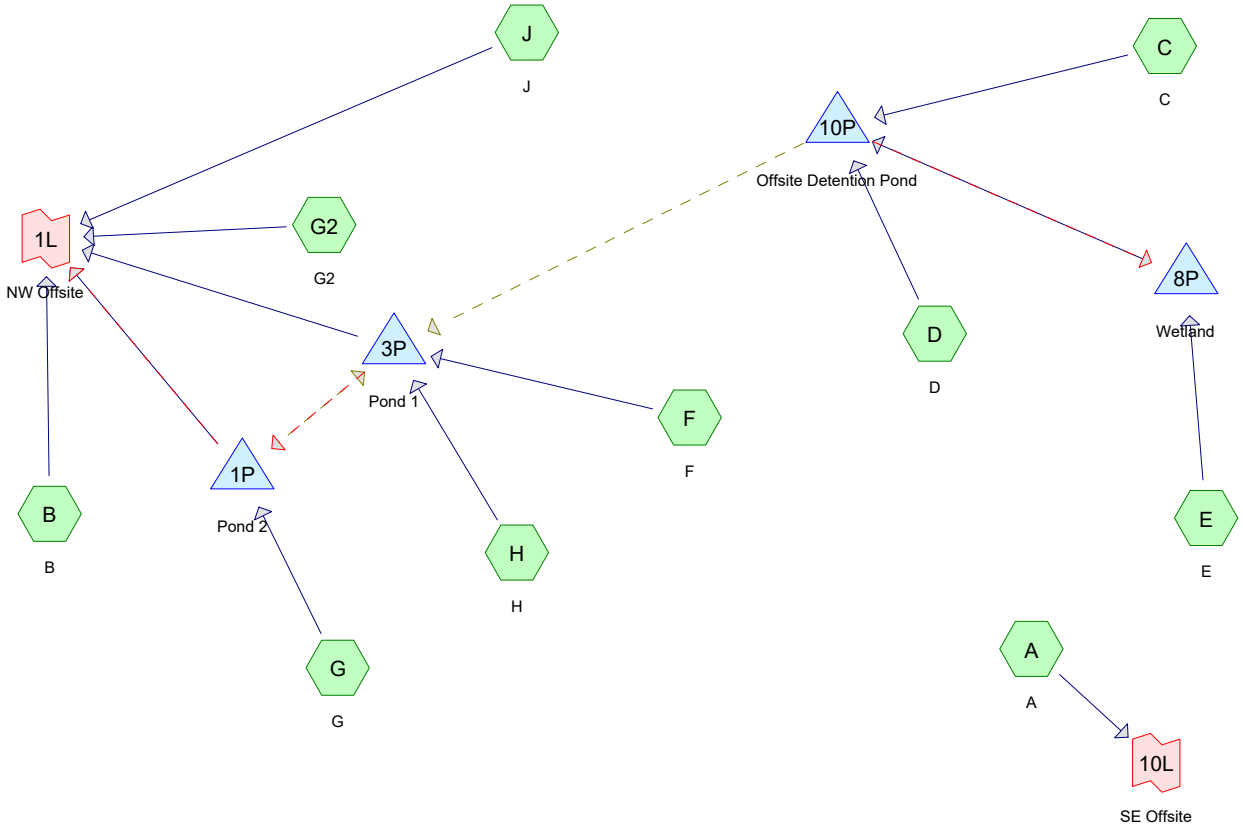
Summary for Link 10L: SE Offsite

Inflow Area = 2.221 ac, 0.00% Impervious, Inflow Depth = 4.79" for 100 yr event
Inflow = 16.51 cfs @ 12.17 hrs, Volume= 0.887 af
Primary = 16.51 cfs @ 12.18 hrs, Volume= 0.887 af, Atten= 0%, Lag= 0.6 min

Primary outflow = Inflow, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs

Appendix B

Drainage Calculations- Proposed Conditions



Subcat Reach Pond Link

Routing Diagram for Post Nelson_7.17.2024
Prepared by Bogart Pederson & Associates, Printed 7/17/2024
HydroCAD® 10.20-5a s/n 02380 © 2023 HydroCAD Software Solutions LLC

Project Notes

Rainfall events imported from "NRCS-Rain.txt" for 5386 MN Wright

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 yr	MSE 24-hr	3	Default	24.00	1	2.84	2
2	10 yr	MSE 24-hr	3	Default	24.00	1	4.22	2
3	100 yr	MSE 24-hr	3	Default	24.00	1	6.87	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.116	79	1 acre lots, 20% imp, HSG C (E, G)
0.144	84	1 acre lots, 20% imp, HSG D (G)
0.064	75	1/4 acre lots, 38% imp, HSG B (C)
21.048	83	1/4 acre lots, 38% imp, HSG C (C, D, E, F, G2, J)
1.779	87	1/4 acre lots, 38% imp, HSG D (C, D, E, F)
1.451	77	2 acre lots, 12% imp, HSG C (B, G)
0.606	82	2 acre lots, 12% imp, HSG D (G)
29.689	74	>75% Grass cover, Good, HSG C (A, B, C, D, E, F, G, G2, H)
7.503	80	>75% Grass cover, Good, HSG D (B, C, D, E, F, G, H)
6.930	79	Pasture/grassland/range, Fair, HSG C (C, D, E, F)
4.649	84	Pasture/grassland/range, Fair, HSG D (C, D, E, F)
12.137	98	Paved parking, HSG C (C, D, E, F, G, G2, H, J)
2.232	98	Paved parking, HSG D (C, E, F, G)
15.345	80	Row crops, SR + CR, Good, HSG C (A, E, F)
0.239	84	Row crops, SR + CR, Good, HSG D (F)
3.939	98	Unconnected pavement, HSG C (B, C, D, E, F, G, G2, H)
0.904	98	Unconnected pavement, HSG D (B, C, D, E, F, G, H)
3.051	98	Water Surface, HSG C (C, D, F, G, H)
4.082	98	Water Surface, HSG D (C, D, E, F, G, H)
4.469	60	Woods, Fair, HSG B (C, E)
5.641	73	Woods, Fair, HSG C (E)
129.018	**82**	**TOTAL AREA**

Time span=0.00-192.00 hrs, dt=0.01 hrs, 19201 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Sim-Route method - Pond routing by Sim-Route method

SubcatchmentA: A Runoff Area=2.111 ac 0.00% Impervious Runoff Depth=1.13"
Flow Length=271' Tc=9.5 min CN=80/0 Runoff=3.78 cfs 0.199 af

SubcatchmentB: B Runoff Area=0.307 ac 2.62% Impervious Runoff Depth=1.17"
Tc=8.0 min CN=80/98 Runoff=0.60 cfs 0.030 af

SubcatchmentC: C Runoff Area=17.688 ac 41.28% Impervious Runoff Depth=1.58"
Flow Length=1,471' Tc=18.0 min CN=75/98 Runoff=30.08 cfs 2.330 af

SubcatchmentD: D Runoff Area=5.091 ac 39.95% Impervious Runoff Depth=1.56"
Flow Length=805' Tc=12.5 min CN=75/98 Runoff=10.16 cfs 0.661 af

SubcatchmentE: E Runoff Area=35.243 ac 6.26% Impervious Runoff Depth=1.02"
Flow Length=1,898' Tc=32.0 min CN=76/98 Runoff=28.95 cfs 2.982 af

SubcatchmentF: F Runoff Area=50.683 ac 28.26% Impervious Runoff Depth=1.47"
Flow Length=2,411' Tc=15.8 min CN=78/98 Runoff=87.45 cfs 6.194 af

SubcatchmentG: G Runoff Area=14.234 ac 29.14% Impervious Runoff Depth=1.44"
Flow Length=1,340' Tc=26.0 min CN=77/98 Runoff=18.49 cfs 1.710 af

SubcatchmentG2: G2 Runoff Area=0.182 ac 41.47% Impervious Runoff Depth=1.71"
Tc=8.0 min CN=79/98 Runoff=0.48 cfs 0.026 af

SubcatchmentH: H Runoff Area=3.437 ac 28.72% Impervious Runoff Depth=1.47"
Flow Length=567' Tc=17.2 min CN=78/98 Runoff=5.71 cfs 0.422 af

SubcatchmentJ: J Runoff Area=0.042 ac 42.43% Impervious Runoff Depth=1.57"
Tc=8.0 min CN=74/98 Runoff=0.10 cfs 0.006 af

Pond 1P: Pond 2 Peak Elev=954.84' Storage=5.583 af Inflow=18.49 cfs 1.710 af
Primary=2.20 cfs 1.687 af Secondary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=2.20 cfs 1.687 af

Pond 3P: Pond 1 Peak Elev=956.79' Storage=8.806 af Inflow=93.11 cfs 6.616 af
Primary=3.08 cfs 6.534 af Secondary=0.00 cfs 0.000 af Outflow=3.08 cfs 6.534 af

Pond 8P: Wetland Peak Elev=961.59' Storage=0.620 af Inflow=28.95 cfs 2.982 af
Outflow=24.40 cfs 2.731 af

Pond 10P: Offsite Detention Pond Peak Elev=959.36' Storage=4.810 af Inflow=40.80 cfs 5.722 af
Primary=3.17 cfs 5.611 af Secondary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=3.17 cfs 5.611 af

Link 1L: NW Offsite Inflow=5.28 cfs 8.282 af
Primary=5.28 cfs 8.282 af

Link 10L: SE Offsite Inflow=3.78 cfs 0.199 af
Primary=3.78 cfs 0.199 af

Total Runoff Area = 129.018 ac Runoff Volume = 14.558 af Average Runoff Depth = 1.35"
75.90% Pervious = 97.919 ac 24.10% Impervious = 31.099 ac

Summary for Subcatchment A: A

Runoff = 3.78 cfs @ 12.17 hrs, Volume= 0.199 af, Depth= 1.13"
Routed to Link 10L : SE Offsite

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 2 yr Rainfall=2.84"

Area (ac)	CN	Description
0.030	74	>75% Grass cover, Good, HSG C
2.081	80	Row crops, SR + CR, Good, HSG C
2.111	80	Weighted Average
2.111	80	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0483	0.21		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.81"
1.4	171	0.0909	2.11		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.5	271	Total			

Summary for Subcatchment B: B

Runoff = 0.60 cfs @ 12.16 hrs, Volume= 0.030 af, Depth= 1.17"
Routed to Link 1L : NW Offsite

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 2 yr Rainfall=2.84"

Area (ac)	CN	Description
0.103	74	>75% Grass cover, Good, HSG C
0.076	80	>75% Grass cover, Good, HSG D
0.067	77	2 acre lots, 12% imp, HSG C
0.037	98	Unconnected pavement, HSG C
0.021	98	Unconnected pavement, HSG D
0.003	98	Unconnected pavement, HSG D
0.307	81	Weighted Average
0.299	80	97.38% Pervious Area
0.008	98	2.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Summary for Subcatchment C: C

[47] Hint: Peak is 483% of capacity of segment #3

Runoff = 30.08 cfs @ 12.27 hrs, Volume= 2.330 af, Depth= 1.58"
Routed to Pond 10P : Offsite Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 2 yr Rainfall=2.84"

Area (ac)	CN	Description
0.210	74	>75% Grass cover, Good, HSG C
0.125	80	>75% Grass cover, Good, HSG D
0.064	75	1/4 acre lots, 38% imp, HSG B
13.191	83	1/4 acre lots, 38% imp, HSG C
0.978	87	1/4 acre lots, 38% imp, HSG D
0.591	79	Pasture/grassland/range, Fair, HSG C
0.440	84	Pasture/grassland/range, Fair, HSG D
1.185	98	Water Surface, HSG C
0.705	98	Water Surface, HSG D
0.161	60	Woods, Fair, HSG B
0.002	98	Paved parking, HSG C
0.001	98	Paved parking, HSG D
0.026	98	Unconnected pavement, HSG C
0.009	98	Unconnected pavement, HSG D
17.688	84	Weighted Average
10.386	75	58.72% Pervious Area
7.302	98	41.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.3	100	0.2618	0.12		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.81"
2.4	760	0.0653	5.19		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.3	611	0.0219	7.93	6.23	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
18.0	1,471	Total			

Summary for Subcatchment D: D

Runoff = 10.16 cfs @ 12.21 hrs, Volume= 0.661 af, Depth= 1.56"
Routed to Pond 10P : Offsite Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 2 yr Rainfall=2.84"

Area (ac)	CN	Description
0.005	74	>75% Grass cover, Good, HSG C
0.017	80	>75% Grass cover, Good, HSG D
4.198	83	1/4 acre lots, 38% imp, HSG C
0.151	87	1/4 acre lots, 38% imp, HSG D
0.044	79	Pasture/grassland/range, Fair, HSG C
0.277	84	Pasture/grassland/range, Fair, HSG D
0.035	98	Water Surface, HSG C
0.345	98	Water Surface, HSG D
0.001	98	Paved parking, HSG C
0.002	98	Unconnected pavement, HSG C
0.016	98	Unconnected pavement, HSG D
5.091	84	Weighted Average
3.057	75	60.05% Pervious Area
2.034	98	39.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	45	0.0072	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.81"
3.7	575	0.0161	2.58		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	185		6.00		**Direct Entry,**
12.5	805	Total			

Summary for Subcatchment E: E

Runoff = 28.95 cfs @ 12.48 hrs, Volume= 2.982 af, Depth= 1.02"
Routed to Pond 8P : Wetland

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 2 yr Rainfall=2.84"

Area (ac)	CN	Description
2.292	74	>75% Grass cover, Good, HSG C
0.327	80	>75% Grass cover, Good, HSG D
0.811	79	1 acre lots, 20% imp, HSG C
1.643	83	1/4 acre lots, 38% imp, HSG C
0.534	87	1/4 acre lots, 38% imp, HSG D
4.895	79	Pasture/grassland/range, Fair, HSG C
2.741	84	Pasture/grassland/range, Fair, HSG D
10.320	80	Row crops, SR + CR, Good, HSG C
1.192	98	Water Surface, HSG D
4.308	60	Woods, Fair, HSG B
5.641	73	Woods, Fair, HSG C
0.021	98	Paved parking, HSG C
0.002	98	Paved parking, HSG D
0.420	98	Unconnected pavement, HSG C
0.096	98	Unconnected pavement, HSG D
35.243	77	Weighted Average
33.039	76	93.74% Pervious Area
2.204	98	6.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.0615	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
22.3	1,798	0.0369	1.34		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
32.0	1,898	Total			

Summary for Subcatchment F: F

Runoff = 87.45 cfs @ 12.24 hrs, Volume= 6.194 af, Depth= 1.47"
Routed to Pond 3P : Pond 1

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 2 yr Rainfall=2.84"

	Area (ac)	CN	Description
*	21.187	74	>75% Grass cover, Good, HSG C
*	5.076	80	>75% Grass cover, Good, HSG D
*	1.881	83	1/4 acre lots, 38% imp, HSG C
*	0.116	87	1/4 acre lots, 38% imp, HSG D
*	1.400	79	Pasture/grassland/range, Fair, HSG C
*	1.191	84	Pasture/grassland/range, Fair, HSG D
*	10.114	98	Paved parking, HSG C
*	1.987	98	Paved parking, HSG D
*	2.944	80	Row crops, SR + CR, Good, HSG C
*	0.239	84	Row crops, SR + CR, Good, HSG D
*	2.471	98	Unconnected pavement, HSG C
*	0.613	98	Unconnected pavement, HSG D
*	1.067	98	Water Surface, HSG C
*	0.397	98	Water Surface, HSG D
	50.683	84	Weighted Average
	36.359	78	71.74% Pervious Area
	14.324	98	28.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	50	0.0099	0.09		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.81"
1.0	200	0.0287	3.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
6.0	2,161		6.00		**Direct Entry,**
15.8	2,411	Total			

Summary for Subcatchment G: G

Runoff = 18.49 cfs @ 12.39 hrs, Volume= 1.710 af, Depth= 1.44"
Routed to Pond 1P : Pond 2

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 2 yr Rainfall=2.84"

Area (ac)	CN	Description
4.301	74	>75% Grass cover, Good, HSG C
1.157	80	>75% Grass cover, Good, HSG D
2.305	79	1 acre lots, 20% imp, HSG C
0.144	84	1 acre lots, 20% imp, HSG D
1.384	77	2 acre lots, 12% imp, HSG C
0.606	82	2 acre lots, 12% imp, HSG D
0.354	98	Unconnected pavement, HSG C
0.663	98	Water Surface, HSG C
0.562	98	Water Surface, HSG D
1.952	98	Paved parking, HSG C
0.242	98	Paved parking, HSG D
0.423	98	Unconnected pavement, HSG C
0.141	98	Unconnected pavement, HSG D
14.234	83	Weighted Average
10.086	77	70.86% Pervious Area
4.148	98	29.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.7	100	0.0159	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
6.9	370	0.0165	0.90		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.4	870		6.00		**Direct Entry,**
26.0	1,340	Total			

Summary for Subcatchment G2: G2

Runoff = 0.48 cfs @ 12.15 hrs, Volume= 0.026 af, Depth= 1.71"
Routed to Link 1L : NW Offsite

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 2 yr Rainfall=2.84"

Area (ac)	CN	Description
0.025	74	>75% Grass cover, Good, HSG C
0.096	83	1/4 acre lots, 38% imp, HSG C
0.039	98	Paved parking, HSG C
0.022	98	Unconnected pavement, HSG C
0.182	87	Weighted Average
0.107	79	58.53% Pervious Area
0.075	98	41.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Summary for Subcatchment H: H

Runoff = 5.71 cfs @ 12.26 hrs, Volume= 0.422 af, Depth= 1.47"
Routed to Pond 3P : Pond 1

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 2 yr Rainfall=2.84"

Area (ac)	CN	Description
1.536	74	>75% Grass cover, Good, HSG C
0.725	80	>75% Grass cover, Good, HSG D
0.101	98	Water Surface, HSG C
0.881	98	Water Surface, HSG D
0.005	98	Paved parking, HSG C
0.184	98	Unconnected pavement, HSG C
0.005	98	Unconnected pavement, HSG D
3.437	83	Weighted Average
2.450	78	71.28% Pervious Area
0.987	98	28.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.0255	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.81"
7.7	467	0.0211	1.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
17.2	567	Total			

Summary for Subcatchment J: J

Runoff = 0.10 cfs @ 12.15 hrs, Volume= 0.006 af, Depth= 1.57"
Routed to Link 1L : NW Offsite

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 2 yr Rainfall=2.84"

Area (ac)	CN	Description
0.039	83	1/4 acre lots, 38% imp, HSG C
0.003	98	Paved parking, HSG C
0.042	84	Weighted Average
0.024	74	57.57% Pervious Area
0.018	98	42.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Summary for Pond 1P: Pond 2

Inflow = 18.49 cfs @ 12.39 hrs, Volume= 1.710 af
Outflow = 2.20 cfs @ 13.62 hrs, Volume= 1.687 af, Atten= 88%, Lag= 74.2 min
Primary = 2.20 cfs @ 13.62 hrs, Volume= 1.687 af
Routed to Link 1L : NW Offsite
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 1L : NW Offsite
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 3P : Pond 1

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Starting Elev= 954.00' Surf.Area= 1.225 ac Storage= 4.523 af
Peak Elev= 954.84' @ 13.62 hrs Surf.Area= 1.298 ac Storage= 5.583 af (1.060 af above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 621.0 min (1,427.7 - 806.7)

Volume	Invert	Avail.Storage	Storage Description
#1	949.00'	25.363 af	**Pond 2 (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
949.00	0.697	0.000	0.000
950.00	0.768	0.732	0.732
951.00	0.852	0.810	1.543
952.00	0.932	0.892	2.435
953.00	1.010	0.971	3.406
954.00	1.225	1.118	4.523
955.00	1.312	1.268	5.791
956.00	1.410	1.361	7.153
957.00	1.686	1.548	8.701
958.00	2.261	1.974	10.674
959.00	2.855	2.558	13.232
960.00	3.020	2.937	16.170
961.00	3.052	3.036	19.206
962.00	3.084	3.068	22.274
963.00	3.095	3.089	25.363

Device	Routing	Invert	Outlet Devices
#1	Primary	954.00'	**24.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 1	954.00'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	955.75'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 1	956.00'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	956.50'	**12.5' long + 4.0 '/' SideZ x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#6	Secondary	958.75'	**100.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

#7 Tertiary 959.00' **90.0' long + 3.0 '/' SideZ x 5.0' breadth Broad-Crested Rectangular Weir**
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=2.20 cfs @ 13.62 hrs HW=954.84' TW=0.00' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Passes 2.20 cfs of 3.91 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 2.20 cfs @ 3.12 fps)
  ├─**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=954.00' TW=0.00' (Dynamic Tailwater)
├─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=954.00' TW=955.00' (Dynamic Tailwater)
└─**7=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 3P: Pond 1

Inflow = 93.11 cfs @ 12.24 hrs, Volume= 6.616 af
Outflow = 3.08 cfs @ 15.23 hrs, Volume= 6.534 af, Atten= 97%, Lag= 179.0 min
Primary = 3.08 cfs @ 15.23 hrs, Volume= 6.534 af
Routed to Link 1L : NW Offsite
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 1P : Pond 2

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Starting Elev= 955.00' Surf.Area= 2.026 ac Storage= 3.994 af
Peak Elev= 956.79' @ 15.23 hrs Surf.Area= 3.423 ac Storage= 8.806 af (4.812 af above start)

Plug-Flow detention time= 2,132.9 min calculated for 2.540 af (38% of inflow)
Center-of-Mass det. time= 1,045.4 min (1,843.2 - 797.8)

Volume	Invert	Avail.Storage	Storage Description
#1	951.00'	56.527 af	**Storage Pond 1 (Prismatic)** Listed below (Recalc)
#2	954.24'	33.838 af	**Existing Wetland (Prismatic)** Listed below (Recalc)
		90.365 af	Total Available Storage

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
951.00	0.651	0.000	0.000
952.00	0.762	0.706	0.706
953.00	0.905	0.834	1.540
954.00	1.056	0.981	2.520
955.00	1.462	1.259	3.779
956.00	1.622	1.542	5.321
957.00	1.983	1.802	7.124
958.00	2.144	2.063	9.187
959.00	2.298	2.221	11.408
960.00	3.049	2.673	14.082
961.00	3.526	3.287	17.369
962.00	3.932	3.729	21.098
963.00	4.259	4.096	25.194
964.00	4.758	4.509	29.702
965.00	5.063	4.910	34.613
966.00	5.280	5.171	39.784
967.00	5.468	5.374	45.158
968.00	5.704	5.586	50.744
969.00	5.862	5.783	56.527

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
954.24	0.001	0.000	0.000
955.00	0.564	0.215	0.215
956.00	1.102	0.833	1.048
957.00	1.623	1.362	2.410
958.00	2.006	1.814	4.225
959.00	2.334	2.170	6.395
960.00	2.587	2.461	8.855
961.00	2.759	2.673	11.528
962.00	2.912	2.835	14.364
963.00	3.024	2.968	17.332
964.00	3.169	3.097	20.428
965.00	3.290	3.230	23.658
966.00	3.383	3.336	26.994
967.00	3.434	3.409	30.403
968.00	3.436	3.435	33.838

Device	Routing	Invert	Outlet Devices
#1	Primary	955.00'	**24.0" Round Culvert** L= 100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 955.00' / 954.00' S= 0.0100 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf
#2	Device 1	955.00'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	957.50'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.5' Crest Height
#4	Device 1	957.75'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	959.00'	**80.0' long + 3.0 '/' SideZ x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3.08 cfs @ 15.23 hrs HW=956.79' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 3.08 cfs of 13.54 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 3.08 cfs @ 5.65 fps)
  - **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  - **4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=955.00' TW=954.00' (Dynamic Tailwater)
- **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 8P: Wetland

Inflow = 28.95 cfs @ 12.48 hrs, Volume= 2.982 af
Outflow = 24.40 cfs @ 12.64 hrs, Volume= 2.731 af, Atten= 16%, Lag= 9.7 min
Primary = 24.40 cfs @ 12.64 hrs, Volume= 2.731 af
Routed to Pond 10P : Offsite Detention Pond

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Peak Elev= 961.59' @ 12.64 hrs Surf.Area= 0.812 ac Storage= 0.620 af

Plug-Flow detention time= 71.3 min calculated for 2.731 af (92% of inflow)
Center-of-Mass det. time= 32.5 min (873.5 - 841.0)

Volume	Invert	Avail.Storage	Storage Description
#1	959.40'	277.352 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
959.40	0.001	0.000	0.000
960.00	0.036	0.011	0.011
961.00	0.442	0.239	0.250
962.00	1.069	0.756	1.006
963.00	1.995	1.532	2.538
964.00	3.064	2.529	5.067
965.00	3.946	3.505	8.572
966.00	4.780	4.363	12.935
967.00	5.386	5.083	18.018
968.00	6.227	5.807	23.825
969.00	7.123	6.675	30.500
970.00	7.839	7.481	37.981
971.00	8.515	8.177	46.158
972.00	9.161	8.838	54.996
973.00	9.761	9.461	64.457
974.00	10.195	9.978	74.435
975.00	10.550	10.372	84.807
976.00	10.935	10.742	95.550
977.00	11.677	11.306	106.856
978.00	12.346	12.011	118.867
979.00	12.873	12.610	131.477
980.00	13.314	13.093	144.570
981.00	13.733	13.523	158.094
982.00	14.085	13.909	172.003
983.00	14.393	14.239	186.242
984.00	14.655	14.524	200.766
985.00	14.910	14.782	215.548
986.00	15.180	15.045	230.593
987.00	15.475	15.327	245.921
988.00	15.714	15.594	261.515
989.00	15.960	15.837	277.352

Device	Routing	Invert	Outlet Devices
#1	Primary	961.00'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=24.40 cfs @ 12.64 hrs HW=961.59' TW=958.76' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 24.40 cfs @ 2.07 fps)

Summary for Pond 10P: Offsite Detention Pond

Inflow = 40.80 cfs @ 12.30 hrs, Volume= 5.722 af
Outflow = 3.17 cfs @ 21.28 hrs, Volume= 5.611 af, Atten= 92%, Lag= 538.9 min
Primary = 3.17 cfs @ 21.28 hrs, Volume= 5.611 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 8P : Wetland
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 3P : Pond 1

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Starting Elev= 957.86' Surf.Area= 2.119 ac Storage= 0.916 af
Peak Elev= 959.36' @ 15.40 hrs Surf.Area= 2.788 ac Storage= 4.810 af (3.894 af above start)

Plug-Flow detention time= 1,179.0 min calculated for 4.695 af (82% of inflow)
Center-of-Mass det. time= 934.1 min (1,763.3 - 829.2)

Volume	Invert	Avail.Storage	Storage Description
#1	956.84'	629.602 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
956.84	0.001	0.000	0.000
957.00	0.009	0.001	0.001
958.00	2.462	1.235	1.236
959.00	2.703	2.582	3.819
960.00	2.939	2.821	6.640
961.00	3.176	3.058	9.697
962.00	3.494	3.335	13.032
963.00	3.812	3.653	16.685
964.00	4.246	4.029	20.714
965.00	4.959	4.603	25.317
966.00	6.092	5.526	30.842
967.00	6.980	6.536	37.378
968.00	7.556	7.268	44.646
969.00	7.997	7.776	52.423
970.00	8.442	8.220	60.642
971.00	9.175	8.808	69.451
972.00	10.268	9.722	79.172
973.00	12.244	11.256	90.428
974.00	13.280	12.762	103.190
975.00	14.394	13.837	117.027
976.00	15.690	15.042	132.069
977.00	16.919	16.304	148.374
978.00	17.912	17.415	165.789
979.00	18.694	18.303	184.092
980.00	19.301	18.998	203.090
981.00	19.872	19.586	222.676
982.00	20.405	20.139	242.815
983.00	20.744	20.574	263.389
984.00	20.863	20.803	284.193
985.00	20.959	20.911	305.104
986.00	21.049	21.004	326.108
987.00	21.179	21.114	347.222
988.00	21.273	21.226	368.448
989.00	21.334	21.303	389.751
990.00	21.409	21.372	411.123
991.00	21.502	21.456	432.578
992.00	21.597	21.549	454.128
993.00	21.734	21.665	475.793
994.00	21.789	21.761	497.555
995.00	21.842	21.815	519.370
996.00	21.920	21.881	541.251
997.00	21.983	21.951	563.203
998.00	22.065	22.024	585.227
999.00	22.198	22.131	607.358
1,000.00	22.290	22.244	629.602

Device	Routing	Invert	Outlet Devices
#1	Primary	957.86'	**12.0" Round RCP_Round 12"** L= 348.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 957.86' / 956.07' S= 0.0051 '/' Cc= 0.900

			n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Secondary	961.00'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Tertiary	963.00'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3.17 cfs @ 21.28 hrs HW=959.13' (Free Discharge)
1=RCP_Round 12" (Barrel Controls 3.17 cfs @ 4.11 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=957.86' TW=959.40' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=957.86' TW=955.00' (Dynamic Tailwater)
3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link 1L: NW Offsite

Inflow	=	5.28 cfs @	13.57 hrs,	Volume=	8.282 af
Primary	=	5.28 cfs @	13.58 hrs,	Volume=	8.282 af, Atten= 0%, Lag= 0.6 min

Primary outflow = Inflow, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs

Summary for Link 10L: SE Offsite

Inflow Area = 2.111 ac, 0.00% Impervious, Inflow Depth = 1.13" for 2 yr event
Inflow = 3.78 cfs @ 12.17 hrs, Volume= 0.199 af
Primary = 3.78 cfs @ 12.18 hrs, Volume= 0.199 af, Atten= 0%, Lag= 0.6 min

Primary outflow = Inflow, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs

Time span=0.00-192.00 hrs, dt=0.01 hrs, 19201 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Sim-Route method - Pond routing by Sim-Route method

SubcatchmentA: A Runoff Area=2.111 ac 0.00% Impervious Runoff Depth=2.22"
Flow Length=271' Tc=9.5 min CN=80/0 Runoff=7.48 cfs 0.391 af

SubcatchmentB: B Runoff Area=0.307 ac 2.62% Impervious Runoff Depth=2.27"
Tc=8.0 min CN=80/98 Runoff=1.18 cfs 0.058 af

SubcatchmentC: C Runoff Area=17.688 ac 41.28% Impervious Runoff Depth=2.72"
Flow Length=1,471' Tc=18.0 min CN=75/98 Runoff=52.72 cfs 4.011 af

SubcatchmentD: D Runoff Area=5.091 ac 39.95% Impervious Runoff Depth=2.69"
Flow Length=805' Tc=12.5 min CN=75/98 Runoff=17.83 cfs 1.142 af

SubcatchmentE: E Runoff Area=35.243 ac 6.26% Impervious Runoff Depth=2.04"
Flow Length=1,898' Tc=32.0 min CN=76/98 Runoff=60.54 cfs 5.987 af

SubcatchmentF: F Runoff Area=50.683 ac 28.26% Impervious Runoff Depth=2.61"
Flow Length=2,411' Tc=15.8 min CN=78/98 Runoff=157.94 cfs 11.009 af

SubcatchmentG: G Runoff Area=14.234 ac 29.14% Impervious Runoff Depth=2.57"
Flow Length=1,340' Tc=26.0 min CN=77/98 Runoff=33.60 cfs 3.046 af

SubcatchmentG2: G2 Runoff Area=0.182 ac 41.47% Impervious Runoff Depth=2.91"
Tc=8.0 min CN=79/98 Runoff=0.83 cfs 0.044 af

SubcatchmentH: H Runoff Area=3.437 ac 28.72% Impervious Runoff Depth=2.62"
Flow Length=567' Tc=17.2 min CN=78/98 Runoff=10.30 cfs 0.749 af

SubcatchmentJ: J Runoff Area=0.042 ac 42.43% Impervious Runoff Depth=2.70"
Tc=8.0 min CN=74/98 Runoff=0.18 cfs 0.009 af

Pond 1P: Pond 2 Peak Elev=955.48' Storage=6.428 af Inflow=33.60 cfs 3.046 af
Primary=3.74 cfs 3.023 af Secondary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=3.74 cfs 3.023 af

Pond 3P: Pond 1 Peak Elev=957.78' Storage=12.529 af Inflow=168.14 cfs 11.758 af
Primary=6.80 cfs 11.670 af Secondary=0.00 cfs 0.000 af Outflow=6.80 cfs 11.670 af

Pond 8P: Wetland Peak Elev=961.99' Storage=0.996 af Inflow=60.54 cfs 5.987 af
Outflow=52.91 cfs 5.737 af

Pond 10P: Offsite Detention Pond Peak Elev=960.78' Storage=9.008 af Inflow=90.30 cfs 10.891 af
Primary=3.98 cfs 10.770 af Secondary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=3.98 cfs 10.770 af

Link 1L: NW Offsite Inflow=10.50 cfs 14.804 af
Primary=10.50 cfs 14.804 af

Link 10L: SE Offsite Inflow=7.48 cfs 0.391 af
Primary=7.48 cfs 0.391 af

Total Runoff Area = 129.018 ac Runoff Volume = 26.448 af Average Runoff Depth = 2.46"
75.90% Pervious = 97.919 ac 24.10% Impervious = 31.099 ac

Summary for Subcatchment A: A

Runoff = 7.48 cfs @ 12.17 hrs, Volume= 0.391 af, Depth= 2.22"
Routed to Link 10L : SE Offsite

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 10 yr Rainfall=4.22"

Area (ac)	CN	Description
0.030	74	>75% Grass cover, Good, HSG C
2.081	80	Row crops, SR + CR, Good, HSG C
2.111	80	Weighted Average
2.111	80	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0483	0.21		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.81"
1.4	171	0.0909	2.11		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.5	271	Total			

Summary for Subcatchment B: B

Runoff = 1.18 cfs @ 12.15 hrs, Volume= 0.058 af, Depth= 2.27"
Routed to Link 1L : NW Offsite

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 10 yr Rainfall=4.22"

Area (ac)	CN	Description
0.103	74	>75% Grass cover, Good, HSG C
0.076	80	>75% Grass cover, Good, HSG D
0.067	77	2 acre lots, 12% imp, HSG C
0.037	98	Unconnected pavement, HSG C
0.021	98	Unconnected pavement, HSG D
0.003	98	Unconnected pavement, HSG D
0.307	81	Weighted Average
0.299	80	97.38% Pervious Area
0.008	98	2.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Summary for Subcatchment C: C

[47] Hint: Peak is 846% of capacity of segment #3

Runoff = 52.72 cfs @ 12.26 hrs, Volume= 4.011 af, Depth= 2.72"
Routed to Pond 10P : Offsite Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 10 yr Rainfall=4.22"

Area (ac)	CN	Description
0.210	74	>75% Grass cover, Good, HSG C
0.125	80	>75% Grass cover, Good, HSG D
0.064	75	1/4 acre lots, 38% imp, HSG B
13.191	83	1/4 acre lots, 38% imp, HSG C
0.978	87	1/4 acre lots, 38% imp, HSG D
0.591	79	Pasture/grassland/range, Fair, HSG C
0.440	84	Pasture/grassland/range, Fair, HSG D
1.185	98	Water Surface, HSG C
0.705	98	Water Surface, HSG D
0.161	60	Woods, Fair, HSG B
0.002	98	Paved parking, HSG C
0.001	98	Paved parking, HSG D
0.026	98	Unconnected pavement, HSG C
0.009	98	Unconnected pavement, HSG D
17.688	84	Weighted Average
10.386	75	58.72% Pervious Area
7.302	98	41.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.3	100	0.2618	0.12		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.81"
2.4	760	0.0653	5.19		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.3	611	0.0219	7.93	6.23	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
18.0	1,471	Total			

Summary for Subcatchment D: D

Runoff = 17.83 cfs @ 12.20 hrs, Volume= 1.142 af, Depth= 2.69"
Routed to Pond 10P : Offsite Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 10 yr Rainfall=4.22"

Area (ac)	CN	Description
0.005	74	>75% Grass cover, Good, HSG C
0.017	80	>75% Grass cover, Good, HSG D
4.198	83	1/4 acre lots, 38% imp, HSG C
0.151	87	1/4 acre lots, 38% imp, HSG D
0.044	79	Pasture/grassland/range, Fair, HSG C
0.277	84	Pasture/grassland/range, Fair, HSG D
0.035	98	Water Surface, HSG C
0.345	98	Water Surface, HSG D
0.001	98	Paved parking, HSG C
0.002	98	Unconnected pavement, HSG C
0.016	98	Unconnected pavement, HSG D
5.091	84	Weighted Average
3.057	75	60.05% Pervious Area
2.034	98	39.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	45	0.0072	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.81"
3.7	575	0.0161	2.58		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	185		6.00		**Direct Entry,**
12.5	805	Total			

Summary for Subcatchment E: E

Runoff = 60.54 cfs @ 12.47 hrs, Volume= 5.987 af, Depth= 2.04"
Routed to Pond 8P : Wetland

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 10 yr Rainfall=4.22"

Area (ac)	CN	Description
2.292	74	>75% Grass cover, Good, HSG C
0.327	80	>75% Grass cover, Good, HSG D
0.811	79	1 acre lots, 20% imp, HSG C
1.643	83	1/4 acre lots, 38% imp, HSG C
0.534	87	1/4 acre lots, 38% imp, HSG D
4.895	79	Pasture/grassland/range, Fair, HSG C
2.741	84	Pasture/grassland/range, Fair, HSG D
10.320	80	Row crops, SR + CR, Good, HSG C
1.192	98	Water Surface, HSG D
4.308	60	Woods, Fair, HSG B
5.641	73	Woods, Fair, HSG C
0.021	98	Paved parking, HSG C
0.002	98	Paved parking, HSG D
0.420	98	Unconnected pavement, HSG C
0.096	98	Unconnected pavement, HSG D
35.243	77	Weighted Average
33.039	76	93.74% Pervious Area
2.204	98	6.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.0615	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
22.3	1,798	0.0369	1.34		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
32.0	1,898	Total			

Summary for Subcatchment F: F

Runoff = 157.94 cfs @ 12.24 hrs, Volume= 11.009 af, Depth= 2.61"
Routed to Pond 3P : Pond 1

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 10 yr Rainfall=4.22"

	Area (ac)	CN	Description
*	21.187	74	>75% Grass cover, Good, HSG C
*	5.076	80	>75% Grass cover, Good, HSG D
*	1.881	83	1/4 acre lots, 38% imp, HSG C
*	0.116	87	1/4 acre lots, 38% imp, HSG D
*	1.400	79	Pasture/grassland/range, Fair, HSG C
*	1.191	84	Pasture/grassland/range, Fair, HSG D
*	10.114	98	Paved parking, HSG C
*	1.987	98	Paved parking, HSG D
*	2.944	80	Row crops, SR + CR, Good, HSG C
*	0.239	84	Row crops, SR + CR, Good, HSG D
*	2.471	98	Unconnected pavement, HSG C
*	0.613	98	Unconnected pavement, HSG D
*	1.067	98	Water Surface, HSG C
*	0.397	98	Water Surface, HSG D
	50.683	84	Weighted Average
	36.359	78	71.74% Pervious Area
	14.324	98	28.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	50	0.0099	0.09		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.81"
1.0	200	0.0287	3.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
6.0	2,161		6.00		**Direct Entry,**
15.8	2,411	Total			

Summary for Subcatchment G: G

Runoff = 33.60 cfs @ 12.37 hrs, Volume= 3.046 af, Depth= 2.57"
Routed to Pond 1P : Pond 2

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 10 yr Rainfall=4.22"

Area (ac)	CN	Description
4.301	74	>75% Grass cover, Good, HSG C
1.157	80	>75% Grass cover, Good, HSG D
2.305	79	1 acre lots, 20% imp, HSG C
0.144	84	1 acre lots, 20% imp, HSG D
1.384	77	2 acre lots, 12% imp, HSG C
0.606	82	2 acre lots, 12% imp, HSG D
0.354	98	Unconnected pavement, HSG C
0.663	98	Water Surface, HSG C
0.562	98	Water Surface, HSG D
1.952	98	Paved parking, HSG C
0.242	98	Paved parking, HSG D
0.423	98	Unconnected pavement, HSG C
0.141	98	Unconnected pavement, HSG D
14.234	83	Weighted Average
10.086	77	70.86% Pervious Area
4.148	98	29.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.7	100	0.0159	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
6.9	370	0.0165	0.90		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.4	870		6.00		**Direct Entry,**
26.0	1,340	Total			

Summary for Subcatchment G2: G2

Runoff = 0.83 cfs @ 12.15 hrs, Volume= 0.044 af, Depth= 2.91"
Routed to Link 1L : NW Offsite

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 10 yr Rainfall=4.22"

Area (ac)	CN	Description
0.025	74	>75% Grass cover, Good, HSG C
0.096	83	1/4 acre lots, 38% imp, HSG C
0.039	98	Paved parking, HSG C
0.022	98	Unconnected pavement, HSG C
0.182	87	Weighted Average
0.107	79	58.53% Pervious Area
0.075	98	41.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Summary for Subcatchment H: H

Runoff = 10.30 cfs @ 12.25 hrs, Volume= 0.749 af, Depth= 2.62"
Routed to Pond 3P : Pond 1

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 10 yr Rainfall=4.22"

Area (ac)	CN	Description
1.536	74	>75% Grass cover, Good, HSG C
0.725	80	>75% Grass cover, Good, HSG D
0.101	98	Water Surface, HSG C
0.881	98	Water Surface, HSG D
0.005	98	Paved parking, HSG C
0.184	98	Unconnected pavement, HSG C
0.005	98	Unconnected pavement, HSG D
3.437	83	Weighted Average
2.450	78	71.28% Pervious Area
0.987	98	28.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.0255	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.81"
7.7	467	0.0211	1.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
17.2	567	Total			

Summary for Subcatchment J: J

Runoff = 0.18 cfs @ 12.15 hrs, Volume= 0.009 af, Depth= 2.70"
Routed to Link 1L : NW Offsite

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 10 yr Rainfall=4.22"

Area (ac)	CN	Description
0.039	83	1/4 acre lots, 38% imp, HSG C
0.003	98	Paved parking, HSG C
0.042	84	Weighted Average
0.024	74	57.57% Pervious Area
0.018	98	42.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Summary for Pond 1P: Pond 2

Inflow = 33.60 cfs @ 12.37 hrs, Volume= 3.046 af
Outflow = 3.74 cfs @ 13.62 hrs, Volume= 3.023 af, Atten= 89%, Lag= 75.0 min
Primary = 3.74 cfs @ 13.62 hrs, Volume= 3.023 af
Routed to Link 1L : NW Offsite
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 1L : NW Offsite
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 3P : Pond 1

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Starting Elev= 954.00' Surf.Area= 1.225 ac Storage= 4.523 af
Peak Elev= 955.48' @ 13.62 hrs Surf.Area= 1.359 ac Storage= 6.428 af (1.905 af above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 498.1 min (1,298.8 - 800.7)

Volume	Invert	Avail.Storage	Storage Description
#1	949.00'	25.363 af	**Pond 2 (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
949.00	0.697	0.000	0.000
950.00	0.768	0.732	0.732
951.00	0.852	0.810	1.543
952.00	0.932	0.892	2.435
953.00	1.010	0.971	3.406
954.00	1.225	1.118	4.523
955.00	1.312	1.268	5.791
956.00	1.410	1.361	7.153
957.00	1.686	1.548	8.701
958.00	2.261	1.974	10.674
959.00	2.855	2.558	13.232
960.00	3.020	2.937	16.170
961.00	3.052	3.036	19.206
962.00	3.084	3.068	22.274
963.00	3.095	3.089	25.363

Device	Routing	Invert	Outlet Devices
#1	Primary	954.00'	**24.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 1	954.00'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	955.75'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 1	956.00'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	956.50'	**12.5' long + 4.0 '/' SideZ x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#6	Secondary	958.75'	**100.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

#7 Tertiary 959.00' **90.0' long + 3.0 '/' SideZ x 5.0' breadth Broad-Crested Rectangular Weir**
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3.74 cfs @ 13.62 hrs HW=955.48' TW=0.00' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Passes 3.74 cfs of 10.29 cfs potential flow)
  └─**2=Orifice/Grate** (Orifice Controls 3.74 cfs @ 4.76 fps)
  ├─**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=954.00' TW=0.00' (Dynamic Tailwater)
├─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=954.00' TW=955.00' (Dynamic Tailwater)
└─**7=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 3P: Pond 1

Inflow = 168.14 cfs @ 12.24 hrs, Volume= 11.758 af
Outflow = 6.80 cfs @ 14.56 hrs, Volume= 11.670 af, Atten= 96%, Lag= 139.3 min
Primary = 6.80 cfs @ 14.56 hrs, Volume= 11.670 af
Routed to Link 1L : NW Offsite
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 1P : Pond 2

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Starting Elev= 955.00' Surf.Area= 2.026 ac Storage= 3.994 af
Peak Elev= 957.78' @ 14.56 hrs Surf.Area= 4.033 ac Storage= 12.529 af (8.534 af above start)

Plug-Flow detention time= 1,674.1 min calculated for 7.675 af (65% of inflow)
Center-of-Mass det. time= 1,113.0 min (1,904.5 - 791.5)

Volume	Invert	Avail.Storage	Storage Description
#1	951.00'	56.527 af	**Storage Pond 1 (Prismatic)**Listed below (Recalc)
#2	954.24'	33.838 af	**Existing Wetland (Prismatic)**Listed below (Recalc)
		90.365 af	Total Available Storage

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
951.00	0.651	0.000	0.000
952.00	0.762	0.706	0.706
953.00	0.905	0.834	1.540
954.00	1.056	0.981	2.520
955.00	1.462	1.259	3.779
956.00	1.622	1.542	5.321
957.00	1.983	1.802	7.124
958.00	2.144	2.063	9.187
959.00	2.298	2.221	11.408
960.00	3.049	2.673	14.082
961.00	3.526	3.287	17.369
962.00	3.932	3.729	21.098
963.00	4.259	4.096	25.194
964.00	4.758	4.509	29.702
965.00	5.063	4.910	34.613
966.00	5.280	5.171	39.784
967.00	5.468	5.374	45.158
968.00	5.704	5.586	50.744
969.00	5.862	5.783	56.527

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
954.24	0.001	0.000	0.000
955.00	0.564	0.215	0.215
956.00	1.102	0.833	1.048
957.00	1.623	1.362	2.410
958.00	2.006	1.814	4.225
959.00	2.334	2.170	6.395
960.00	2.587	2.461	8.855
961.00	2.759	2.673	11.528
962.00	2.912	2.835	14.364
963.00	3.024	2.968	17.332
964.00	3.169	3.097	20.428
965.00	3.290	3.230	23.658
966.00	3.383	3.336	26.994
967.00	3.434	3.409	30.403
968.00	3.436	3.435	33.838

Device	Routing	Invert	Outlet Devices
#1	Primary	955.00'	**24.0" Round Culvert** L= 100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 955.00' / 954.00' S= 0.0100 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf
#2	Device 1	955.00'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	957.50'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.5' Crest Height
#4	Device 1	957.75'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	959.00'	**80.0' long + 3.0 '/' SideZ x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=6.80 cfs @ 14.56 hrs HW=957.78' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 6.80 cfs of 20.20 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 4.04 cfs @ 7.41 fps)
  ├─**3=Sharp-Crested Rectangular Weir** (Weir Controls 2.50 cfs @ 1.78 fps)
  └─**4=Orifice/Grate** (Weir Controls 0.26 cfs @ 0.60 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=955.00' TW=954.00' (Dynamic Tailwater)
└─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 8P: Wetland

Inflow = 60.54 cfs @ 12.47 hrs, Volume= 5.987 af
Outflow = 52.91 cfs @ 12.60 hrs, Volume= 5.737 af, Atten= 13%, Lag= 7.9 min
Primary = 52.91 cfs @ 12.60 hrs, Volume= 5.737 af
Routed to Pond 10P : Offsite Detention Pond

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Peak Elev= 961.99' @ 12.60 hrs Surf.Area= 1.064 ac Storage= 0.996 af

Plug-Flow detention time= 44.9 min calculated for 5.737 af (96% of inflow)
Center-of-Mass det. time= 23.2 min (852.0 - 828.9)

Volume	Invert	Avail.Storage	Storage Description
#1	959.40'	277.352 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
959.40	0.001	0.000	0.000
960.00	0.036	0.011	0.011
961.00	0.442	0.239	0.250
962.00	1.069	0.756	1.006
963.00	1.995	1.532	2.538
964.00	3.064	2.529	5.067
965.00	3.946	3.505	8.572
966.00	4.780	4.363	12.935
967.00	5.386	5.083	18.018
968.00	6.227	5.807	23.825
969.00	7.123	6.675	30.500
970.00	7.839	7.481	37.981
971.00	8.515	8.177	46.158
972.00	9.161	8.838	54.996
973.00	9.761	9.461	64.457
974.00	10.195	9.978	74.435
975.00	10.550	10.372	84.807
976.00	10.935	10.742	95.550
977.00	11.677	11.306	106.856
978.00	12.346	12.011	118.867
979.00	12.873	12.610	131.477
980.00	13.314	13.093	144.570
981.00	13.733	13.523	158.094
982.00	14.085	13.909	172.003
983.00	14.393	14.239	186.242
984.00	14.655	14.524	200.766
985.00	14.910	14.782	215.548
986.00	15.180	15.045	230.593
987.00	15.475	15.327	245.921
988.00	15.714	15.594	261.515
989.00	15.960	15.837	277.352

Device	Routing	Invert	Outlet Devices
#1	Primary	961.00'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=52.90 cfs @ 12.60 hrs HW=961.99' TW=959.55' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 52.90 cfs @ 2.67 fps)

Summary for Pond 10P: Offsite Detention Pond

Inflow = 90.30 cfs @ 12.30 hrs, Volume= 10.891 af
Outflow = 3.98 cfs @ 16.08 hrs, Volume= 10.770 af, Atten= 96%, Lag= 226.8 min
Primary = 3.98 cfs @ 16.08 hrs, Volume= 10.770 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 8P : Wetland
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 3P : Pond 1

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Starting Elev= 957.86' Surf.Area= 2.119 ac Storage= 0.916 af
Peak Elev= 960.78' @ 16.08 hrs Surf.Area= 3.124 ac Storage= 9.008 af (8.092 af above start)

Plug-Flow detention time= 1,309.2 min calculated for 9.854 af (90% of inflow)
Center-of-Mass det. time= 1,158.4 min (1,978.4 - 820.0)

Volume	Invert	Avail.Storage	Storage Description
#1	956.84'	629.602 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
956.84	0.001	0.000	0.000
957.00	0.009	0.001	0.001
958.00	2.462	1.235	1.236
959.00	2.703	2.582	3.819
960.00	2.939	2.821	6.640
961.00	3.176	3.058	9.697
962.00	3.494	3.335	13.032
963.00	3.812	3.653	16.685
964.00	4.246	4.029	20.714
965.00	4.959	4.603	25.317
966.00	6.092	5.526	30.842
967.00	6.980	6.536	37.378
968.00	7.556	7.268	44.646
969.00	7.997	7.776	52.423
970.00	8.442	8.220	60.642
971.00	9.175	8.808	69.451
972.00	10.268	9.722	79.172
973.00	12.244	11.256	90.428
974.00	13.280	12.762	103.190
975.00	14.394	13.837	117.027
976.00	15.690	15.042	132.069
977.00	16.919	16.304	148.374
978.00	17.912	17.415	165.789
979.00	18.694	18.303	184.092
980.00	19.301	18.998	203.090
981.00	19.872	19.586	222.676
982.00	20.405	20.139	242.815
983.00	20.744	20.574	263.389
984.00	20.863	20.803	284.193
985.00	20.959	20.911	305.104
986.00	21.049	21.004	326.108
987.00	21.179	21.114	347.222
988.00	21.273	21.226	368.448
989.00	21.334	21.303	389.751
990.00	21.409	21.372	411.123
991.00	21.502	21.456	432.578
992.00	21.597	21.549	454.128
993.00	21.734	21.665	475.793
994.00	21.789	21.761	497.555
995.00	21.842	21.815	519.370
996.00	21.920	21.881	541.251
997.00	21.983	21.951	563.203
998.00	22.065	22.024	585.227
999.00	22.198	22.131	607.358
1,000.00	22.290	22.244	629.602

Device	Routing	Invert	Outlet Devices
#1	Primary	957.86'	**12.0" Round RCP_Round 12"** L= 348.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 957.86' / 956.07' S= 0.0051 '/' Cc= 0.900

			n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Secondary	961.00'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Tertiary	963.00'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3.98 cfs @ 16.08 hrs HW=960.78' (Free Discharge)
1=RCP_Round 12" (Barrel Controls 3.98 cfs @ 5.06 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=957.86' TW=959.40' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=957.86' TW=955.00' (Dynamic Tailwater)
3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link 1L: NW Offsite

Inflow	=	10.50 cfs @	14.16 hrs,	Volume=	14.804 af
Primary	=	10.50 cfs @	14.17 hrs,	Volume=	14.804 af, Atten= 0%, Lag= 0.6 min

Primary outflow = Inflow, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs

Summary for Link 10L: SE Offsite

Inflow Area = 2.111 ac, 0.00% Impervious, Inflow Depth = 2.22" for 10 yr event
Inflow = 7.48 cfs @ 12.17 hrs, Volume= 0.391 af
Primary = 7.48 cfs @ 12.18 hrs, Volume= 0.391 af, Atten= 0%, Lag= 0.6 min

Primary outflow = Inflow, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs

Time span=0.00-192.00 hrs, dt=0.01 hrs, 19201 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Sim-Route method - Pond routing by Sim-Route method

SubcatchmentA: A Runoff Area=2.111 ac 0.00% Impervious Runoff Depth=4.57"
Flow Length=271' Tc=9.5 min CN=80/0 Runoff=15.09 cfs 0.805 af

SubcatchmentB: B Runoff Area=0.307 ac 2.62% Impervious Runoff Depth=4.63"
Tc=8.0 min CN=80/98 Runoff=2.35 cfs 0.118 af

SubcatchmentC: C Runoff Area=17.688 ac 41.28% Impervious Runoff Depth=5.11"
Flow Length=1,471' Tc=18.0 min CN=75/98 Runoff=99.41 cfs 7.527 af

SubcatchmentD: D Runoff Area=5.091 ac 39.95% Impervious Runoff Depth=5.07"
Flow Length=805' Tc=12.5 min CN=75/98 Runoff=33.65 cfs 2.152 af

SubcatchmentE: E Runoff Area=35.243 ac 6.26% Impervious Runoff Depth=4.30"
Flow Length=1,898' Tc=32.0 min CN=76/98 Runoff=128.93 cfs 12.621 af

SubcatchmentF: F Runoff Area=50.683 ac 28.26% Impervious Runoff Depth=5.00"
Flow Length=2,411' Tc=15.8 min CN=78/98 Runoff=302.57 cfs 21.117 af

SubcatchmentG: G Runoff Area=14.234 ac 29.14% Impervious Runoff Depth=4.94"
Flow Length=1,340' Tc=26.0 min CN=77/98 Runoff=64.96 cfs 5.863 af

SubcatchmentG2: G2 Runoff Area=0.182 ac 41.47% Impervious Runoff Depth=5.36"
Tc=8.0 min CN=79/98 Runoff=1.51 cfs 0.081 af

SubcatchmentH: H Runoff Area=3.437 ac 28.72% Impervious Runoff Depth=5.01"
Flow Length=567' Tc=17.2 min CN=78/98 Runoff=19.74 cfs 1.435 af

SubcatchmentJ: J Runoff Area=0.042 ac 42.43% Impervious Runoff Depth=5.08"
Tc=8.0 min CN=74/98 Runoff=0.33 cfs 0.018 af

Pond 1P: Pond 2 Peak Elev=956.46' Storage=7.834 af Inflow=64.96 cfs 6.355 af
Primary=18.29 cfs 6.331 af Secondary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=18.29 cfs 6.331 af

Pond 3P: Pond 1 Peak Elev=959.12' Storage=18.355 af Inflow=322.12 cfs 22.552 af
Primary=26.71 cfs 21.970 af Secondary=7.57 cfs 0.492 af Outflow=34.28 cfs 22.462 af

Pond 8P: Wetland Peak Elev=962.97' Storage=2.485 af Inflow=128.93 cfs 21.770 af
Outflow=108.60 cfs 21.520 af

Pond 10P: Offsite Detention Pond Peak Elev=962.97' Storage=16.561 af Inflow=182.09 cfs 31.199 af
Primary=5.01 cfs 21.905 af Secondary=18.00 cfs 9.149 af Tertiary=0.00 cfs 0.000 af Outflow=23.00 cfs 31.054 af

Link 1L: NW Offsite Inflow=45.29 cfs 28.519 af
Primary=45.29 cfs 28.519 af

Link 10L: SE Offsite Inflow=15.09 cfs 0.805 af
Primary=15.09 cfs 0.805 af

Total Runoff Area = 129.018 ac Runoff Volume = 51.738 af Average Runoff Depth = 4.81"
75.90% Pervious = 97.919 ac 24.10% Impervious = 31.099 ac

Summary for Subcatchment A: A

Runoff = 15.09 cfs @ 12.17 hrs, Volume= 0.805 af, Depth= 4.57"
Routed to Link 10L : SE Offsite

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 100 yr Rainfall=6.87"

Area (ac)	CN	Description
0.030	74	>75% Grass cover, Good, HSG C
2.081	80	Row crops, SR + CR, Good, HSG C
2.111	80	Weighted Average
2.111	80	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0483	0.21		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.81"
1.4	171	0.0909	2.11		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.5	271	Total			

Summary for Subcatchment B: B

Runoff = 2.35 cfs @ 12.15 hrs, Volume= 0.118 af, Depth= 4.63"
Routed to Link 1L : NW Offsite

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 100 yr Rainfall=6.87"

Area (ac)	CN	Description
0.103	74	>75% Grass cover, Good, HSG C
0.076	80	>75% Grass cover, Good, HSG D
0.067	77	2 acre lots, 12% imp, HSG C
0.037	98	Unconnected pavement, HSG C
0.021	98	Unconnected pavement, HSG D
0.003	98	Unconnected pavement, HSG D
0.307	81	Weighted Average
0.299	80	97.38% Pervious Area
0.008	98	2.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Summary for Subcatchment C: C

[47] Hint: Peak is 1595% of capacity of segment #3

Runoff = 99.41 cfs @ 12.26 hrs, Volume= 7.527 af, Depth= 5.11"
Routed to Pond 10P : Offsite Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 100 yr Rainfall=6.87"

Area (ac)	CN	Description
0.210	74	>75% Grass cover, Good, HSG C
0.125	80	>75% Grass cover, Good, HSG D
0.064	75	1/4 acre lots, 38% imp, HSG B
13.191	83	1/4 acre lots, 38% imp, HSG C
0.978	87	1/4 acre lots, 38% imp, HSG D
0.591	79	Pasture/grassland/range, Fair, HSG C
0.440	84	Pasture/grassland/range, Fair, HSG D
1.185	98	Water Surface, HSG C
0.705	98	Water Surface, HSG D
0.161	60	Woods, Fair, HSG B
0.002	98	Paved parking, HSG C
0.001	98	Paved parking, HSG D
0.026	98	Unconnected pavement, HSG C
0.009	98	Unconnected pavement, HSG D
17.688	84	Weighted Average
10.386	75	58.72% Pervious Area
7.302	98	41.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.3	100	0.2618	0.12		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.81"
2.4	760	0.0653	5.19		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.3	611	0.0219	7.93	6.23	**Pipe Channel, RCP_Round 12"** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011 Concrete pipe, straight & clean
18.0	1,471	Total			

Summary for Subcatchment D: D

Runoff = 33.65 cfs @ 12.20 hrs, Volume= 2.152 af, Depth= 5.07"
Routed to Pond 10P : Offsite Detention Pond

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 100 yr Rainfall=6.87"

Area (ac)	CN	Description
0.005	74	>75% Grass cover, Good, HSG C
0.017	80	>75% Grass cover, Good, HSG D
4.198	83	1/4 acre lots, 38% imp, HSG C
0.151	87	1/4 acre lots, 38% imp, HSG D
0.044	79	Pasture/grassland/range, Fair, HSG C
0.277	84	Pasture/grassland/range, Fair, HSG D
0.035	98	Water Surface, HSG C
0.345	98	Water Surface, HSG D
0.001	98	Paved parking, HSG C
0.002	98	Unconnected pavement, HSG C
0.016	98	Unconnected pavement, HSG D
5.091	84	Weighted Average
3.057	75	60.05% Pervious Area
2.034	98	39.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	45	0.0072	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.81"
3.7	575	0.0161	2.58		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	185		6.00		**Direct Entry,**
12.5	805	Total			

Summary for Subcatchment E: E

Runoff = 128.93 cfs @ 12.45 hrs, Volume= 12.621 af, Depth= 4.30"
Routed to Pond 8P : Wetland

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 100 yr Rainfall=6.87"

Area (ac)	CN	Description
2.292	74	>75% Grass cover, Good, HSG C
0.327	80	>75% Grass cover, Good, HSG D
0.811	79	1 acre lots, 20% imp, HSG C
1.643	83	1/4 acre lots, 38% imp, HSG C
0.534	87	1/4 acre lots, 38% imp, HSG D
4.895	79	Pasture/grassland/range, Fair, HSG C
2.741	84	Pasture/grassland/range, Fair, HSG D
10.320	80	Row crops, SR + CR, Good, HSG C
1.192	98	Water Surface, HSG D
4.308	60	Woods, Fair, HSG B
5.641	73	Woods, Fair, HSG C
0.021	98	Paved parking, HSG C
0.002	98	Paved parking, HSG D
0.420	98	Unconnected pavement, HSG C
0.096	98	Unconnected pavement, HSG D
35.243	77	Weighted Average
33.039	76	93.74% Pervious Area
2.204	98	6.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.0615	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
22.3	1,798	0.0369	1.34		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
32.0	1,898	Total			

Summary for Subcatchment F: F

Runoff = 302.57 cfs @ 12.24 hrs, Volume= 21.117 af, Depth= 5.00"
Routed to Pond 3P : Pond 1

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 100 yr Rainfall=6.87"

	Area (ac)	CN	Description
*	21.187	74	>75% Grass cover, Good, HSG C
*	5.076	80	>75% Grass cover, Good, HSG D
*	1.881	83	1/4 acre lots, 38% imp, HSG C
*	0.116	87	1/4 acre lots, 38% imp, HSG D
*	1.400	79	Pasture/grassland/range, Fair, HSG C
*	1.191	84	Pasture/grassland/range, Fair, HSG D
*	10.114	98	Paved parking, HSG C
*	1.987	98	Paved parking, HSG D
*	2.944	80	Row crops, SR + CR, Good, HSG C
*	0.239	84	Row crops, SR + CR, Good, HSG D
*	2.471	98	Unconnected pavement, HSG C
*	0.613	98	Unconnected pavement, HSG D
*	1.067	98	Water Surface, HSG C
*	0.397	98	Water Surface, HSG D
	50.683	84	Weighted Average
	36.359	78	71.74% Pervious Area
	14.324	98	28.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.8	50	0.0099	0.09		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.81"
1.0	200	0.0287	3.44		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
6.0	2,161		6.00		**Direct Entry,**
15.8	2,411	Total			

Summary for Subcatchment G: G

Runoff = 64.96 cfs @ 12.37 hrs, Volume= 5.863 af, Depth= 4.94"
Routed to Pond 1P : Pond 2

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 100 yr Rainfall=6.87"

Area (ac)	CN	Description
4.301	74	>75% Grass cover, Good, HSG C
1.157	80	>75% Grass cover, Good, HSG D
2.305	79	1 acre lots, 20% imp, HSG C
0.144	84	1 acre lots, 20% imp, HSG D
1.384	77	2 acre lots, 12% imp, HSG C
0.606	82	2 acre lots, 12% imp, HSG D
0.354	98	Unconnected pavement, HSG C
0.663	98	Water Surface, HSG C
0.562	98	Water Surface, HSG D
1.952	98	Paved parking, HSG C
0.242	98	Paved parking, HSG D
0.423	98	Unconnected pavement, HSG C
0.141	98	Unconnected pavement, HSG D
14.234	83	Weighted Average
10.086	77	70.86% Pervious Area
4.148	98	29.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.7	100	0.0159	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.81"
6.9	370	0.0165	0.90		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.4	870		6.00		**Direct Entry,**
26.0	1,340	Total			

Summary for Subcatchment G2: G2

Runoff = 1.51 cfs @ 12.15 hrs, Volume= 0.081 af, Depth= 5.36"
Routed to Link 1L : NW Offsite

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 100 yr Rainfall=6.87"

Area (ac)	CN	Description
0.025	74	>75% Grass cover, Good, HSG C
0.096	83	1/4 acre lots, 38% imp, HSG C
0.039	98	Paved parking, HSG C
0.022	98	Unconnected pavement, HSG C
0.182	87	Weighted Average
0.107	79	58.53% Pervious Area
0.075	98	41.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Summary for Subcatchment H: H

Runoff = 19.74 cfs @ 12.25 hrs, Volume= 1.435 af, Depth= 5.01"
Routed to Pond 3P : Pond 1

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 100 yr Rainfall=6.87"

Area (ac)	CN	Description
1.536	74	>75% Grass cover, Good, HSG C
0.725	80	>75% Grass cover, Good, HSG D
0.101	98	Water Surface, HSG C
0.881	98	Water Surface, HSG D
0.005	98	Paved parking, HSG C
0.184	98	Unconnected pavement, HSG C
0.005	98	Unconnected pavement, HSG D
3.437	83	Weighted Average
2.450	78	71.28% Pervious Area
0.987	98	28.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.0255	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.81"
7.7	467	0.0211	1.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
17.2	567	Total			

Summary for Subcatchment J: J

Runoff = 0.33 cfs @ 12.15 hrs, Volume= 0.018 af, Depth= 5.08"
Routed to Link 1L : NW Offsite

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-192.00 hrs, dt= 0.0
MSE 24-hr 3 100 yr Rainfall=6.87"

Area (ac)	CN	Description
0.039	83	1/4 acre lots, 38% imp, HSG C
0.003	98	Paved parking, HSG C
0.042	84	Weighted Average
0.024	74	57.57% Pervious Area
0.018	98	42.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Summary for Pond 1P: Pond 2

Inflow = 64.96 cfs @ 12.37 hrs, Volume= 6.355 af
Outflow = 18.29 cfs @ 13.20 hrs, Volume= 6.331 af, Atten= 72%, Lag= 49.8 min
Primary = 18.29 cfs @ 13.20 hrs, Volume= 6.331 af
Routed to Link 1L : NW Offsite
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 1L : NW Offsite
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 3P : Pond 1

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Starting Elev= 954.00' Surf.Area= 1.225 ac Storage= 4.523 af
Peak Elev= 956.46' @ 13.20 hrs Surf.Area= 1.538 ac Storage= 7.834 af (3.311 af above start)

Plug-Flow detention time= 1,089.3 min calculated for 1.808 af (28% of inflow)
Center-of-Mass det. time= 342.2 min (1,135.1 - 792.9)

Volume	Invert	Avail.Storage	Storage Description
#1	949.00'	25.363 af	**Pond 2 (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
949.00	0.697	0.000	0.000
950.00	0.768	0.732	0.732
951.00	0.852	0.810	1.543
952.00	0.932	0.892	2.435
953.00	1.010	0.971	3.406
954.00	1.225	1.118	4.523
955.00	1.312	1.268	5.791
956.00	1.410	1.361	7.153
957.00	1.686	1.548	8.701
958.00	2.261	1.974	10.674
959.00	2.855	2.558	13.232
960.00	3.020	2.937	16.170
961.00	3.052	3.036	19.206
962.00	3.084	3.068	22.274
963.00	3.095	3.089	25.363

Device	Routing	Invert	Outlet Devices
#1	Primary	954.00'	**24.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 1	954.00'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	955.75'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 1	956.00'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	956.50'	**12.5' long + 4.0 '/' SideZ x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#6	Secondary	958.75'	**100.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

#7 Tertiary 959.00' **90.0' long + 3.0 '/' SideZ x 5.0' breadth Broad-Crested Rectangular Weir**
Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
2.50 3.00 3.50 4.00 4.50 5.00 5.50
Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65
2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=18.29 cfs @ 13.20 hrs HW=956.46' TW=0.00' (Dynamic Tailwater)
└─**1=Orifice/Grate** (Orifice Controls 18.29 cfs @ 5.82 fps)
  ├─**2=Orifice/Grate** (Passes < 5.30 cfs potential flow)
  ├─**3=Sharp-Crested Rectangular Weir** (Passes < 9.55 cfs potential flow)
  └─**4=Orifice/Grate** (Passes < 12.92 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=954.00' TW=0.00' (Dynamic Tailwater)
├─**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=954.00' TW=955.00' (Dynamic Tailwater)
└─**7=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 3P: Pond 1

Inflow = 322.12 cfs @ 12.24 hrs, Volume= 22.552 af
Outflow = 34.28 cfs @ 13.13 hrs, Volume= 22.462 af, Atten= 89%, Lag= 53.7 min
Primary = 26.71 cfs @ 13.13 hrs, Volume= 21.970 af
Routed to Link 1L : NW Offsite
Secondary = 7.57 cfs @ 13.13 hrs, Volume= 0.492 af
Routed to Pond 1P : Pond 2

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Starting Elev= 955.00' Surf.Area= 2.026 ac Storage= 3.994 af
Peak Elev= 959.12' @ 13.13 hrs Surf.Area= 4.750 ac Storage= 18.355 af (14.360 af above start)

Plug-Flow detention time= 918.0 min calculated for 18.467 af (82% of inflow)
Center-of-Mass det. time= 704.0 min (1,487.2 - 783.2)

Volume	Invert	Avail.Storage	Storage Description
#1	951.00'	56.527 af	**Storage Pond 1 (Prismatic)** Listed below (Recalc)
#2	954.24'	33.838 af	**Existing Wetland (Prismatic)** Listed below (Recalc)
		90.365 af	Total Available Storage

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
951.00	0.651	0.000	0.000
952.00	0.762	0.706	0.706
953.00	0.905	0.834	1.540
954.00	1.056	0.981	2.520
955.00	1.462	1.259	3.779
956.00	1.622	1.542	5.321
957.00	1.983	1.802	7.124
958.00	2.144	2.063	9.187
959.00	2.298	2.221	11.408
960.00	3.049	2.673	14.082
961.00	3.526	3.287	17.369
962.00	3.932	3.729	21.098
963.00	4.259	4.096	25.194
964.00	4.758	4.509	29.702
965.00	5.063	4.910	34.613
966.00	5.280	5.171	39.784
967.00	5.468	5.374	45.158
968.00	5.704	5.586	50.744
969.00	5.862	5.783	56.527

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
954.24	0.001	0.000	0.000
955.00	0.564	0.215	0.215
956.00	1.102	0.833	1.048
957.00	1.623	1.362	2.410
958.00	2.006	1.814	4.225
959.00	2.334	2.170	6.395
960.00	2.587	2.461	8.855
961.00	2.759	2.673	11.528
962.00	2.912	2.835	14.364
963.00	3.024	2.968	17.332
964.00	3.169	3.097	20.428
965.00	3.290	3.230	23.658
966.00	3.383	3.336	26.994
967.00	3.434	3.409	30.403
968.00	3.436	3.435	33.838

Device	Routing	Invert	Outlet Devices
#1	Primary	955.00'	**24.0" Round Culvert** L= 100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 955.00' / 954.00' S= 0.0100 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf
#2	Device 1	955.00'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	957.50'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.5' Crest Height
#4	Device 1	957.75'	**48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	959.00'	**80.0' long + 3.0 '/' SideZ x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=26.71 cfs @ 13.13 hrs HW=959.12' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Inlet Controls 26.71 cfs @ 8.50 fps)
  - **2=Orifice/Grate** (Passes < 5.05 cfs potential flow)
  - **3=Sharp-Crested Rectangular Weir** (Passes < 35.61 cfs potential flow)
  - **4=Orifice/Grate** (Passes < 65.72 cfs potential flow)

Secondary OutFlow Max=7.57 cfs @ 13.13 hrs HW=959.12' TW=956.46' (Dynamic Tailwater)
- **5=Broad-Crested Rectangular Weir** (Weir Controls 7.57 cfs @ 0.80 fps)

Summary for Pond 8P: Wetland

[86] Warning: Oscillations may require smaller dt (severity=279)

Inflow = 128.93 cfs @ 12.45 hrs, Volume= 21.770 af
Outflow = 108.60 cfs @ 12.57 hrs, Volume= 21.520 af, Atten= 16%, Lag= 7.6 min
Primary = 108.60 cfs @ 12.57 hrs, Volume= 21.520 af
Routed to Pond 10P : Offsite Detention Pond

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Peak Elev= 962.97' @ 18.68 hrs Surf.Area= 1.971 ac Storage= 2.485 af

Plug-Flow detention time= 133.8 min calculated for 21.519 af (99% of inflow)
Center-of-Mass det. time= 122.9 min (1,149.7 - 1,026.8)

Volume	Invert	Avail.Storage	Storage Description
#1	959.40'	277.352 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
959.40	0.001	0.000	0.000
960.00	0.036	0.011	0.011
961.00	0.442	0.239	0.250
962.00	1.069	0.756	1.006
963.00	1.995	1.532	2.538
964.00	3.064	2.529	5.067
965.00	3.946	3.505	8.572
966.00	4.780	4.363	12.935
967.00	5.386	5.083	18.018
968.00	6.227	5.807	23.825
969.00	7.123	6.675	30.500
970.00	7.839	7.481	37.981
971.00	8.515	8.177	46.158
972.00	9.161	8.838	54.996
973.00	9.761	9.461	64.457
974.00	10.195	9.978	74.435
975.00	10.550	10.372	84.807
976.00	10.935	10.742	95.550
977.00	11.677	11.306	106.856
978.00	12.346	12.011	118.867
979.00	12.873	12.610	131.477
980.00	13.314	13.093	144.570
981.00	13.733	13.523	158.094
982.00	14.085	13.909	172.003
983.00	14.393	14.239	186.242
984.00	14.655	14.524	200.766
985.00	14.910	14.782	215.548
986.00	15.180	15.045	230.593
987.00	15.475	15.327	245.921
988.00	15.714	15.594	261.515
989.00	15.960	15.837	277.352

Device	Routing	Invert	Outlet Devices
#1	Primary	961.00'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=108.15 cfs @ 12.57 hrs HW=962.62' TW=961.15' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 108.15 cfs @ 3.34 fps)

Summary for Pond 10P: Offsite Detention Pond

Inflow = 182.09 cfs @ 12.29 hrs, Volume= 31.199 af
Outflow = 23.00 cfs @ 17.03 hrs, Volume= 31.054 af, Atten= 87%, Lag= 284.2 min
Primary = 5.01 cfs @ 18.70 hrs, Volume= 21.905 af
Secondary = 18.00 cfs @ 17.03 hrs, Volume= 9.149 af
Routed to Pond 8P : Wetland
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 3P : Pond 1

Routing by Sim-Route method, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs
Starting Elev= 957.86' Surf.Area= 2.119 ac Storage= 0.916 af
Peak Elev= 962.97' @ 18.70 hrs Surf.Area= 3.802 ac Storage= 16.561 af (15.645 af above start)

Plug-Flow detention time= 1,237.6 min calculated for 30.137 af (97% of inflow)
Center-of-Mass det. time= 1,151.1 min (2,185.5 - 1,034.4)

Volume	Invert	Avail.Storage	Storage Description
#1	956.84'	629.602 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
956.84	0.001	0.000	0.000
957.00	0.009	0.001	0.001
958.00	2.462	1.235	1.236
959.00	2.703	2.582	3.819
960.00	2.939	2.821	6.640
961.00	3.176	3.058	9.697
962.00	3.494	3.335	13.032
963.00	3.812	3.653	16.685
964.00	4.246	4.029	20.714
965.00	4.959	4.603	25.317
966.00	6.092	5.526	30.842
967.00	6.980	6.536	37.378
968.00	7.556	7.268	44.646
969.00	7.997	7.776	52.423
970.00	8.442	8.220	60.642
971.00	9.175	8.808	69.451
972.00	10.268	9.722	79.172
973.00	12.244	11.256	90.428
974.00	13.280	12.762	103.190
975.00	14.394	13.837	117.027
976.00	15.690	15.042	132.069
977.00	16.919	16.304	148.374
978.00	17.912	17.415	165.789
979.00	18.694	18.303	184.092
980.00	19.301	18.998	203.090
981.00	19.872	19.586	222.676
982.00	20.405	20.139	242.815
983.00	20.744	20.574	263.389
984.00	20.863	20.803	284.193
985.00	20.959	20.911	305.104
986.00	21.049	21.004	326.108
987.00	21.179	21.114	347.222
988.00	21.273	21.226	368.448
989.00	21.334	21.303	389.751
990.00	21.409	21.372	411.123
991.00	21.502	21.456	432.578
992.00	21.597	21.549	454.128
993.00	21.734	21.665	475.793
994.00	21.789	21.761	497.555
995.00	21.842	21.815	519.370
996.00	21.920	21.881	541.251
997.00	21.983	21.951	563.203
998.00	22.065	22.024	585.227
999.00	22.198	22.131	607.358
1,000.00	22.290	22.244	629.602

Device	Routing	Invert	Outlet Devices
#1	Primary	957.86'	**12.0" Round RCP_Round 12"** L= 348.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 957.86' / 956.07' S= 0.0051 '/' Cc= 0.900

			n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Secondary	961.00'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Tertiary	963.00'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=5.01 cfs @ 18.70 hrs HW=962.97' (Free Discharge)
└**1=RCP_Round 12"** (Barrel Controls 5.01 cfs @ 6.38 fps)

Secondary OutFlow Max=8.95 cfs @ 17.03 hrs HW=962.95' TW=962.95' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 8.95 cfs @ 0.23 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=957.86' TW=955.00' (Dynamic Tailwater)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 1L: NW Offsite

Inflow = 45.29 cfs @ 13.15 hrs, Volume= 28.519 af
Primary = 45.29 cfs @ 13.16 hrs, Volume= 28.519 af, Atten= 0%, Lag= 0.6 min

Primary outflow = Inflow, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs

Summary for Link 10L: SE Offsite

Inflow Area = 2.111 ac, 0.00% Impervious, Inflow Depth = 4.57" for 100 yr event
Inflow = 15.09 cfs @ 12.17 hrs, Volume= 0.805 af
Primary = 15.09 cfs @ 12.18 hrs, Volume= 0.805 af, Atten= 0%, Lag= 0.6 min

Primary outflow = Inflow, Time Span= 0.00-192.00 hrs, dt= 0.01 hrs

Appendix C

Proposed Pond Design & Runoff Rates

Bogart, Pederson & Associates, Inc.
CIVIL ENGINEERING
LAND SURVEYING
ENVIRONMENTAL SERVICES
Traditional Values • Creative Solutions

Project Name	Monticello Nelson		
Project Location	Monticello, MN	Prepared By:	DFB
BPA Project Number	21-0300.00	Checked By:	CJD
		Page	1 of 1

Monticello Nelson - Stormwater Calculations

Proposed Drainage Ponds:

Proposed Pond 1

Water Quality Volume Required*	1.5" x	678,801.00	s.f.	=	84,850	c.f
Water Quality Volume Provided	Provided Between 955 & 956.5				104,500	c.f.
Max Water Quality Release Rate	5.66 cfs/Ac of pond Surface area **			=	10.20	cfs
Water Quality Release Rate Provided at Required Water quality Volume	Per HydroCAD Report at 956.5			=	1.06	cfs
Permanent Pool Volume Required***	1800 cf/Ac x	54.12	Ac	=	97,414	c.f.
Permanent Pool Volume Provided	Between 951 & 955				164,613	c.f.

*1.5" x Total New Impervious Area
**Acrage of Pond Surface Area at Height of Water Quality Release Rate
***1800 cf/Ac x Area Draining to pond

Proposed Pond 2

Water Quality Volume Required*	1.5" x	135,515.16	s.f.	=	16,939	c.f
Water Quality Volume Provided	Provided Between 954 & 956				146,754	c.f.
Max Water Quality Release Rate	5.66 cfs/Ac of pond Surface area **			=	6.93	cfs
Water Quality Release Rate Provided at Required Water quality Volume	Per HydroCAD Report at 956			=	1.25	cfs
Permanent Pool Volume Required***	1800 cf/Ac x	14.23	Ac	=	25,619	c.f.
Permanent Pool Volume Provided	Between 949 & 954				197,022	c.f.

*1.1" x Total New Impervious Area
**Acrage of Pond Surface Area at Height of Water Quality Release Rate
***1800 cf/Ac x Area Draining to pond

Pond 1 Drainage Area

Land Type		
Total Drainage Area	2,357,424	Total SF
Proposed New Impervious Area	678,801	Total SF
Pervious Area	1,678,623	*Total SF*
Total Drainage Area	54.12	Area (Acres)

Pond 2 Drainage Area

Land Type		
Total Drainage Area	619,989	Total SF
Proposed New Impervious Area	135,515	Total SF
Pervious Area	484,474	*Total SF*
Total Drainage Area	14.23	Area (Acres)

Existing Drainage:

Northwest - Offsite

Rainfall Event	*Flow (cfs)*	Peak Elevation
2 Year	6.23	NA
10 Year	37.21	NA
100 Year	90.61	NA
10-Day Snowmelt	NA	NA

Offsite Existing Detention Pond

Rainfall Event	*Flow (cfs)*	Peak Elevation
2 Year	3.50	959.99
10 Year	4.52	961.87
100 Year	5.34	963.80
10-Day Snowmelt	NA	961.89

Southeast - Offsite

Rainfall Event	*Flow (cfs)*	Peak Elevation
2 Year	4.44	NA
10 Year	8.44	NA
100 Year	16.51	NA
10-Day Snowmelt	NA	NA

Proposed Drainage:

Northwest - Offsite

Rainfall Event	*Flow (cfs)*	Peak Elevation
2 Year	5.28	NA
10 Year	10.50	NA
100 Year	45.29	NA
10-Day Snowmelt	NA	NA

Offsite Existing Detention Pond

Rainfall Event	*Flow (cfs)*	Peak Elevation
2 Year	3.17	959.36
10 Year	3.98	960.78
100 Year	5.01	962.97
10-Day Snowmelt	NA	959.76

Southeast - Offsite

Rainfall Event	*Flow (cfs)*	Peak Elevation
2 Year	3.78	NA
10 Year	7.48	NA
100 Year	15.09	NA
10-Day Snowmelt	NA	NA

Existing vs. Proposed Runoff Rates:

Northwest - Offsite

Rainfall Event	*Flow (cfs)*	Peak Elevation
2 Year	0.95	NA
10 Year	26.71	NA
100 Year	45.32	NA
10-Day Snowmelt	NA	NA

Offsite Existing Detention Pond

Rainfall Event	*Flow (cfs)*	Peak Elevation
2 Year	0.33	0.63
10 Year	0.54	1.09
100 Year	0.33	0.83
10-Day Snowmelt	NA	2.13

Southeast - Offsite

Rainfall Event	*Flow (cfs)*	Peak Elevation
2 Year	0.66	NA
10 Year	0.96	NA
100 Year	1.42	NA
10-Day Snowmelt	NA	NA

Total Permanent Pool Volume Provided:

Required =	123,034	cf
Provided =	*361,635*	cf

*Rates Are Proposed Runoff Rate - Existing Runoff Rate

Total Water Quality Treatment Volume Provided:

Required =	101,790	cf
Provided =	*251,254*	cf

*1.1" x New Total Site Impervious Area

Bogart, Pederson & Associates, Inc.
CIVIL ENGINEERING
LAND SURVEYING
ENVIRONMENTAL SERVICES
Traditional Values • Creative Solutions

DESIGNED BY: CJN **CHECKED BY:** DFB
File: **21-0300**

RATIONAL METHOD DESIGN
RETURN PERIOD: 10 **year** **n=** 0.013 RCP

PROJECT NAME: Tamarack Nelson
Monticello, MN

STRUCTURE NUMBER		RUNOFF (Q=CiA)							SEWER DESIGN												
FROM	TO	DESCRIPTION / CHARACTERISTIC	A (Ac)	C	C x A (Ac)	SUM OF C x A (Ac)	tc (min)	i (in/hr)	Q (cfs)	SLOPE (%)	PIPE DIAM. (in)	CAPACITY (cfs)	VELOCITY (ft/sec)	PIPE LENGTH (ft)	TIME IN PIPE (min)	UPPER D.S. T.O.C. ELEV.	UPPER D.S. INVERT ELEV.	LOWER D.S. T.O.C. ELEV.	LOWER D.S. INVERT ELEV.	UP D.S. DEPTH (ft)	LOW D.S. (ft)	REMARKS
1-1	1-2	1-1	0.87	0.40	0.348	0.348	8.00	6.25	2.2	0.42	12	**2.31**	3.4	260.0	1.29	960.50	957.50	961.25	956.41	3.00	4.84	
		TOTAL	0.87	0.40	0.348																	
1-2	1-3	1-1	0.87	0.40	0.348	0.530	9.29	5.97	3.2	0.40	14	**3.40**	3.6	167.2	0.77	961.25	956.40	963.70	955.73	4.85	7.97	
		1-2	0.46	0.40	0.182																	
		TOTAL	1.33	0.40	0.530																	
1-3	1-4	1-1,1-2	1.33	0.40	0.530	0.878	10.06	5.81	5.1	0.41	18	**6.73**	4.2	32.0	0.13	963.70	955.73	963.70	955.60	7.97	8.10	
		1-3	0.87	0.40	0.348																	
		TOTAL	2.20	0.40	0.878																	
1-4	1-5	1-1,1-2,1-3	2.20	0.40	0.878	1.119	10.18	5.78	6.5	0.40	18	**6.64**	4.3	154.0	0.59	963.70	955.60	961.09	954.98	8.10	6.11	
		1-4	0.60	0.40	0.241																	
		TOTAL	2.80	0.40	1.119																	
1-5	1-6 FES	1-1,1-2,1-3,1-4	2.80	0.40	1.119	1.119	10.78	5.68	6.4	0.41	18	**6.73**	4.4	43.8	0.17	961.09	954.98		954.80	6.11	-954.80	
		TOTAL	2.80	0.40	1.119																	
		TOTAL																				
2-1	2-2	2-1	0.91	0.40	0.363	0.363	8.00	6.25	2.3	0.41	12	**2.28**	3.3	32.0	0.16	972.03	968.13	972.03	968.00	3.90	4.03	
		TOTAL	0.91	0.40	0.363																	
2-2	2-4 MH	2-1	0.91	0.40	0.363	0.822	8.16	6.21	5.1	0.96	15	**6.33**	5.7	218.0	0.63	972.03	968.00	969.78	965.91	4.03	3.87	
		2-2	1.15	0.40	0.460																	
		TOTAL	2.06	0.40	0.822																	
2-3	2-4 MH	2-3	0.50	0.40	0.200	0.200	8.00	6.25	1.2	2.00	12	**5.04**	5.3	6.0	0.02	969.62	965.60	969.78	965.48	4.02	4.30	
		TOTAL	0.50	0.40	0.200																	

DESIGNED BY: CJN **CHECKED BY:** DFB

File: **21-0300**

RATIONAL METHOD DESIGN

RETURN PERIOD: **10** year **n= 0.013** RCP

PROJECT NAME: Tamarack Nelson
Monticello, MN

STRUCTURE NUMBER		RUNOFF (Q=CiA)								SEWER DESIGN												REMARKS
FROM	TO	DESCRIPTION / CHARACTERISTIC	A (Ac)	C	C x A (Ac)	SUM OF C x A (Ac)	tc (min)	i (in/hr)	Q (cfs)	SLOPE (%)	PIPE DIAM. (in)	CAPACITY (cfs)	VELOCITY (ft/sec)	PIPE LENGTH (ft)	TIME IN PIPE (min)	UPPER D.S. T.O.C. ELEV.	UPPER D.S. INVERT ELEV.	LOWER D.S. T.O.C. ELEV.	LOWER D.S. INVERT ELEV.	UP D.S. DEPTH (ft)	LOW D.S. (ft)	
2-4 MH	2-5	2-1,2-2	2.06	0.40	0.822	3.222	8.79	6.08	19.6	0.40	27	**19.69**	5.7	273.4	0.80	969.78	961.80	967.64	960.70	7.98		
		2-3	0.40	0.40	0.160																	
		Total 8-1 - 8-4 Run	5.60	0.40	2.240																	
		TOTAL	8.06	0.40	3.222																	
2-4 CB	2-5	2-4 CB	0.57	0.40	0.228	0.228	8.02	6.24	1.4	0.46	12	**2.42**	3.2	6.5	0.03	967.38	963.45	967.54	963.42	3.93		
		TOTAL	0.57	0.40	0.228																	
2-6	2-5	2-6	0.46	0.40	0.182	0.182	8.00	6.25	1.1	0.46	12	**2.42**	3.0	6.5	0.04	967.38	963.45	967.64	963.42	3.93	4.22	
		TOTAL	0.46	0.40	0.182																	
2-7	2-8	2-7	0.23	0.40	0.091	0.091	8.00	6.25	0.6	0.85	12	**3.28**	3.1	4.0	0.02	966.97	962.85	966.62	962.82	4.12	3.80	
		TOTAL	0.23	0.40	0.091																	
2-5	2-8	2-1 - 2-3	8.06	0.40	3.222	3.632	9.59	5.90	21.4	0.40	30	**25.94**	5.9	94.6	0.27	967.64	960.70	966.89	960.32	6.94	6.57	
		2-4 CB	0.57	0.40	0.228																	
		2-6	0.46	0.40	0.182																	
		TOTAL	9.08	0.40	3.632																	
2-8	2-10	2-1 - 2-5	9.08	0.40	3.632	3.723	9.86	5.85	21.8	0.40	30	**25.94**	5.9	109.2	0.31		960.32	966.21	959.88	-960.32	6.33	
		2-7	0.23	0.40	0.091																	
		TOTAL	9.31	0.40	3.723																	
2-9	2-10	2-9	0.47	0.40	0.189	0.189	8.00	6.25	1.2	0.76	12	**3.11**	3.7	6.6	0.03	965.94	961.90	966.21	961.85	4.04	4.36	
		TOTAL	0.47	0.40	0.189																	
2-11	2-10	2-11	0.67	0.40	0.268	0.268	8.00	6.25	1.7	0.55	12	**2.64**	3.5	25.4	0.12	965.94	962.04	966.21	961.90	3.90		
		TOTAL	0.67	0.40	0.268																	
2-10	2-13	2-1 - 2-10	10.45	0.40	4.180	4.180	10.17	5.79	24.2	0.57	30	**30.97**	7.0	140.2	0.34	966.21	959.88	966.98	959.08	6.33	7.90	
		TOTAL	10.45	0.40	4.180																	
2-12	2-13	2-12	0.12	0.40	0.048	0.048	8.03	6.24	0.3	1.35	12	**4.14**	3.0	3.0	0.02	966.82	962.88	966.98	962.84	3.94	4.14	
		TOTAL	0.12	0.40	0.048																	
2-13	2-15	2-1 - 2-10	10.45	0.40	4.180	7.699	10.50	5.73	44.1	0.41	42	**64.42**	7.2	310.6	0.72	966.98	959.08	965.21	957.81	7.90	7.40	
		Total Runs 3 & 4	8.68	0.40	3.471																	
		2-12	0.12	0.40	0.048																	
		TOTAL	19.25	0.40	7.699																	
2-14	2-15	2-14	0.46	0.40	0.183	0.183	8.00	6.25	1.1	0.50	12	**2.52**	3.1	6.0	0.03	965.05	961.16	965.21	961.13	3.89	4.08	
		TOTAL	0.46	0.40	0.183																	
2-18	2-15	2-18	1.02	0.40	0.409	0.409	8.00	6.25	2.6	0.46	15	**4.38**	3.7	26.0	0.12	965.05	961.15	965.21	961.03	3.90	4.18	
		TOTAL	1.02	0.40	0.409																	
2-15	2-16	Up to 2-13	19.25	0.40	7.699	8.291	11.22	5.60	46.4	0.41	42	**64.42**	7.3	61.5	0.14	965.21	957.80	965.02	957.55	7.41		
		2-14	0.46	0.40	0.183																	
		2-18	1.02	0.40	0.409																	
		TOTAL	20.73	0.40	8.291																	
2-16	2-17 FES	Up to 2-15	20.73	0.40	8.291	8.470	11.36	5.57	47.2	0.14	48	**53.75**	4.8	177.7	0.61	964.69	955.25		955.00	9.44	-955.00	
		2-16	0.45	0.40	0.179																	

DESIGNED BY: CJN **CHECKED BY:** DFB

File: **21-0300**

RATIONAL METHOD DESIGN

RETURN PERIOD: **10** **year** **n=** **0.013** RCP

PROJECT NAME: Tamarack Nelson
Monticello, MN

STRUCTURE NUMBER		RUNOFF (Q=CiA)								SEWER DESIGN													
FROM	TO	DESCRIPTION / CHARACTERISTIC	A (Ac)	C	C x A (Ac)	SUM OF C x A (Ac)	tc (min)	i (in/hr)	Q (cfs)	SLOPE (%)	PIPE DIAM. (in)	CAPACITY (cfs)	VELOCITY (ft/sec)	PIPE LENGTH (ft)	TIME IN PIPE (min)	UPPER D.S. T.O.C. ELEV.	UPPER D.S. INVERT ELEV.	LOWER D.S. T.O.C. ELEV.	LOWER D.S. INVERT ELEV.	UP D.S. DEPTH (ft)	LOW D.S. (ft)	REMARKS
		TOTAL	21.17	0.40	8.470																	
		TOTAL																				
		TOTAL																				
4-1	4-2	4-1	0.29	0.40	0.115	0.115	8.00	6.25	1.1	2.29	12	**5.39**	5.3	93.8	0.29	992.35	988.45	990.30	986.30		4.00	
		TOTAL	0.29	0.40	0.115																	
4-3	4-2					0.238	8.29	6.18	1.5	0.41	12	**2.28**	3.1	32.0	0.17	990.30	986.43	990.30	986.30	3.87	4.00	
		4-3	0.60	0.40	0.238																	
		TOTAL	0.60	0.40	0.238																	
4-2	4-4	4-1,4-3	0.88	0.40	0.353	0.372	8.47	6.15	2.3	4.18	15	**13.21**	8.1	270.1	0.56	990.30	986.30	978.90	975.00	4.00	3.90	
		4-2	0.05	0.40	0.018																	
		TOTAL	0.93	0.40	0.372																	
4-5	4-4	4-5	0.70	0.40	0.280	0.280	8.00	6.25	1.7	0.40	12	**2.25**	3.2	37.3	0.20	978.04	974.05	978.90	973.90	3.99	5.00	
		TOTAL	0.70	0.40	0.280																	

DESIGNED BY: CJN **CHECKED BY:** DFB

File: **21-0300**

RATIONAL METHOD DESIGN

RETURN PERIOD: **10** year **n= 0.013** RCP

PROJECT NAME: Tamarack Nelson
Monticello, MN

STRUCTURE NUMBER		RUNOFF (Q=CiA)							SEWER DESIGN											REMARKS
FROM	TO	DESCRIPTION / CHARACTERISTIC	A (Ac)	C	C x A (Ac)	SUM OF C x A (Ac)	tc (min)	i (in/hr)	Q (cfs)	SLOPE (%)	PIPE DIAM. (in)	CAPACITY (cfs)	VELOCITY (ft/sec)	PIPE LENGTH (ft)	TIME IN PIPE (min)	UPPER D.S. T.O.C. ELEV.	UPPER D.S. INVERT ELEV.	LOWER D.S. T.O.C. ELEV.	LOWER D.S. INVERT ELEV.	UP D.S. DEPTH (ft)	LOW D.S. (ft)	
4-4	4-6	4-1 - 4-3, 4-2	1.63	0.40	0.652	0.822	9.03	6.03	5.0	2.25	15	**9.69**	7.9	278.5	0.59	978.90	973.90	971.54	967.64	5.00	3.90	
		4-4	0.43	0.40	0.171																	
		TOTAL	2.06	0.40	0.822																	
4-7	4-6	4-7	0.65	0.40	0.261	0.261	8.00	6.25	1.6	0.41	12	**2.28**	3.1	32.0	0.17	971.54	967.57	971.54	967.44	3.97	4.10	
		TOTAL	0.65	0.40	0.261																	
4-6	4-8	4-6	0.48	0.40	0.190	1.274	9.61	5.90	7.5	1.19	18	**11.46**	6.9	255.3	0.62	971.54	967.29	968.23	964.25	4.25	3.98	
		4-1,4-2,4-3,4-4,4-5,4-7	2.71	0.40	1.083																	
		TOTAL	3.18	0.40	1.274																	
4-8	4-9	4-1 thru 4-7	3.18	0.40	1.274	2.547	10.23	5.78	14.7	0.87	21	**14.74**	7.0	115.6	0.27	968.23	964.00	966.91	963.00	4.23	3.91	
		4-8	0.30	0.40	1.274																	
		TOTAL	3.48	0.73	2.547																	
4-9	4-10	4-9	0.21	0.40	0.085	1.479	10.51	5.73	8.5	0.73	21	**13.54**	5.9	143.2	0.40	966.91	963.00	965.76	961.95	3.91	3.81	
		4-1 thru 4-8	3.48	0.40	1.394																	
		TOTAL	3.70	0.40	1.479																	
4-10	4-12	4-1 thru 4-9	4.27	0.40	1.708	2.388	10.91	5.65	13.5	1.23	21	**17.60**	8.1	129.6	0.27	965.76	961.38	966.84	959.78	4.38	7.06	
		4-11	1.70	0.40	0.680																	
		TOTAL	5.97	0.40	2.388																	
4-11	4-10	4-11	1.70	0.40	0.680	0.680	8.00	6.25	4.2	1.18	15	**7.02**	6.0	32.2	0.09	965.76	961.76	965.76	961.38	4.00	4.38	
		TOTAL	1.70	0.40	0.680																	
4-12	2-13	4-10	5.97	0.40	2.388	2.388	11.18	5.61	13.4	0.40	36	**42.18**	5.3	171.0	0.54	966.98	959.78	966.98	959.10	7.20	7.88	
		3-4	2.71																			
		TOTAL	8.68	0.28	2.388																	
8-1	8-2	8-1	1.70	0.40	0.681	0.681	8.00	6.25	4.3	0.40	18	**6.64**	4.0	180.2	0.76	967.00	964.00	966.50	963.28	3.00	3.22	
		TOTAL	1.70	0.40	0.681																	
8-2	8-3	8-1	1.70	0.40	0.681	1.076	8.76	6.09	6.5	0.40	18	**6.61**	4.3	166.7	0.65	966.50	963.28	967.03	962.62	3.22	4.41	
		8-2	0.99	0.40	0.681																	
		TOTAL	2.69	0.40	1.076																	
8-3	8-4	8-1,8-2	2.69	0.40	1.076	1.752	9.40	5.95	10.4	0.41	24	**14.49**	5.0	32.0	0.11	967.03	962.62	967.06	962.49	4.41	4.57	
		8-3	1.69	0.40	0.676																	
		TOTAL	4.38	0.40	1.752																	
8-4	2-3.5	8-1 thru 8-3	4.38	0.40	1.752	2.240	9.51	5.92	13.3	0.40	24	**14.31**	5.2	173.2	0.56	967.06	962.49	969.78	961.80	4.57	7.98	
		8-4	1.22	0.40	0.488																	
		TOTAL	5.60	0.40	2.240																	
		TOTAL																				
3-1	3-3	3-1	0.70	0.40	0.282	0.282	8.00	6.25	1.8	0.42	12	**2.31**	3.2	33.4	0.17	965.97	962.97	965.20	962.83	3.00	2.37	
		TOTAL	0.70	0.40	0.282																	
3-2	3-3	3-2	1.79	0.40	0.715	0.715	8.00	6.25	4.5	0.40	18	**6.64**	4.0	137.7	0.57	964.20	961.20	965.20	960.65	3.00		

DESIGNED BY: CJN **CHECKED BY:** DFB

File: **21-0300**

RATIONAL METHOD DESIGN

RETURN PERIOD: **10** year **n=** **0.013** RCP

PROJECT NAME: Tamarack Nelson
Monticello, MN

STRUCTURE NUMBER		RUNOFF (Q=CiA)								SEWER DESIGN												REMARKS
FROM	TO	DESCRIPTION / CHARACTERISTIC	A (Ac)	C	C x A (Ac)	SUM OF C x A (Ac)	tc (min)	i (in/hr)	Q (cfs)	SLOPE (%)	PIPE DIAM. (in)	CAPACITY (cfs)	VELOCITY (ft/sec)	PIPE LENGTH (ft)	TIME IN PIPE (min)	UPPER D.S. T.O.C. ELEV.	UPPER D.S. INVERT ELEV.	LOWER D.S. T.O.C. ELEV.	LOWER D.S. INVERT ELEV.	UP D.S. DEPTH (ft)	LOW D.S. (ft)	
		TOTAL	1.79	0.40	0.715																	
3-3	3-4	3-1,3-2	2.49	0.40	0.996	0.996	8.17	6.21	6.2	0.40	18	**6.66**	4.3	215.8	0.84	965.20	960.65	966.58	959.78	4.55	6.80	
		3-3		0.40																		
		TOTAL	2.49	0.40	0.996																	
3-4	4-12	3-1,3-2,3-3	2.49	0.40	0.996	1.083	11.75	5.50	6.0	0.50	18	**7.43**	4.7	6.0	0.02	966.58	959.78	966.84	959.75	6.80	7.09	
		3-4	0.22	0.40	0.087																	
		TOTAL	2.71	0.40	1.083																	
		TOTAL																				
5-1	5-2	5-1	1.92	0.40	0.767	0.767	8.00	6.25	4.8	0.40	18	**6.64**	4.1	112.2	0.46	968.50	965.50	969.01	965.05	3.00		
		TOTAL	1.92	0.40	0.767																	
5-2	5-3	5-1	1.92	0.40	0.767	0.965	8.46	6.15	5.9	0.40	18	**6.64**	4.3	113.0	0.44	969.01	965.05	968.21	964.60	3.96	3.61	
		5-2	0.49	0.40	0.198																	
		TOTAL	2.41	0.40	0.965																	
5-3	5-4	5-1,5-2	2.41	0.40	0.965	1.039	8.90	6.05	6.3	0.41	18	**6.73**	4.3	32.1	0.12	968.21	964.21	968.21	964.08	4.00	4.13	
		5-3	0.19	0.40	0.074																	
		TOTAL	2.60	0.40	1.039																	
5-4	5-7	5-1,5-2,5-3	2.60	0.40	1.039	1.200	9.02	6.03	7.2	1.41	18	**12.47**	7.3	60.2	0.14	968.21	964.08	967.76	963.23	4.13	4.53	
		5-4	0.40	0.40	0.161																	
		TOTAL	3.00	0.40	1.200																	
		5-5	0.75	0.40	0.299																	
5-5	5-6					0.299	8.00	6.25	1.9	0.41	12	**2.28**	3.2	32.0	0.16	968.34	964.34	968.34	964.21	4.00	4.13	
		TOTAL	0.75	0.40	0.299																	
5-6	5-7	5-5	0.75	0.40	0.300	0.727	8.16	6.21	4.5	0.40	18	**6.64**	4.0	59.5	0.25	968.34	964.21	967.69	963.97	4.13	3.72	
		5-6	1.07	0.40	0.427																	
		TOTAL	1.82	0.40	0.727																	
5-7	5-8	No drain combine 2 runs	4.82	0.40	1.926	1.926	9.16	6.00	11.6	0.42	24	**14.66**	5.2	28.8	0.09	967.78	963.23	967.53	963.11	4.55	4.42	
		TOTAL	4.82	0.40	1.926																	
5-8	5-9	Total	4.82	0.40	1.926	1.933	9.25	5.98	11.6	0.40	24	**14.24**	5.0	144.2	0.48	967.58	963.11	966.49	962.54	4.47	3.95	
		5-8	0.02	0.40	0.006																	
		TOTAL	4.83	0.40	1.933																	
5-9	5-10	Total	4.83	0.40	1.933	2.014	9.73	5.88	11.8	0.40	24	**14.31**	5.1	138.3	0.45	966.49	962.54	965.70	961.99	3.95	3.71	
		5-9	0.20	0.40	0.081																	
		TOTAL	5.04	0.40	2.014																	
		5-11	0.55	0.40	0.220																	
5-11	5-12					0.220	8.00	6.25	1.4	0.40	12	**2.25**	3.0	130.0	0.72	964.00	961.00	964.00	960.48	3.00	3.52	
		TOTAL	0.55	0.40	0.220																	
5-12	5-13	5-11	0.55	0.40	0.220	0.495	8.72	6.09	3.0	0.40	14	**3.40**	3.6	135.0	0.62	964.00	960.48	965.50	959.94	3.52	5.56	
		5-12	0.69	0.40	0.275																	
		TOTAL	1.24	0.40	0.495																	
5-14	5-15	5-14	6.61	0.40	2.642	2.642	8.00	6.25	16.5	0.56	24	**16.93**	6.2	317.8	0.86	966.29	963.29	966.53	961.51	3.00	5.02	
		TOTAL	6.61	0.40	2.642																	
		5-14	6.61	0.40	2.642																	
5-15	5-13	5-15	0.61	0.40	0.242	2.884	8.86	6.06	17.5	0.86	24	**20.98**	7.5	180.6	0.40	966.53	962.03	965.50	960.48	4.50	5.02	

DESIGNED BY: CJN **CHECKED BY:** DFB

File: **21-0300**

RATIONAL METHOD DESIGN

RETURN PERIOD: **10** year **n=** **0.013** RCP

PROJECT NAME: Tamarack Nelson
Monticello, MN

STRUCTURE NUMBER		RUNOFF (Q=CiA)								SEWER DESIGN												REMARKS
FROM	TO	DESCRIPTION / CHARACTERISTIC	A (Ac)	C	C x A (Ac)	SUM OF C x A (Ac)	tc (min)	i (in/hr)	Q (cfs)	SLOPE (%)	PIPE DIAM. (in)	CAPACITY (cfs)	VELOCITY (ft/sec)	PIPE LENGTH (ft)	TIME IN PIPE (min)	UPPER D.S. T.O.C. ELEV.	UPPER D.S. INVERT ELEV.	LOWER D.S. T.O.C. ELEV.	LOWER D.S. INVERT ELEV.	UP D.S. DEPTH (ft)	LOW D.S. (ft)	
~~5-15~~	~~5-15~~					~~2.884~~	~~6.00~~	~~6.00~~	~~17.9~~	~~0.50~~	~~24~~	~~**20.98**~~	~~7.9~~	~~180.6~~	~~0.40~~	~~966.55~~	~~962.05~~	~~965.50~~	~~960.48~~	~~4.50~~	~~5.02~~	
		TOTAL	7.21	0.40	2.884																	
5-13	5-16	5-14,5-15	7.21	0.40	2.884	3.588	9.26	5.98	21.4	0.40	30	**25.94**	5.9	139.4	0.39	965.50	959.94	965.70	959.38	5.56	6.32	
		5-11,5-12	1.24	0.40	0.495																	
		5-13	0.52	0.40	0.209																	
		TOTAL	8.97	0.40	3.588																	
5-16	5-10	5-11 through 5-15	8.97	0.40	3.588	4.240	9.65	5.89	25.0	0.41	30	**26.26**	6.1	32.1	0.09	965.70	959.38	965.70	959.25	6.32	6.45	
		5-16	1.63	0.40	0.652																	
		TOTAL	10.60	0.40	4.240																	
5-10	5-17	Up to 5-16	10.60	0.40	4.240	6.411	9.74	5.87	37.7	0.77	36	**58.53**	8.8	130.6	0.25	965.71	956.91	962.35	955.90	8.80	6.45	
		5-10	0.39	0.40	0.156																	
		5-9	5.04	0.40	2.014																	
		TOTAL	16.03	0.40	6.411																	
5-17	5-18 FES	Total	16.03	0.40	6.411	6.411	9.99	5.82	37.3	0.35	36	**39.68**	6.4	183.9	0.48	962.35	955.65		955.00	6.70	-955.00	
		No drain																				
		TOTAL	16.03	0.40	6.411																	
		TOTAL																				
6-1 FES	6-2	6-1	1.46	0.40	0.584	0.584	8.00	6.25	3.7	1.07	12	**3.69**	5.4	172.8	0.53		961.60	963.88	959.75	-961.60	4.13	
		TOTAL	1.46	0.40	0.584																	
6-3	6-2	6-3	0.73	0.40	0.291	0.291	8.00	6.25	1.8	0.41	12	**2.28**	3.2	32.0	0.17	963.88	959.88	963.88	959.75	4.00	4.13	
		TOTAL	0.73	0.40	0.291																	
6-2	6-5	6-1,6-3	2.19	0.40	0.876	1.162	8.53	6.13	7.1	0.90	18	**9.94**	6.1	375.1	1.02	963.88	959.50	960.18	956.14	4.38	4.04	
		6-2	0.72	0.40	0.286																	
		TOTAL	2.90	0.40	1.162																	
6-4	6-5	6-4	0.75	0.40	0.300	0.300	8.00	6.25	1.9	0.41	12	**2.28**	3.2	32.0	0.16	960.17	956.17	960.18	956.04	4.00	4.14	
		TOTAL	0.75	0.40	0.300																	
6-5	6-6	6-1 - 6-4	3.65	0.40	1.461	1.756	9.56	5.91	10.4	0.77	21	**13.90**	6.3	132.6	0.35	959.86	956.00	958.56	954.98	3.86	3.58	
		6-5	0.74	0.40	0.295																	
		TOTAL	4.39	0.40	1.756																	
6-6	6-8	6-1,6-2,6-3,6-4,6-5	4.39	0.40	1.756	1.852	9.91	5.84	10.8	0.48	21	**10.98**	5.2	141.8	0.45	958.91	955.01	957.76	954.33	3.90	3.43	
		6-6	0.24	0.40	0.096																	
		TOTAL	4.63	0.40	1.852																	
6-7	6-8	6-7	0.33	0.40	0.131	0.131	8.00	6.25	0.8	0.69	12	**2.96**	3.2	32.0	0.17	958.30	954.55	957.76	954.33	3.75	3.43	
		TOTAL	0.33	0.40	0.131																	
6-8	6-9 FES	6-1 through 6-7	4.96	0.40	1.984	2.073	10.36	5.75	11.9	0.60	21	**12.27**	5.9	37.3	0.11	957.76	954.33		954.11	3.43	-954.11	
		6-8	0.22	0.40	0.089																	
		TOTAL	5.18	0.40	2.073																	
		TOTAL																				
7-1 FES	7-2 FES	7-1	6.28	0.40	2.510	2.510	8.00	6.25	15.7	0.50	24	**16.00**	5.8	238.0	0.68		955.00		953.81	-955.00	-953.81	
		TOTAL	6.28	0.40	2.510																	

DESIGNED BY: CJN **CHECKED BY:** DFB

File: **21-0300**

RATIONAL METHOD DESIGN

RETURN PERIOD: **10** **year** **n= 0.013** RCP

PROJECT NAME: Tamarack Nelson
Monticello, MN

STRUCTURE NUMBER		RUNOFF (Q=CiA)								SEWER DESIGN													
FROM	TO	DESCRIPTION / CHARACTERISTIC	A (Ac)	C	C x A (Ac)	SUM OF C x A (Ac)	tc (min)	i (in/hr)	Q (cfs)	SLOPE (%)	PIPE DIAM. (in)	CAPACITY (cfs)	VELOCITY (ft/sec)	PIPE LENGTH (ft)	TIME IN PIPE (min)	UPPER D.S. T.O.C. ELEV.	UPPER D.S. INVERT ELEV.	LOWER D.S. T.O.C. ELEV.	LOWER D.S. INVERT ELEV.	UP D.S. DEPTH (ft)	LOW D.S. (ft)	REMARKS
		TOTAL																				
1-7 FES	1-8 FES	Drains into pond 1	0.82	0.40	0.327	0.327	8.00	6.25	2.0	1.75	12	**4.71**	5.8	44.0	0.13		959.25		958.48	-959.25	-958.48	
		TOTAL	0.82	0.40	0.327																	
1-9 FES	1-10 FES	Drains into pond 1	0.44	0.40	0.176	0.176	8.00	6.25	1.1	2.75	12	**5.91**	5.7	44.0	0.13		957.85		956.64	-957.85	-956.64	
		TOTAL	0.44	0.40	0.176																	

Appendix D

Additional Design Information

Geotechnical Evaluation Report

Monticello – Nelson Site
NE Quadrant of Fallon Avenue NE and 85th Street NE
Monticello, Minnesota

Prepared for

Tamarack Land Development

DRAFT

Professional Certification:
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.

Daniel J. Leffler, PE
Project Engineer
License Number: 58736
April 7, 2022

Project B2111878

Braun Intertec Corporation

Braun Intertec Corporation
11001 Hampshire Avenue S
Minneapolis, MN 55438

Phone: 952.995.2000
Fax: 952.995.2020
Web: braunintertec.com

April 7, 2022 Project B2111878

Mr. Dan Willenbring
Tamarack Land Development
1536 Beachcomber Boulevard
Waconia, MN 55387

Re: Geotechnical Evaluation
Monticello – Nelson Site
NE Quadrant of Fallon Avenue NE and 85th Street NE
Monticello, Minnesota

Dear Mr. Willenbring:

We are pleased to present this Geotechnical Evaluation Report for the proposed residential development on the Nelson Property in Monticello, Minnesota. Please read the entire attached report for details regarding our findings and recommendations.

Thank you for making Braun Intertec your geotechnical consultant for this project. If you have questions about this report, or if there are other services that we can provide in support of our work to date, please contact Dan Leffler at 952.995.2354 (dleffler@braunintertec.com) or Joe Westphal at 952.995.2238 (jwestphal@braunintertec.com)

Sincerely,

BRAUN INTERTEC CORPORATION

Daniel J. Leffler, PE
Project Engineer

Joseph L. Westphal, PE
Account Leader, Senior Engineer

c: Mr. Jim Osterberg, Tamarack Land Development
Mr. Brian Theis, Tamarack Land Development
Chris Dahn, PE, Bogart Pederson & Associates, Inc.

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Appendix

Soil Boring Location Sketch
Log of Boring Sheets ST-1 through ST-16
Descriptive Terminology of Soil

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A. Introduction

A.1. Project Description

Tamarack Land Development is planning to develop a single-family housing development on the Nelson Property in Monticello, Minnesota. The site consists of two separate parcels totaling about 67 acres in size. The proposed development will consist of 164 single-family house pads along with associated streets, underground utilities, and stormwater features/ponds.

The figure below shows an illustration of the proposed site layout.

Figure 1. Proposed Site Layout



Figure prepared by Bogart Pederson & Associates, Inc., undated.

A.1.a. Structural Loads

We understand the construction will consist of one- to two-story wood-framed houses with pitched roofs and full or partial basements on poured concrete foundations. Based on the residential construction, we have based on our analysis and recommendations on the assumption that footing pressures will not exceed 2,000 psf. Please contact us if this information is not correct.

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A.1.b. Pavement Traffic Loads

We have assumed that bituminous pavements, typical of residential neighborhoods, will be subjected to normal traffic conditions over a design life of 20 years.

A.2. Site Conditions and History

The site has historically and is currently used primarily for agricultural purposes. The site appears to have a few lowlands/wetlands along the north property line in the northeast corner and northwest corner of the property. The property also has a farmstead located on the west property line and a single-family house near the southwest property line. However, both farmsteads will not be part of the proposed development.

The site is gently rolling with grades ranging from approximately elevations ranging from 954 to 1004 feet Mean Sea Level (MSL). The grades are generally sloping downward from the southeast corner to the northwest corner of the property.

Photograph 1. Aerial Photograph of the Site in 2018



Photograph provided by Google Earth.

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A.3. Purpose

The purpose of our geotechnical evaluation will be to characterize subsurface geologic conditions at selected exploration locations and evaluate their impact on the design and construction of the proposed residential development.

A.4. Background Information and Reference Documents

We reviewed the following information:

- An undated Concept Sketch Plan, prepared by Bogart Pederson.
- Available public aerial photographs showing the existing site conditions.
- Geologic Atlas showing the general soil types present in this area.

We have described our understanding of the proposed construction and site to the extent others reported it to us. Depending on the extent of available information, we may have made assumptions based on our experience with similar projects. If we have not correctly recorded or interpreted the project details, the project team should notify us. New or changed information could require additional evaluation, analyses and/or recommendations.

A.5. Scope of Services

We performed our scope of services for the project in accordance with our Proposal QTB150245 to Tamarack Land Development, dated December 8, 2021. The following list describes the geotechnical tasks completed in accordance with our authorized scope of services.

- Reviewing the background information and reference documents previously cited.
- Staking and clearing the exploration location of underground utilities. We selected and staked the new exploration locations. We acquired the surface elevations and locations with GPS technology using the State of Minnesota's permanent GPS base station network. The Soil Boring Location Sketch included in the Appendix shows the approximate locations of the borings.

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- Performing 16 standard penetration test (SPT) borings, denoted as ST-1 to ST-16, to a nominal depth of 14 1/2 feet below grade across the site. However, while drilling boring ST-2 the boring was extended due to low relative densities encountered at depth, thus, the boring was extended to 20 feet below grade.

- Performing laboratory testing on select samples to aid in soil classification and engineering analysis.

- Preparing this report containing a boring location sketch, logs of soil borings, a summary of the soils encountered, results of laboratory tests, and recommendations for structure and pavement subgrade preparation and the design of foundations, floor slabs, exterior slabs, utilities, stormwater improvements, and pavements.

Our scope of services did not include environmental services or testing and our geotechnical personnel performing this evaluation are not trained to provide environmental services or testing. We can provide environmental services or testing at your request.

B. Results

B.1. Geologic Overview

We based the geologic origins used in this report on the soil types, in-situ and laboratory testing, and available common knowledge of the geological history of the site. Because of the complex depositional history, geologic origins can be difficult to ascertain. We did not perform a detailed investigation of the geologic history for the site.

B.2. Boring Results

Table 1 provides a summary of the soil boring results in the general order we encountered the strata. Please refer to the Log of Boring sheets in the Appendix for additional details. The Descriptive Terminology of Soil sheet in the Appendix includes definitions of abbreviations used in Table 1.

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Table 1. Subsurface Profile Summary*

Strata	Soil Type - ASTM Classification	Range of Penetration Resistances	Commentary and Details
Topsoil	SM, SC, CL	---	▪ Predominantly lean clay with lesser amounts of clayey sand and silty sand. ▪ Dark brown to black. ▪ Thicknesses at boring locations varied from 1 1/4 to 2 1/2 feet. ▪ Moisture condition generally moist.
Slopewash	SM	7 BPF	▪ Only encountered in Boring ST-14. ▪ Dark gray in color. ▪ Thickness at boring location extended about 4 feet below grade.
Alluvial	SP-SM, SM, SC, CL	4 to 11 BPF	▪ Not encountered in every boring. ▪ Generally brown and gray in color. ▪ Variable amounts of gravel. ▪ Moisture condition generally moist.
Glacial deposits	SC, CL, SM, SC-SM, SP-SM	4 to 18 BPF	▪ Predominantly sandy lean clay or clayey sand with lesser amounts of silty clayey sand, silty sand, and sand. ▪ Variable amounts of gravel. ▪ Generally brown in color changing to gray at depth. ▪ Moisture condition generally moist, however wet sand soils were observed in Boring ST-6.

*Abbreviations defined in the attached Descriptive Terminology of Soil sheet.

B.3. Groundwater

While performing the soil borings, one boring location encountered groundwater. Table 2 summarizes the depth where we observed groundwater; the attached Log of Boring sheets in the Appendix also include this information and additional details.

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Table 2. Groundwater Summary

Location	Measured Surface Elevation (ft MSL)	Measured Depth to Groundwater (ft)	Corresponding Groundwater Elevation (ft MSL)
ST-6	986.9	9	981

At the time of our observation, the groundwater surface elevation appeared to be about elevation 981 feet. However, it is our opinion this water was in a perched condition due to lack of groundwater in adjacent borings and with surface grades on the western portion of the site being below an elevation of 981 feet MSL and being dry. The soil borings indicate a layered soil profile that is conducive for encountering perched water conditions.

Groundwater may take days or longer to reach equilibrium in the boreholes and we immediately backfilled the boreholes, in accordance with our scope of work. If the project team identifies a need for more accurate determination of groundwater depth, we can install piezometers. Project planning should anticipate seasonal and annual fluctuations of groundwater.

B.4. Laboratory Test Results

The boring logs show the results of the laboratory testing we performed, next to the tested sample depths. The laboratory tests were all completed in general conformance with the applicable ASTM standards. The Log of Boring sheets are in the Appendix of this report.

The moisture content tests (ASTM D 2216) performed on selected clay soil samples showed moisture contents ranging from about 13 to 34 percent, indicating the clay to be slightly below to well above its probable optimum moisture content. The selected sand soil samples showed moisture contents ranging from about 7 to 15 percent, indicating the sand is slightly below to near its probable optimum moisture content.

The percent passing the #200 sieve (ASTM C117) tests on selected soil samples from Borings ST-1, ST-3, ST-7, and ST-14, indicated that the selected soil samples contained 41 percent, 81 percent, 9 percent and 55 percent, respectively, silt and clay, by weight passing the #200 sieve. These results correlate to soil types of clayey sand, lean clay with sand, poorly graded sand with silt, and sandy lean clay, respectively.

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One soil sample from the 5-foot depth in Boring ST-13 was classified using the Atterberg Limits test (ASTM D4318). The result indicated a liquid limit of 35, a plasticity limit of 21, and a plasticity index of 14. This classifies the soils as lean clay.

Pocket penetrometer tests were completed on selected clayey soil samples to estimate the unconfined compressive strength of the soils. The results ranged from about 1/4 to 3 1/2 tons per square foot (tsf).

C. Recommendations

C.1. Design and Construction Discussion

C.1.a. Building Subgrade Preparation

Based on the results of our subsurface exploration and evaluation, spread footing foundation bearing on engineered fill and/or native alluvium or glacially deposited soils that can support the proposed houses after performing typical subgrade preparation. Typical subgrade preparation includes removing existing vegetation, topsoil, organic soils, fill soils, and soft clays. Any existing structures, wells, septic systems and field drain tiles should also be removed from proposed house pads and roadways during mass grading.

C.1.b. Reuse of On-Site Soils

The on-site alluvial and glacial soils, free of organic materials and debris, appear suitable for reuse as engineered fill. We caution, some of the on-site soils appear to be significantly wet of their estimated optimum moisture contents. As such, it should be anticipated some moisture conditioning (drying) will be required prior to reuse and compaction. The summer months of June through September are the most favorable time to dry the wet clayey soil.

Any materials to be used as engineered fill should be tested and approved by the geotechnical engineer prior to placement.

C.1.c. Groundwater

Groundwater was observed in one boring while performing our evaluation, which appeared to be perched. We anticipate perched water will be encountered throughout site grading, as the soil profiled contains intermixed layers of sand and clay. Groundwater that accumulates in excavations from perched water or rainfall, we recommend immediately removing the collected water prior to placement of fill or constructing foundations.

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C.1.d. Construction Disturbance

We caution that the clayey nature of some of the site soils makes them highly susceptible to disturbance from construction or excessive moisture. Care should be taken not to disturb these soils during construction, as once stable subgrades can be destabilized and require additional moisture conditioning and compacting. Also, care should be taken to remove any accumulating water from prepared subgrades after rain events.

C.2. Site Grading and Subgrade Preparation

C.2.a. Building Subgrade Excavations

We recommend removing unsuitable materials from beneath house pads and oversize areas. We define unsuitable materials as existing fill, frozen materials, organic soils, existing structures, existing utilities, vegetation, and soft clay soils. Also, in agricultural fields, there are likely buried drain tiles which will need to be removed.

Table 3 shows the anticipated excavation depths and bottom of soil correction excavation elevations at each of the current soil boring locations, assuming that structures, utilities, or roads will be built at each location. Excavation depths could be reduced in areas that will not support future structures, utilities, and roads.

Table 3. Building Excavation Depths

Location	Measured Surface Elevation (ft MSL)	Anticipated Excavation Depth (ft)	Anticipated Bottom Elevation (ft MSL)
ST-1	958.7	2	956 1/2
ST-2	956.1	2	954
ST-3	956.3	2 1/2	954
ST-4	965.7	1 1/2-4*	964-961 1/2*
ST-5	963.7	1 1/2	962
ST-6	986.9	1 1/2-4*	985 1/2-983*
ST-7	962.1	2	960

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ST-8	964.7	2-4	960 1/2-962 1/2*
ST-9	962.2	1 1/2	960 1/2
ST-10	962.9	2-4*	961-959*
ST-11	970.1	1 1/2	968 1/2
ST-12	968.2	1 1/2	966 1/2
ST-13	977.3	1 1/2	976
ST-14	975.7	4	972
ST-15	974.7	2	972 1/2
ST-16	999.3	1 1/2	997 1/2

*The depth of soil correction work should be determined in the field during site grading.

Excavation depths will vary between the borings. Portions of the excavations may also extend deeper than indicated by the borings. A geotechnical representative should observe the excavations to make the necessary field judgments regarding the suitability of the exposed soils.

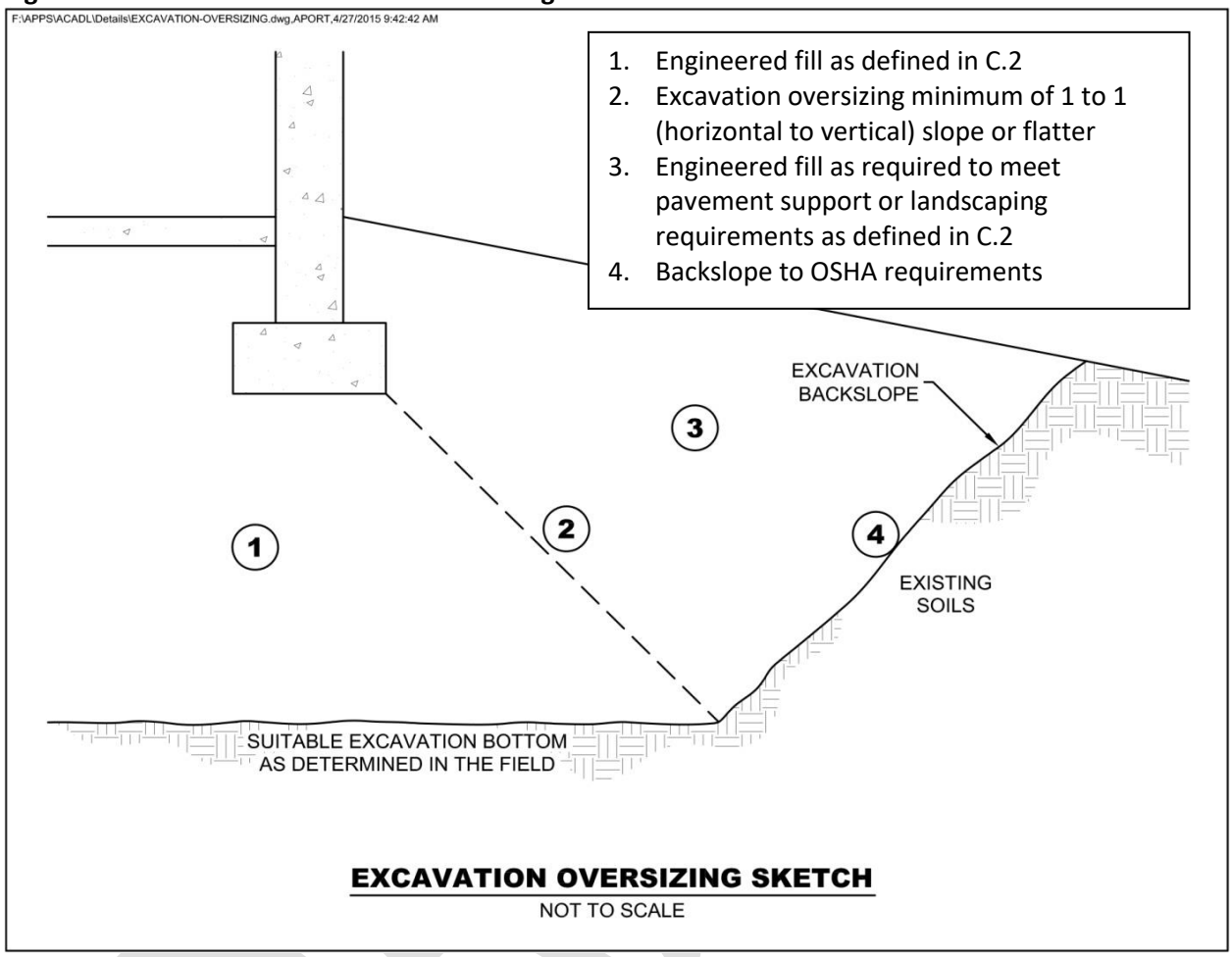
The contractor should use equipment and techniques to minimize soil disturbance. If soils become disturbed or are wet, we recommend excavation and replacement.

C.2.b. Excavation Oversizing

When removing unsuitable materials below structures or pavements, we recommend the excavation extend outward and downward at a slope of 1H:1V (horizontal:vertical) or flatter. See Figure 2 for an illustration of excavation oversizing.

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Figure 2. Generalized Illustration of Oversizing



C.2.c. Excavated Slopes

Based on the borings, we anticipate on-site soils in excavations will consist of both clayey and sandy soils. Clayey soils are typically considered Type B Soil under OSHA (Occupational Safety and Health Administration) guidelines. OSHA guidelines indicate unsupported excavations in Type B soils should have a gradient no steeper than 1H:1V. Sandy soils are typically considered Type C Soil under OSHA (Occupational Safety and Health Administration) guidelines. OSHA guidelines indicate unsupported excavations in Type C soils should have a gradient no steeper than 1.5H:1V. Slopes constructed in this manner may still exhibit surface sloughing. OSHA requires an engineer to evaluate slopes or excavations over 20 feet in depth.

An OSHA-approved qualified person should review the soil classification in the field. Excavations must comply with the requirements of OSHA 29 CFR, Part 1926, Subpart P, "Excavations and Trenches." This document states excavation safety is the responsibility of the contractor. The project specifications should reference these OSHA requirements.

C.2.d. Filling on Slopes

Where existing or excavated slopes are steeper than 4H:1V, we recommend placing fill from low to high elevations on horizontal benches cut into the native soils so that successive lifts are spread and compacted on level surfaces, and potential failure surfaces are not created along the fill's lower boundary. Depending on fill requirements, the contractor can construct benches by cutting into existing grades while placing fill (the composition of the exposed soils being in compliance with fill specifications), or by cutting the benches in advance of filling (to prevent mixing with soils not in compliance with fill specifications). The height of a given bench may vary but the width should consistently be great enough to accommodate large, self-propelled compaction equipment.

C.2.e. Excavation Dewatering

We recommend removing groundwater from the excavations. Project planning should include temporary sumps and pumps for excavations in low-permeability soils, such as clays.

C.2.f. Pavement and Exterior Slab Subgrade Preparation

We recommend the following steps for pavement and exterior slab subgrade preparation. Note that project planning may need to require additional subcuts to limit frost heave.

1. Strip unsuitable soils consisting of vegetation, topsoil, organic soils, and existing fill down to native soils.

2. Have a geotechnical representative observe the excavated subgrade to evaluate if additional subgrade improvements are necessary.

3. Slope subgrade soils to areas of sand or drain tile (if fine grained soils are present) to allow the removal of accumulating water.

4. Scarify, moisture condition, and surface compact the subgrade with at least three passes of a large roller with a minimum drum diameter of 3 1/2 feet.

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5. Place pavement engineered fill to grade and compact in accordance with Section C.2.h to bottom of pavement and exterior slab section.

6. Proofroll the pavement or exterior slab subgrade as described in Section C.2.g.

C.2.g. Pavement Subgrade Proofroll

After preparing the subgrade as described above and prior to the placement of the aggregate base, we recommend proofrolling the subgrade soils with a fully loaded tandem-axle truck. We also recommend having a geotechnical representative observe the proofroll. Areas that fail the proofroll likely indicate soft or weak areas that will require additional soil correction work to support pavements.

The contractor should correct areas that display excessive yielding or rutting during the proofroll, as determined by the geotechnical representative. Possible options for subgrade correction include moisture conditioning and recompaction, subcutting and replacement with soil or crushed aggregate, chemical stabilization and/or using geotextiles. We recommend performing a second proofroll after the aggregate base material is in place, and prior to placing bituminous or concrete pavement.

C.2.h. Engineered Fill Materials and Compaction

Table 4 below contains our recommendations for engineered fill materials.

Table 4. Engineered Fill Materials*

Locations To Be Used	Engineered Fill Classification	Possible Soil Type Descriptions	Gradation	Additional Requirements
▪ Below foundations ▪ Below interior slabs	Structural fill	SP, SP-SM, SM, SC-SM, SC, CL	100% passing 2-inch sieve	< 2% Organic Content (OC) Plasticity Index (PI) < 20%
▪ Drainage layer ▪ Non-frost-susceptible	▪ Free-draining ▪ Non-frost-susceptible fill	GP, GW, SP, SW	100% passing 1-inch sieve < 50% passing #40 sieve < 5% passing #200 sieve	< 2% OC
Pavements	Pavement fill	SP, SP-SM, SM, SC-SM, SC, CL	100% passing 3-inch sieve	< 2% OC PI < 20%
Below landscaped surfaces, where subsidence is not a concern	Non-structural fill	SP, SP-SM, SM, SC-SM, SC, CL	100% passing 6-inch sieve	< 10% OC

*More select soils comprised of coarse sands with < 5% passing #200 sieve may be needed to accommodate work occurring in periods of wet or freezing weather.

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If there is a need for some deeper soil correction work or if there is a need for large grade raises that will require more than 10 feet of compacted fill, we would recommend placing clean sand (less than 12 percent passing the #200 sieve) as structural fill at depths deeper than 10 feet. If only clay fill is used to fill house pads where more than 10 feet of fill is needed, a construction delay ranging from three to nine months may be needed, depending on the final depths of clay fill used. As an alternative, on lots where deep fills are needed, clean sand fill could be used to initially fill the excavations below these house pads. The clean sand fil should be placed in thin compacted lifts, up to an elevation of 10 feet or less from the finished basement floor grades. On-site clay fill can then be used to complete construction of the building pads. If the alternative method of filling the house pads partially with sand is used, a construction delay would not be needed. Clean sand was encountered in one boring out of 16, thus, clean sands will likely need to be imported to the site.

We recommend spreading engineered fill in loose lifts of approximately 8 to 12 inches thick. We recommend compacting each lift of fill with a full-size vibratory compactor or sheepsfoot equipment, in accordance with the criteria presented below in Table 5. The project documents should specify relative compaction of engineered fill, based on the structure located above the engineered fill, and vertical proximity to that structure.

Table 5. Compaction Recommendations Summary

Reference	Relative Compaction, percent (ASTM D698 – Standard Proctor)	Moisture Content Variance from Optimum, percentage points	
		< 12% Passing #200 Sieve (typically SP, SP-SM)	> 12% Passing #200 Sieve (typically CL, SC, SM)
Below foundations and floor slabs, less than 10 feet of fill	95	*	-1 to +3
Below foundations and floor slabs, greater than 10 feet of fill	98	*	-1 to +3
Within 3 feet of pavement subgrade	100	*	-2 to +1
More than 3 feet below pavement subgrade	95	*	-1 to +3
Below landscaped surfaces	90	*	-1 to +5

*The minimum moisture content should be no less than 5 percent by weight and no more than 3 percentage points over optimum.

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The project documents should not allow the contractor to use frozen material as engineered fill or to place engineered fill on frozen material. Frost should not penetrate under foundations during construction.

We recommend performing density tests in engineered fill to evaluate if the contractors are effectively compacting the soil and meeting project requirements.

C.3. Spread Footings

C.3.a. Embedment Depth

For frost protection, we recommend embedding perimeter footings of the proposed houses, including attached garages, a minimum of 42 inches below the lowest exterior grade. Interior footings may be placed directly below floor slabs unless they will be subjected to freezing. We recommend embedding building footings not heated during winter construction, and other unheated footings associated with decks, porches, stoops, or sidewalks at least 60 inches below the lowest exterior grade.

C.3.b. Subgrade Improvement

If a small amount of groundwater is present within the footing excavation, or if the footing subgrade soils become disturbed prior to placing forms or reinforcement, we recommend subcutting any soft or wet soil and placing a 6- to 12-inch layer of clear rock. The clear rock will provide a stable working surface and will allow for the flow of water to a drain tile or sump pump. If it is necessary to place greater than 12 inches of clear rock, the rock should be wrapped in a water permeable fabric to reduce risks of loss of fines in the rock.

C.3.c. Net Allowable Bearing Pressure

We recommend sizing spread footings to exert a net allowable bearing pressure of up to 2,000 pounds per square foot (psf). This value includes a safety factor of at least 3.0 with regard to bearing capacity failure.

C.3.d. Settlement

We estimate that total and differential settlements among the footings will amount to less than 1 and 1/2 inch, respectively, under the assumed loads. If there are areas where more than 10 feet of fill is required, higher settlements could occur, unless the deeper fill areas are only filled with poorly graded sand (SP) or poorly graded sand with silt (SP-SM) fill.

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If deep fill areas are completed using clay soil only, a construction delay may be needed to allow the fill soils to consolidate under its own weight. Construction delays could range from three to nine months, depending on the type of fill used, the compaction level obtained in the fill, and the thickness of the fill. The construction delays should be evaluated after grading is completed by using settlement plates to monitor the consolidation of the fill.

C.4. Below-Grade Walls

The following sections address soil parameters for basement wall design. Although construction of retaining walls has not been specified for this project to date, the following recommendations can also be used for preliminary retaining wall design. We recommend that additional soil borings be completed for final retaining wall design.

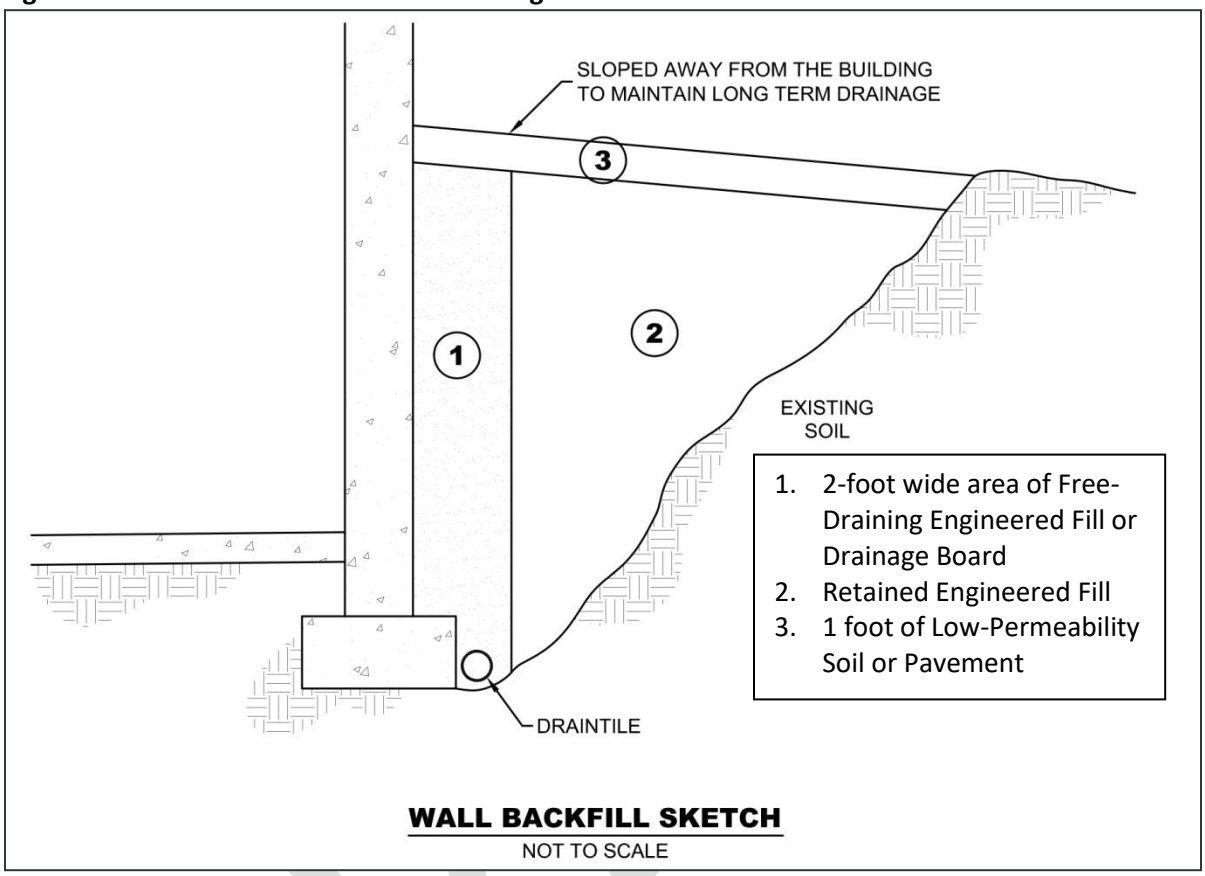
C.4.a. Drainage Control

We recommend installing drain tile to remove water behind the below-grade walls, at the location shown in Figure 3 The below-grade wall drainage system should also incorporate free-draining, engineered fill or a drainage board placed against the wall and connected to the drain tile.

Even with the use of free-draining, engineered fill, we recommend general waterproofing of below-grade walls that surround occupied or potentially occupied areas because of the potential cost impacts related to seepage after construction is complete.

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Figure 3. Generalized Illustration of Wall Engineered Fill



The materials listed in the sketch should meet the definitions in Section C.2.h. Low-permeability material is capable of directing water away from the wall, like clay, topsoil, or pavement. The project documents should indicate if the contractor should brace the walls prior to filling and allowable unbalanced fill heights.

C.4.b. Selection, Placement, and Compaction of Backfill

Unless a drainage composite is placed against the backs of the exterior perimeter basement walls, we recommend that backfill placed within 2 horizontal feet of those walls consist of sand having less than 50 percent of the particles, by weight, passing a #40 sieve and less than 5 percent of the particles, by weight, passing a #200 sieve. Sand meeting this gradation will likely need to be imported to the site.

If clay must be considered for use to make up the balance of the below-grade wall backfill (assuming a drainage composite or sand is placed against the backs of the walls), post-compaction consolidation of the clay occurring under its own weight can be expected to continue beyond the end of construction. The magnitude of consolidation could amount to between 1 and 3 percent of the backfill thickness, or wall height, and if not accommodated, could cause slabs or pavements to settle unfavorably or be damaged.

Should clay still be considered for use as backfill, however, we further recommend that:

- The bottoms of the excavations required for basement wall construction are wide enough to accommodate compaction equipment.
- Backfill is placed at moisture contents at least equal to, but not more than, 3 percentage points above its optimum moisture content.
- Backfill is placed is loose lifts no thicker than 6 inches prior to compaction.
- The relative compaction of the backfill is measured through density testing at intervals not exceeding one test per 50 horizontal feet for each 2 vertical feet of backfill placed.

We recommend using a walk-behind compactor to compact the backfill placed within about 5 feet of the basement walls. Further away than that, a self-propelled compactor can be used. Compaction criteria for basement walls should be determined based on the compaction recommendations provided above in Section C.2.

Exterior wall backfill not capped with slabs or placement should be capped with low-permeability soil to limit the infiltration of surface drainage into the backfill. The finished surface should also be sloped to divert water away from the walls.

C.4.c. Configuring and Resisting Lateral Loads

Below-grade wall design can use active earth pressure conditions if the walls can rotate slightly. If the wall design cannot tolerate rotation, then design should use at-rest earth pressure conditions. Rotation up to 0.002 times the wall height is generally required for walls supporting sand. Rotation up to 0.02 times the wall height is required when wall supports clay.

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Table 6 presents our recommended lateral coefficients and equivalent fluid pressures for wall design of active, at-rest and passive earth pressure conditions. The table also provides recommended wet unit weights and internal friction angles. Designs should also consider the slope of any engineered fill and dead or live loads placed behind the walls within a horizontal distance that is equal to the height of the walls. Our recommended values assume the wall design provides drainage so water cannot accumulate behind the walls. The construction documents should clearly identify what soils the contractor should use for engineered fill of walls.

Table 6. Recommended Below-Grade Wall Design Parameters – Drained Conditions

Retained Soil	Wet Unit Weight (pcf)	Friction Angle (degrees)	Equivalent Active Fluid Pressure (pcf)	Equivalent At-Rest Fluid Pressure (pcf)	Equivalent Passive Fluid Pressure* (pcf)
Imported sand (SP, SP-SM)	120	33	35	55	N/A
Silty sand (SM)	125	30	42	63	375
Clay (CL, SC)	130	26	50	70	330

*Based on Rankine model for soils in a region behind the wall extending at least 2 horizontal feet beyond the bottom outer edges of the wall footings and then rising up and away from the wall at an angle no steeper than 60 degrees from horizontal.

Sliding resistance between the bottom of the footing and the soil can also resist lateral pressures. We recommend assuming a sliding coefficient equal to 0.30 between the concrete and clayey soil.

The values presented in this section are un-factored.

C.5. Interior Slabs

C.5.a. Moisture Vapor Protection

Excess transmission of water vapor could cause floor dampness, certain types of floor bonding agents to separate, or mold to form under floor coverings. If project planning includes using floor coverings or coatings, we recommend placing a vapor retarder or vapor barrier immediately beneath the slab. We also recommend consulting with floor covering manufacturers regarding the appropriate type, use, and installation of the vapor retarder or barrier to preserve warranty assurances.

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C.5.b. Radon

We recommend installing a radon mitigation system in accordance with local building code. Our certified and licensed radon mitigation professionals can assist in this design at you request.

C.6. Frost Protection

C.6.a. General

Clayey soils will likely underlie all of the exterior slabs, as well as pavements. We consider clayey soils to be moderately to highly frost susceptible. Soils of this type can retain moisture and heave upon freezing. In general, this characteristic is not an issue unless these soils become saturated, due to surface runoff or infiltration, or are excessively wet in situ. Once frozen, unfavorable amounts of general and isolated heaving of the soils and the surface structures supported on them could develop. This type of heaving could affect design drainage patterns and the performance of exterior slabs and pavements, as well as any isolated exterior footings and piers.

Note that general runoff and infiltration from precipitation are not the only sources of water that can saturate subgrade soils and contribute to frost heave. Roof drainage and irrigation of landscaped areas in close proximity to exterior slabs, pavements, and isolated footings and piers, contribute as well.

C.6.b. Frost Heave Mitigation

To address most of the heave related issues, we recommend setting general site grades and grades for exterior surface features to direct surface drainage away from buildings, across large paved areas and away from walkways. Such grading will limit the potential for saturation of the subgrade and subsequent heaving. General grades should also have enough “slope” to tolerate potential larger areas of heave, which may not fully settle after thawing.

Even small amounts of frost-related differential movement at walkway joints or cracks can create tripping hazards. Project planning can explore several subgrade improvement options to address this condition.

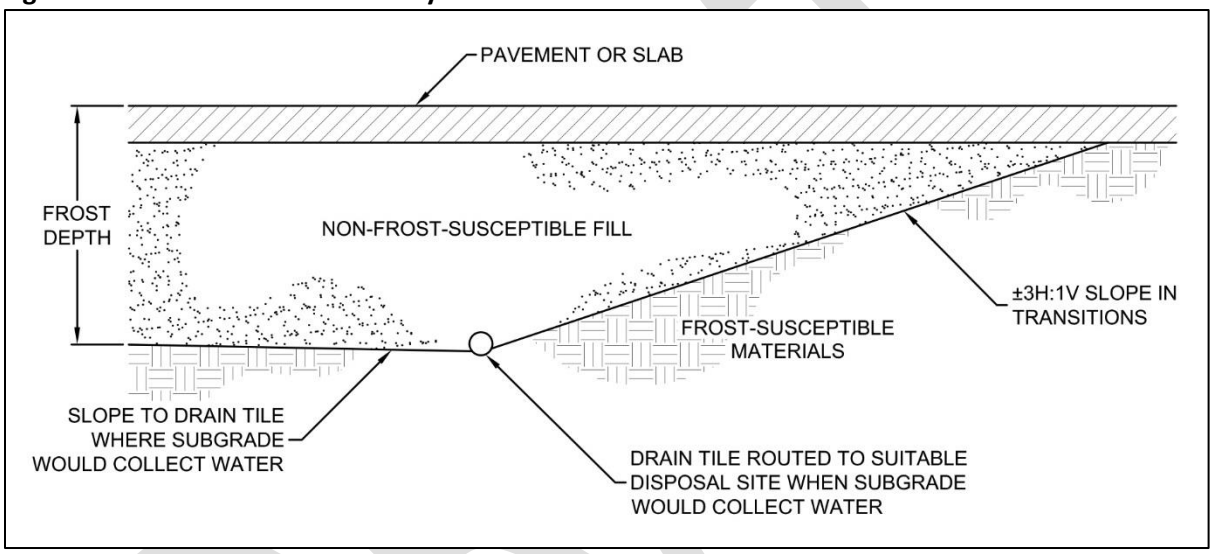
One of the more conservative subgrade improvement options to mitigate potential heave is removing any frost-susceptible soils present below the exterior slab areas down to a minimum depth of 4 feet below subgrade elevations. We recommend filling the resulting excavation with non-frost-susceptible fill. We also recommend sloping the bottom of the excavation toward one or more collection points to remove any water entering the engineered fill. This approach will not be effective in controlling frost heave without removing the water.

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An important geometric aspect of the excavation and replacement approach described above is sloping the banks of the excavations to create a more gradual transition between the unexcavated soils considered frost susceptible and the engineered fill in the excavated area, which is not frost susceptible. The slope allows attenuation of differential movement that may occur along the excavation boundary. We recommend slopes that are 3H:1V, or flatter, along transitions between frost-susceptible and non-frost-susceptible soils.

Figure 4 shows an illustration summarizing some of the recommendations.

Figure 4. Frost Protection Geometry Illustration



Another option is to limit frost heave in critical areas, such as doorways and entrances, via frost-depth footings or localized excavations with sloped transitions between frost-susceptible and non-frost-susceptible soils, as described above.

Over the life of slabs and pavements, cracks will develop, and joints will open up, which will expose the subgrade and allow water to enter from the surface and either saturate or perch atop the subgrade soils. This water intrusion increases the potential for frost heave or moisture-related distress near the crack or joint. Therefore, we recommend implementing a detailed maintenance program to seal and/or fill any cracks and joints. The maintenance program should give special attention to areas where dissimilar materials abut one another, where construction joints occur, and where shrinkage cracks develop.

C.7. Pavements and Exterior Slabs

C.7.a. Design Sections

Our scope of services for this project did not include laboratory tests on subgrade soils to determine an R-value for pavement design. Based on our experience with similar clay soils anticipated at the pavement subgrade elevation, we recommend pavement design assume an R-value of 12. Note, the contractor may need to perform limited removal of unsuitable or less suitable soils to achieve this value.

We assumed that pavements for the residential development will be subject to a minimum of 50,000 ESALs over a 20-year design life.

Based upon the aforementioned traffic loads and an R-value of 12, we recommend a bituminous pavement section that includes a minimum of 3 1/2 inches of bituminous pavement (a 1 1/2-inch surface course over a 2-inch base course) over 8 inches of aggregate base material and 18 inches of select granular borrow. The local government agency may require alternative standard pavement sections.

C.7.b. Bituminous Pavement Materials

Appropriate mix designs are critical to the performance of flexible pavements. We can provide recommendations for pavement material selection during final pavement design.

C.7.c. Subgrade Drainage

We recommend installing perorated drainpipes throughout pavement areas at low points, around catch basins, and behind curb in landscaped areas. We also recommend installing drainpipes along pavement and exterior slab edges where exterior grades promote drainage toward those edge areas. The contractor should place drainpipes in small trenches, at the base of the granular subbase layer, or below the aggregate base material where no subbase is present.

C.7.d. Performance and Maintenance

We based the above pavement designs on a 20-year performance life for bituminous. This is the amount of time before we anticipate the pavement will require reconstruction. This performance life assumes routine maintenance, such as seal coating and crack sealing. The actual pavement life will vary depending on variations in weather, traffic conditions, and maintenance. It is common to place the non-wear course of bituminous and then delay placement of wear course through a minimum of one freeze-thaw cycle.

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The ongoing performance of bituminous pavements is impacted by conditions under which the pavement is asked to perform in. These conditions include the environmental conditions, the actual use conditions, and the level of ongoing maintenance performed. Because of normal thermos-expansion and contraction, it is not unusual to have cracking develop within the first few years of placement and for the cracking to continue throughout the life of the pavement. A regular maintenance plan should be developed for filling cracks to lessen the potential impacts for cold weather distress due to frost heave or warm weather distress due to wetting and softening of the subgrade. It is also not unusual for the pavement to require a seal coat within the first 5 to 10 years to increase the long-term performance of the bituminous pavement.

C.8. Utilities

C.8.a. Subgrade Stabilization

Earthwork activities associated with utility installations located inside the building area should adhere to the recommendations in Section C.2.

For exterior utilities, we anticipate the soils at typical invert elevations will be suitable for utility support. However, if construction encounters unfavorable conditions such as soft clay, organic soils, or perched water at invert grades, the unsuitable soils may require some additional subcutting and replacement with sand or crushed rock to prepare a proper subgrade for pipe support. Project design and construction should not place utilities within the 1H:1V oversizing of foundations or proposed house pads.

C.8.b. Selection, Placement, and Compaction of Backfill

We recommend selecting, placing, and compacting utility backfill in accordance with the recommendations provided above in Section C.2.h.

C.8.c. Corrosion Potential

Based on our experience, the soils encountered by the borings are moderately corrosive to metallic conduits, but only marginally corrosive to concrete. We recommend specifying non-corrosive materials or providing corrosion protection, unless project planning chooses to perform additional tests to demonstrate the soils are not corrosive.

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C.9. Stormwater

Based on the abundance of clayey, fine-grained soils encountered within the soil borings, we do not recommend infiltration of stormwater at this site. The site soils are judged to be in the Hydrologic Soil Group D according to the Minnesota Stormwater manual. However, if a design is required, we offer the following.

If infiltration basins are proposed, we recommend field-testing of in-situ soils, such as double-ring infiltrometer tests (ASTM D3385), to determine infiltration rates. Alternatively, preliminary infiltration rates can be found in the Minnesota Stormwater Manual based on soil types.

Fine-grained soils (silts and clays), topsoil, or organic matter that mixes into or washes onto the soil will lower the permeability of an infiltration/filtration basin. The contractor should maintain and protect infiltration areas during construction. Furthermore, organic matter and silt washed into the system after construction can fill the soil pores and reduce permeability over time. Proper maintenance is important for long-term performance of infiltration/filtration systems.

This geotechnical evaluation does not constitute a review of site suitability for stormwater infiltration or evaluate the potential impacts, if any, from infiltration of large amounts of stormwater.

D. Procedures

D.1. Penetration Test Borings

We drilled the penetration test borings with an all-terrain-mounted core and auger drill equipped with hollow-stem auger. We performed the borings in general accordance with ASTM D6151 taking penetration test samples at 2 1/2- or 5-foot intervals in general accordance with ASTM D1586. The boring logs show the actual sample intervals and corresponding depths.

We sealed penetration test boreholes meeting the Minnesota Department of Health (MDH) Environmental Borehole criteria with an MDH-approved grout. We will forward a sealing record for those boreholes to the Minnesota Department of Health Well Management Section.

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D.2. Exploration Logs

D.2.a. Log of Boring Sheets

The Appendix includes Log of Boring sheets for our penetration test borings. The logs identify and describe the penetrated geologic materials and present the results of penetration resistance and other in-situ tests performed. The logs also present the results of laboratory tests performed on penetration test samples, and groundwater measurements.

We inferred strata boundaries from changes in the penetration test samples and the auger cuttings. Because we did not perform continuous sampling, the strata boundary depths are only approximate. The boundary depths likely vary away from the boring locations, and the boundaries themselves may occur as gradual rather than abrupt transitions.

D.2.b. Geologic Origins

We assigned geologic origins to the materials shown on the logs and referenced within this report, based on: (1) a review of the background information and reference documents cited above, (2) visual classification of the various geologic material samples retrieved during the course of our subsurface exploration, (3) penetration resistance and other in-situ testing performed for the project, (4) laboratory test results, and (5) available common knowledge of the geologic processes and environments that have impacted the site and surrounding area in the past.

D.3. Material Classification and Testing

D.3.a. Visual and Manual Classification

We visually and manually classified the geologic materials encountered based on ASTM D2488. When we performed laboratory classification tests, we used the results to classify the geologic materials in accordance with ASTM D2487. The Appendix includes a chart explaining the classification system we used.

D.3.b. Laboratory Testing

The exploration logs in the Appendix note most of the results of the laboratory tests performed on geologic material samples. We performed the tests in general accordance with ASTM procedures.

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D.4. Groundwater Measurements

The drillers checked for groundwater while advancing the penetration test borings, and again after auger withdrawal. We then filled the boreholes, as noted on the boring logs.

E. Qualifications

E.1. Variations in Subsurface Conditions

E.1.a. Material Strata

We developed our evaluation, analyses, and recommendations from a limited amount of site and subsurface information. It is not standard engineering practice to retrieve material samples from exploration locations continuously with depth. Therefore, we must infer strata boundaries and thicknesses to some extent. Strata boundaries may also be gradual transitions, and project planning should expect the strata to vary in depth, elevation, and thickness away from the exploration locations.

Variations in subsurface conditions present between exploration locations may not be revealed until performing additional exploration work or starting construction. If future activity for this project reveals any such variations, you should notify us so that we may reevaluate our recommendations. Such variations could increase construction costs, and we recommend including a contingency to accommodate them.

E.1.b. Groundwater Levels

We made groundwater measurements under the conditions reported herein and shown on the exploration logs and interpreted in the text of this report. Note that the observation periods were relatively short, and project planning can expect groundwater levels to fluctuate in response to rainfall, flooding, irrigation, seasonal freezing and thawing, surface drainage modifications, and other seasonal and annual factors.

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E.2. Continuity of Professional Responsibility

E.2.a. Plan Review

We based this report on a limited amount of information, and we made a number of assumptions to help us develop our recommendations. We should be retained to review the geotechnical aspects of the designs and specifications. This review will allow us to evaluate whether we anticipated the design correctly, if any design changes affect the validity of our recommendations, and if the design and specifications correctly interpret and implement our recommendations.

E.2.b. Construction Observations and Testing

We recommend retaining us to perform the required observations and testing during construction as part of the ongoing geotechnical evaluation. This will allow us to correlate the subsurface conditions exposed during construction with those encountered by the borings and provide professional continuity from the design phase to the construction phase. If we do not perform observations and testing during construction, it becomes the responsibility of others to validate the assumption made during the preparation of this report and to accept the construction-related geotechnical engineer-of-record responsibilities.

E.3. Use of Report

This report is for the exclusive use of the addressed parties. Without written approval, we assume no responsibility to other parties regarding this report. Our evaluation, analyses, and recommendations may not be appropriate for other parties or projects.

E.4. Standard of Care

In performing its services, Braun Intertec used that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession currently practicing in the same locality. No warranty, express or implied, is made.

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Appendix

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DENOTES APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING

100' 0 200'

SCALE: 1"= 200'

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Minneapolis, MN 55438
952.995.2000
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Drawing Information

Project No:	B2111878
Drawing No:	B2111878
Drawn By:	JAG
Date Drawn:	1/6/22
Checked By:	DJL
Last Modified:	1/25/22

Project Information

Nelson Site

Northeast Quadrant of Fallon Avenue NE and 85th Street NE

Monticello, Minnesota

Soil Boring Location Sketch

F:\2021\B2111878\CAD\B2111878.dwg,Geotech,1/25/2022 1:34:08 PM

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2111878
Geotechnical Evaluation
Monticello - Nelson Site
NE Quadrant of Fallon Avenue NE and 85th Street NE
Monticello, Minnesota

BORING: **ST-1**

LOCATION: See attached sketch

NORTHING: 210651 EASTING: 525280

DRILLER: M. Takada LOGGED BY: D. Leffler START DATE: 01/20/22 END DATE: 01/20/22

SURFACE ELEVATION: 958.7 ft RIG: 7507 METHOD: 3 1/4" HSA SURFACING: Open Field WEATHER: -10°, Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
957.0		LEAN CLAY with SAND (CL), dark brown, moist (TOPSOIL)					
1.7 954.7		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, stiff (GLACIAL TILL)		3-4-5 (9) 6"		16	
4.0		CLAYEY SAND (SC), trace Gravel, brownish gray, moist, stiff to very stiff (GLACIAL TILL)	5	2-7-7 (14) 7"			
				9-7-8 (15) 10"	3	13	P200=41%
			10	7-9-8 (17) 9"			
944.2				9-5-11-14 (16) 14"	3		
14.5		END OF BORING Boring then backfilled with auger cuttings	15				Water not observed while drilling.
			20				
			25				
			30				

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2111878
Geotechnical Evaluation
Monticello - Nelson Site
NE Quadrant of Fallon Avenue NE and 85th Street NE
Monticello, Minnesota

BORING: **ST-2**

LOCATION: See attached sketch

NORTHING: 210574 EASTING: 525582

DRILLER: M. Takada LOGGED BY: D. Leffler START DATE: 01/20/22 END DATE: 01/20/22

SURFACE ELEVATION: 956.1 ft RIG: 7507 METHOD: 3 1/4" HSA SURFACING: Open Field WEATHER: -10°, Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
954.4		LEAN CLAY (CL), slightly organic, black, moist (TOPSOIL)					
1.7		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, medium (GLACIAL TILL)		3-3-4 (7) 10"	1.25	23	
			5	2-4-4 (8) 12"			
949.1							
7.0		LEAN CLAY with SAND (CL), trace Gravel, brown, moist, soft to medium (GLACIAL TILL)		1-2-2 (4) 8"	0.25		
			10	2-4-4 (8) 8"			
944.1							
12.0		CLAYEY SAND (SC), trace Gravel, brown, moist, soft (GLACIAL TILL)		2-2-2-2 (4) 14"			
			15				
940.1							
16.0		POORLY GRADED SAND with SILT (SP-SM), fine to coarse-grained, brown, moist, very loose to loose (GLACIAL OUTWASH)		3-1-3 (4) 8"			
			20	5-3-5 (8) 10"			
935.1							
21.0		END OF BORING Boring then grouted					Water not observed while drilling.
			25				
			30				

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2111878
Geotechnical Evaluation
Monticello - Nelson Site
NE Quadrant of Fallon Avenue NE and 85th Street NE
Monticello, Minnesota

BORING: **ST-3**
LOCATION: See attached sketch
NORTHING: 210640 EASTING: 526006
START DATE: 01/20/22 END DATE: 01/20/22
DRILLER: M. Takada LOGGED BY: D. Leffler
SURFACE ELEVATION: 956.3 ft RIG: 7507 METHOD: 3 1/4" HSA
SURFACING: Open Field WEATHER: -10°, Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
953.8		LEAN CLAY (CL), slightly organic, black, moist (TOPSOIL)		2-2-4 (6) 6"			
2.5 950.3		SANDY LEAN CLAY (CL), trace Gravel, gray, moist, medium (ALLUVIUM)	5	3-4-3 (7) 6"		20	
6.0 947.3		LEAN CLAY with SAND (CL), brown, moist, stiff (GLACIAL TILL)		3-5-5 (10) 10"	1.75	33	P200=81%
9.0 941.8		SANDY LEAN CLAY (CL), trace Gravel, gray, moist, stiff (GLACIAL TILL) *Silty Sand seam at 10 feet*	10	3-6-9 (15) 10"			
				3-4-5-7 (9) 18"	2.5		
14.5		END OF BORING	15				Water not observed while drilling.
		Boring then backfilled with auger cuttings	20				
			25				
			30				

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2111878
Geotechnical Evaluation
Monticello - Nelson Site
NE Quadrant of Fallon Avenue NE and 85th Street NE
Monticello, Minnesota

BORING: **ST-4**

LOCATION: See attached sketch

NORTHING: 210666 EASTING: 526604

DRILLER: M. Takada LOGGED BY: D. Leffler START DATE: 01/20/22 END DATE: 01/20/22

SURFACE ELEVATION: 965.7 ft RIG: 7507 METHOD: 3 1/4" HSA SURFACING: Open Field WEATHER: -10°, Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
964.1		CLAYEY SAND (SC), dark brown, moist (TOPSOIL)					
1.6 961.7		CLAYEY SAND (SC), brown, moist, medium (ALLUVIUM)		3-2-3 (5) 2"		16	
4.0 958.7		LEAN CLAY (CL), brown, moist, stiff (ALLUVIUM)	5	3-4-5 (9) 9"	1.75	34	
7.0 953.7		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, stiff (GLACIAL TILL) *SILTY SAND layer at 7 1/2 feet*		3-5-5 (10) 7"			
			10	3-6-7 (13) 4"			
12.0 951.2		CLAYEY SAND (SC), trace Gravel, brown, moist, stiff (GLACIAL TILL)		4-4-6-8 (10) 16"	1.75		
14.5		END OF BORING Boring then backfilled with auger cuttings	15				Water not observed while drilling.
			20				
			25				
			30				

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See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2111878
Geotechnical Evaluation
Monticello - Nelson Site
NE Quadrant of Fallon Avenue NE and 85th Street NE
Monticello, Minnesota

BORING: **ST-5**

LOCATION: See attached sketch

NORTHING: 210582 EASTING: 527005

DRILLER: M. Takada LOGGED BY: D. Leffler START DATE: 01/19/22 END DATE: 01/19/22

SURFACE ELEVATION: 963.7 ft RIG: 7507 METHOD: 3 1/4" HSA SURFACING: Open Field WEATHER: -5°, Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
962.2		CLAYEY SAND (SC), dark brown, moist (TOPSOIL)					
1.5 959.7		LEAN CLAY with SAND (CL), contains seams of Poorly Graded Sand, SILT layer, brown, moist, medium (ALLUVIUM)		3-4-4 (8) 14"	2.25		
4.0 956.7		SILTY SAND (SM), fine-grained, brown and gray, moist, loose (ALLUVIUM)	5	2-3-4 (7) 6"		16	
7.0 951.7		SANDY LEAN CLAY (CL), trace Gravel, brown and gray, moist, medium to stiff (GLACIAL TILL)		2-3-4 (7) 14"		21	
			10	2-4-6 (10) 13"	1.5		
12.0 949.2		CLAYEY SAND (SC), trace Gravel, POORLY GRADED SAND layer, gray, moist, stiff (GLACIAL TILL)		2-4-7-8 (11) 16"			
14.5		END OF BORING Boring then backfilled with auger cuttings	15				Water not observed while drilling.
			20				
			25				
			30				

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2111878
Geotechnical Evaluation
Monticello - Nelson Site
NE Quadrant of Fallon Avenue NE and 85th Street NE
Monticello, Minnesota

BORING: **ST-6**

LOCATION: See attached sketch

NORTHING: 210288 EASTING: 527612

DRILLER: M. Takada LOGGED BY: D. Leffler START DATE: 01/20/22 END DATE: 01/20/22

SURFACE ELEVATION: 986.9 ft RIG: 7507 METHOD: 3 1/4" HSA SURFACING: Open Field WEATHER: -10°, Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
985.4		LEAN CLAY with SAND (CL), slightly organic, black, moist (TOPSOIL)					
1.5		SANDY LEAN CLAY (CL), trace Gravel, gray, moist, soft to medium (ALLUVIUM)		3-2-2 (4) 7"	1	20	
			5	2-3-3 (6) 13"		20	
979.9							
7.0		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, stiff (GLACIAL TILL)		6-5-4 (9) 14"	1.5		
977.9	▽						
9.0		SILTY SAND (SM), fine to medium-grained, brown, wet, loose (GLACIAL TILL)	10	3-5-5 (10) 15"			
				3-3-4-3 (7) 14"			
972.4							
14.5		END OF BORING	15				Water observed at 9.0 feet while drilling.
		Boring then backfilled with auger cuttings					
			20				
			25				
			30				

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2111878
Geotechnical Evaluation
Monticello - Nelson Site
NE Quadrant of Fallon Avenue NE and 85th Street NE
Monticello, Minnesota

BORING: **ST-7**

LOCATION: See attached sketch

NORTHING: 210663 EASTING: 527447

DRILLER: M. Takada LOGGED BY: D. Leffler START DATE: 01/19/22 END DATE: 01/19/22

SURFACE ELEVATION: 962.1 ft RIG: 7507 METHOD: 3 1/4" HSA SURFACING: Open Field WEATHER: -5°, Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
960.5		LEAN CLAY (CL), trace Gravel, dark brown, moist (TOPSOIL)					
1.6		POORLY GRADED SAND with SILT (SP-SM), fine to medium-grained, trace Gravel, Silt and Clay lenses, brown, moist, loose to medium dense (ALLUVIUM)		5-3-4 (7) 14"		7	P200=9%
956.1			5	4-6-5 (11) 13"			
6.0		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, stiff (GLACIAL TILL)		3-5-6 (11) 15"	2.25	20	
			10	3-6-7 (13) 16"			
947.6				3-6-8-9 (14) 18"	2		
14.5		END OF BORING Boring then backfilled with auger cuttings	15				Water not observed while drilling.
			20				
			25				
			30				

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2111878
Geotechnical Evaluation
Monticello - Nelson Site
NE Quadrant of Fallon Avenue NE and 85th Street NE
Monticello, Minnesota

BORING: **ST-8**
LOCATION: See attached sketch
NORTHING: 210324 EASTING: 527162
START DATE: 01/19/22 END DATE: 01/19/22
DRILLER: M. Takada LOGGED BY: D. Leffler
SURFACE ELEVATION: 964.7 ft RIG: 7507 METHOD: 3 1/4" HSA
SURFACING: Open Field WEATHER: -8°, Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
962.7		LEAN CLAY (CL), slightly organic, black, moist (TOPSOIL)					
2.0		SILTY SAND (SM), trace Gravel, ORGANIC layer, brown, moist (ALLUVIUM)		2-3-4 (7) 10"		11	
957.7			5	3-5-5 (10) 9"			
7.0		LEAN CLAY with SAND (CL), brown and gray, moist, soft to medium (ALLUVIUM)		2-2-2 (4) 14"		29	
952.7			10	2-2-4 (6) 15"			
12.0		SANDY LEAN CLAY (CL), trace Gravel, gray, moist, stiff (GLACIAL TILL)		2-6-8-7 (14) 18"	2.25		
950.2							
14.5		END OF BORING	15				Water not observed while drilling.
		Boring then backfilled with auger cuttings	20				
			25				
			30				

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2111878
Geotechnical Evaluation
Monticello - Nelson Site
NE Quadrant of Fallon Avenue NE and 85th Street NE
Monticello, Minnesota

BORING: **ST-9**

LOCATION: See attached sketch

NORTHING: 210227 EASTING: 526260

DRILLER: M. Takada LOGGED BY: D. Leffler START DATE: 01/20/22 END DATE: 01/20/22

SURFACE ELEVATION: 962.2 ft RIG: 7507 METHOD: 3 1/4" HSA SURFACING: Open Field WEATHER: -10°, Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
960.9		SANDY LEAN CLAY (CL), slightly organic, black, moist (TOPSOIL)					
1.3		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, medium to stiff (GLACIAL TILL)		3-3-3 (6) 10"	1.5		
			5	2-3-3 (6) 8"		22	
				4-5-7 (12) 12"	2.5		
			10	3-4-6 (10) 13"			
				6-7-8-8 (15) 16"	3.5		
947.7		*SILTY SAND layer at 14 feet*					
14.5		END OF BORING	15				Water not observed while drilling.
		Boring then backfilled with auger cuttings	20				
			25				
			30				

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2111878
Geotechnical Evaluation
Monticello - Nelson Site
NE Quadrant of Fallon Avenue NE and 85th Street NE
Monticello, Minnesota

BORING: **ST-10**

LOCATION: See attached sketch

NORTHING: 210209 EASTING: 525895

DRILLER: M. Takada LOGGED BY: D. Leffler START DATE: 01/20/22 END DATE: 01/20/22

SURFACE ELEVATION: 962.9 ft RIG: 7507 METHOD: 3 1/4" HSA SURFACING: Open Field WEATHER: -10°, Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
960.9		CLAYEY SAND (SC), slightly organic, black, moist (TOPSOIL)					
2.0 958.9		SILTY SAND (SM), fine to medium-grained, brown, moist, very loose (ALLUVIUM)		1-2-2 (4) 10"			
4.0 955.9		LEAN CLAY with SAND (CL), brown, moist, medium (GLACIAL TILL)	5	2-3-3 (6) 13"		23	
7.0 948.4		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, medium to stiff (GLACIAL TILL)		3-2-4 (6) 14"	2		
			10	2-5-6 (11) 13"			
				3-7-8-9 (15) 1"	3.5		
14.5		END OF BORING Boring then backfilled with auger cuttings	15				Water not observed while drilling.
			20				
			25				
			30				

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2111878
Geotechnical Evaluation
Monticello - Nelson Site
NE Quadrant of Fallon Avenue NE and 85th Street NE
Monticello, Minnesota

BORING: **ST-11**

LOCATION: See attached sketch

NORTHING: 210042 EASTING: 526657

DRILLER: M. Takada LOGGED BY: D. Leffler START DATE: 01/20/22 END DATE: 01/20/22

SURFACE ELEVATION: 970.1 ft RIG: 7507 METHOD: 3 1/4" HSA SURFACING: Open Field WEATHER: -10°, Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
968.6		CLAYEY SAND (SC), dark brown, moist (TOPSOIL)					
1.5 966.1		LEAN CLAY with SAND (CL), brown, moist, medium (GLACIAL TILL)		3-4-4 (8) 7"	1.75	23	
4.0 964.1		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, stiff (GLACIAL TILL)	5	3-4-5 (9) 6"	1.5		
6.0 961.1		LEAN CLAY (CL), brown, moist, stiff (GLACIAL TILL)		2-4-6 (10) 11"			
9.0 958.1		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, very stiff (GLACIAL TILL)	10	4-6-10 (16) 10"			
12.0 955.6		SILTY SAND (SM), fine to coarse-grained, trace Gravel, brown, moist, medium dense (GLACIAL TILL)		7-10-7-9 (17) 14"			
14.5		END OF BORING Boring then backfilled with auger cuttings	15 20 25 30				Water not observed while drilling.

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2111878
Geotechnical Evaluation
Monticello - Nelson Site
NE Quadrant of Fallon Avenue NE and 85th Street NE
Monticello, Minnesota

BORING: **ST-12**

LOCATION: See attached sketch

NORTHING: 209711 EASTING: 526115

DRILLER: M. Takada | LOGGED BY: D. Leffler | START DATE: 01/19/22 | END DATE: 01/19/22

SURFACE ELEVATION: 968.2 ft | RIG: 7507 | METHOD: 3 1/4" HSA | SURFACING: Open Field | WEATHER: -5°, Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
966.7		SILTY SAND (SM), fine to medium-grained, dark brown, moist (TOPSOIL)					
1.5		LEAN CLAY (CL), trace Gravel, brown, moist, medium (GLACIAL TILL)		2-2-4 (6) 13"		17	
964.2							
4.0		SILTY SAND (SM), fine to medium-grained, trace Gravel, brown, moist, loose (GLACIAL TILL)	5	3-2-4 (6) 12"			
961.2							
7.0		CLAYEY SAND (SC), trace Gravel, brown, moist, medium to stiff (GLACIAL TILL)		2-3-3 (6) 13"		20	
			10	3-4-5 (9) 12"			
				4-4-5-6 (9) 14"			
953.7							
14.5		END OF BORING Boring then backfilled with auger cuttings	15				Water not observed while drilling.
			20				
			25				
			30				

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2111878
Geotechnical Evaluation
Monticello - Nelson Site
NE Quadrant of Fallon Avenue NE and 85th Street NE
Monticello, Minnesota

BORING: **ST-13**
LOCATION: See attached sketch
NORTHING: 209616 EASTING: 526434
START DATE: 01/19/22 END DATE: 01/19/22
DRILLER: M. Takada LOGGED BY: D. Leffler
SURFACE ELEVATION: 977.3 ft RIG: 7507 METHOD: 3 1/4" HSA
SURFACING: Open Field WEATHER: -8°, Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
975.8		LEAN CLAY with SAND (CL), dark brown, moist (TOPSOIL)					
1.5		LEAN CLAY (CL), brown, moist, medium to stiff (GLACIAL TILL)		4-3-4 (7) 14"	1.25	27	
			5	5-5-7 (12) 13"		28	LL=35, PL=21, PI=14
970.3							
7.0		SILTY, CLAYEY SAND (SC-SM), brown, moist, medium dense (GLACIAL TILL)		4-8-10 (18) 14"			
968.3							
9.0		SANDY LEAN CLAY (CL), trace Gravel, brown, moist, stiff to very stiff (GLACIAL TILL)	10	4-6-8 (14) 13"			
				5-7-9-12 (16) 14"	3.5		
962.8							
14.5		END OF BORING	15				Water not observed while drilling.
		Boring then backfilled with auger cuttings					
			20				
			25				
			30				

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2111878
Geotechnical Evaluation
Monticello - Nelson Site
NE Quadrant of Fallon Avenue NE and 85th Street NE
Monticello, Minnesota

BORING: **ST-14**

LOCATION: See attached sketch

NORTHING: 209541 EASTING: 526973

DRILLER: M. Takada LOGGED BY: D. Leffler START DATE: 01/19/22 END DATE: 01/19/22

SURFACE ELEVATION: 975.7 ft RIG: 7507 METHOD: 3 1/4" HSA SURFACING: Open Field WEATHER: -5°, Sunny

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
974.2		SILTY SAND (SM), fine to medium-grained, dark brown, moist (TOPSOIL)					
1.5		SILTY SAND (SM), fine-grained, dark gray, moist, loose (SLOPEWASH)		2-3-4 (7) 14"		15	
971.7							
4.0		SANDY LEAN CLAY (CL), brown, moist, medium (GLACIAL TILL)	5	2-3-3 (6) 13"		21	P200=55%
				2-3-4 (7) 14"	1		
966.7							
9.0		SANDY LEAN CLAY (CL), trace Gravel, brown and gray, moist, stiff to very stiff (GLACIAL TILL)	10	4-7-8 (15) 13"			
				4-7-10-12 (17) 18"	3		
961.2							
14.5		END OF BORING	15				
		Boring then backfilled with auger cuttings					
			20				
			25				
			30				

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2111878
Geotechnical Evaluation
Monticello - Nelson Site
NE Quadrant of Fallon Avenue NE and 85th Street NE
Monticello, Minnesota

BORING: **ST-15**
LOCATION: See attached sketch
NORTHING: 209808 EASTING: 527129
START DATE: 01/19/22 END DATE: 01/19/22
SURFACE ELEVATION: 974.7 ft RIG: 7507 METHOD: 3 1/4" HSA
SURFACING: Open Field WEATHER: -5°, Sunny
DRILLER: M. Takada LOGGED BY: D. Leffler

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
973.0		SILTY SAND (SM), fine-grained, slightly organic, black, moist (TOPSOIL)					
1.7		LEAN CLAY with SAND (CL), trace Gravel, brown, moist, medium (GLACIAL TILL)		2-3-3 (6) 13"			
			5	2-2-3 (5) 12"		25	
967.7							
7.0		SANDY LEAN CLAY (CL), trace Gravel, brown and gray, moist, stiff to very stiff (GLACIAL TILL)		3-5-6 (11) 14"	2.75	25	
			10	4-4-8 (12) 13"			
				3-6-11-11 (17) 14"	3.5		
960.2							
14.5		END OF BORING Boring then backfilled with auger cuttings	15				Water not observed while drilling.
			20				
			25				
			30				

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2111878
Geotechnical Evaluation
Monticello - Nelson Site
NE Quadrant of Fallon Avenue NE and 85th Street NE
Monticello, Minnesota

BORING: **ST-16**
LOCATION: See attached sketch
NORTHING: 209685 EASTING: 527510
START DATE: 01/19/22 END DATE: 01/19/22
SURFACE ELEVATION: 999.3 ft RIG: 7507 METHOD: 3 1/4" HSA
SURFACING: Open Field WEATHER: -5°, Sunny
DRILLER: M. Takada LOGGED BY: D. Leffler

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
997.8		LEAN CLAY (CL), dark brown, moist (TOPSOIL)					
1.5		LEAN CLAY (CL), trace Gravel, brown, moist, medium to stiff (GLACIAL TILL)		2-3-3 (6) 14"		31	
			5	3-4-5 (9) 13"	1.5		
992.3							
7.0		SANDY LEAN CLAY (CL), trace Gravel, brown and gray, moist, stiff (GLACIAL TILL)		4-4-6 (10) 12"			
			10	4-5-7 (12) 15"			
				2-6-8-13 (14) 16"	3		
984.8							
14.5		END OF BORING Boring then backfilled with auger cuttings	15				Water not observed while drilling.
			20				
			25				
			30				

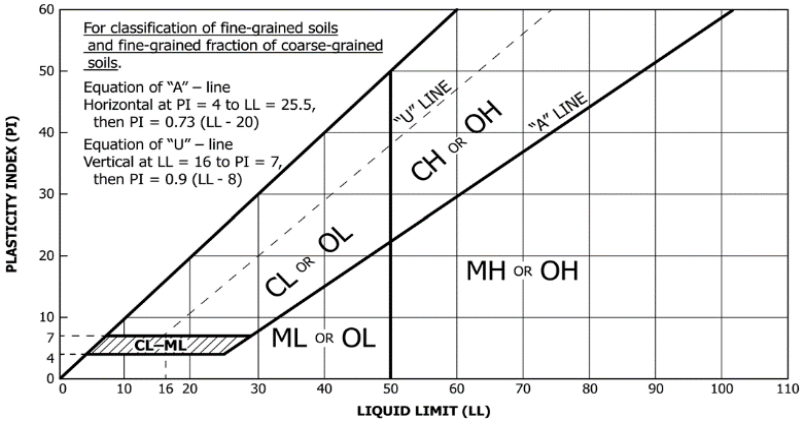
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Descriptive Terminology of Soil

Based on Standards ASTM D2487/2488
(Unified Soil Classification System)

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]				Soil Classification	
				Group Symbol	Group Name[B]
Coarse-grained Soils (more than 50% retained on No. 200 sieve)	Gravels (More than 50% of coarse fraction retained on No. 4 sieve)	Clean Gravels (Less than 5% fines[C])	$C_u \geq 4$ and $1 \leq C_c \leq 3$[D]	GW	Well-graded gravel[E]
			$C_u < 4$ and/or ($C_c < 1$ or $C_c > 3$)[D]	GP	Poorly graded gravel[E]
		Gravels with Fines (More than 12% fines[C])	Fines classify as ML or MH	GM	Silty gravel[E F G]
			Fines Classify as CL or CH	GC	Clayey gravel[E F G]
	Sands (50% or more coarse fraction passes No. 4 sieve)	Clean Sands (Less than 5% fines[H])	$C_u \geq 6$ and $1 \leq C_c \leq 3$[D]	SW	Well-graded sand[I]
			$C_u < 6$ and/or ($C_c < 1$ or $C_c > 3$)[D]	SP	Poorly graded sand[I]
		Sands with Fines (More than 12% fines[H])	Fines classify as ML or MH	SM	Silty sand[F G I]
			Fines classify as CL or CH	SC	Clayey sand[F G I]
Fine-grained Soils (50% or more passes the No. 200 sieve)	Silts and Clays (Liquid limit less than 50)	Inorganic	PI > 7 and plots on or above "A" line[J]	CL	Lean clay[K L M]
			PI < 4 or plots below "A" line[J]	ML	Silt[K L M]
		Organic	Liquid Limit – oven dried / Liquid Limit – not dried <0.75	OL	Organic clay[K L M N] / Organic silt[K L M O]
	Silts and Clays (Liquid limit 50 or more)	Inorganic	PI plots on or above "A" line	CH	Fat clay[K L M]
			PI plots below "A" line	MH	Elastic silt[K L M]
		Organic	Liquid Limit – oven dried / Liquid Limit – not dried <0.75	OH	Organic clay[K L M P] / Organic silt[K L M Q]
Highly Organic Soils		Primarily organic matter, dark in color, and organic odor		PT	Peat

A. Based on the material passing the 3-inch (75-mm) sieve.
B. If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
C. Gravels with 5 to 12% fines require dual symbols:
   GW-GM well-graded gravel with silt
   GW-GC well-graded gravel with clay
   GP-GM poorly graded gravel with silt
   GP-GC poorly graded gravel with clay
D. $C_u = D_{60} / D_{10}$ $C_c = (D_{30})^2 / (D_{10} \times D_{60})$
E. If soil contains ≥ 15% sand, add "with sand" to group name.
F. If fines classify as CL-ML, use dual symbol GC-GM or SC-SM.
G. If fines are organic, add "with organic fines" to group name.
H. Sands with 5 to 12% fines require dual symbols:
   SW-SM well-graded sand with silt
   SW-SC well-graded sand with clay
   SP-SM poorly graded sand with silt
   SP-SC poorly graded sand with clay
I. If soil contains ≥ 15% gravel, add "with gravel" to group name.
J. If Atterberg limits plot in hatched area, soil is CL-ML, silty clay.
K. If soil contains 15 to < 30% plus No. 200, add "with sand" or "with gravel", whichever is predominant.
L. If soil contains ≥ 30% plus No. 200, predominantly sand, add "sandy" to group name.
M. If soil contains ≥ 30% plus No. 200 predominantly gravel, add "gravelly" to group name.
N. PI ≥ 4 and plots on or above "A" line.
O. PI < 4 or plots below "A" line.
P. PI plots on or above "A" line.
Q. PI plots below "A" line.



Laboratory Tests

DD	Dry density, pcf	**q_p**	Pocket penetrometer strength, tsf
WD	Wet density, pcf	**q_U**	Unconfined compression test, tsf
P200	% Passing #200 sieve	**LL**	Liquid limit
MC	Moisture content, %	**PL**	Plastic limit
OC	Organic content, %	**PI**	Plasticity index

Particle Size Identification

Boulders..... over 12"
Cobbles..... 3" to 12"
Gravel
  Coarse..... 3/4" to 3" (19.00 mm to 75.00 mm)
  Fine..... No. 4 to 3/4" (4.75 mm to 19.00 mm)
Sand
  Coarse..... No. 10 to No. 4 (2.00 mm to 4.75 mm)
  Medium..... No. 40 to No. 10 (0.425 mm to 2.00 mm)
  Fine..... No. 200 to No. 40 (0.075 mm to 0.425 mm)
Silt..... No. 200 (0.075 mm) to .005 mm
Clay..... < .005 mm

Relative Proportions[L, M]

trace..... 0 to 5%
little..... 6 to 14%
with..... ≥ 15%

Inclusion Thicknesses

lens..... 0 to 1/8"
seam..... 1/8" to 1"
layer..... over 1"

Apparent Relative Density of Cohesionless Soils

Very loose ..... 0 to 4 BPF
Loose ..... 5 to 10 BPF
Medium dense..... 11 to 30 BPF
Dense..... 31 to 50 BPF
Very dense..... over 50 BPF

Consistency of Cohesive Soils	Blows Per Foot	Approximate Unconfined Compressive Strength
Very soft	0 to 1 BPF	< 0.25 tsf
Soft	2 to 4 BPF	0.25 to 0.5 tsf
Medium	5 to 8 BPF	0.5 to 1 tsf
Stiff	9 to 15 BPF	1 to 2 tsf
Very Stiff	16 to 30 BPF	2 to 4 tsf
Hard	over 30 BPF	> 4 tsf

Moisture Content:

Dry: Absence of moisture, dusty, dry to the touch.
Moist: Damp but no visible water.
Wet: Visible free water, usually soil is below water table.

Drilling Notes:

Blows/N-value: Blows indicate the driving resistance recorded for each 6-inch interval. The reported N-value is the blows per foot recorded by summing the second and third interval in accordance with the Standard Penetration Test, ASTM D1586.

Partial Penetration: If the sampler could not be driven through a full 6-inch interval, the number of blows for that partial penetration is shown as #/x" (i.e. 50/2"). The N-value is reported as "REF" indicating refusal.

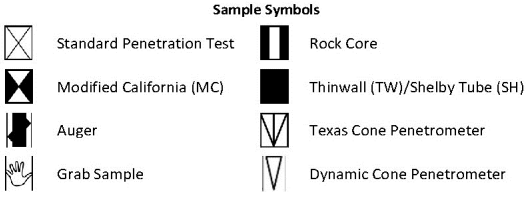
Recovery: Indicates the inches of sample recovered from the sampled interval. For a standard penetration test, full recovery is 18", and is 24" for a thinwall/shelby tube sample.

WOH: Indicates the sampler penetrated soil under weight of hammer and rods alone; driving not required.

WOR: Indicates the sampler penetrated soil under weight of rods alone; hammer weight and driving not required.

Water Level: Indicates the water level measured by the drillers either while drilling (▽), at the end of drilling (▼), or at some time after drilling (▼).

Sample Symbols



5/2021

BOARD OF WATER AND SOIL RESOURCES

Minnesota Wetland Conservation Act
Notice of Decision

Local Government Unit: Wright SWCD	**County:** Wright
Applicant Name: David and Judy Nelson Kyle Cameron, Kjolhaug Env. Services	**Applicant Representative:**
Project Name: 5106 85th Street NE Monticello	**LGU Project No. (if any):**
Date Complete Application Received by LGU: 11-5-21	
Date of LGU Decision: 11-30-21	
Date this Notice was Sent: 11-30-21	

WCA Decision Type - check all that apply

☒ Wetland Boundary/Type ☐ Sequencing ☐ Replacement Plan ☐ Bank Plan (not credit purchase)
☐ No-Loss (8420.0415) ☐ Exemption (8420.0420)
Part: ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G ☐ H Subpart: ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

Replacement Plan Impacts (replacement plan decisions only)

Total WCA Wetland Impact Area:
Wetland Replacement Type: ☐ Project Specific Credits: ☐ Bank Credits:
Bank Account Number(s):

Technical Evaluation Panel Findings and Recommendations (attach if any)

☐ Approve ☐ Approve w/Conditions ☐ Deny ☒ No TEP Recommendation

LGU Decision

☐ Approved with Conditions (specify below)[1] ☒ Approved[1] ☐ Denied
List Conditions:

Decision-Maker for this Application: ☒ Staff ☐ Governing Board/Council ☐ Other:

Decision is valid for: ☒ 5 years (default) ☐ Other (specify):

[1] *Wetland Replacement Plan approval is not valid until BWSR confirms the withdrawal of any required wetland bank credits. For project-specific replacement a financial assurance per MN Rule 8420.0522, Subp. 9 and evidence that all required forms have been recorded on the title of the property on which the replacement wetland is located must be provided to the LGU for the approval to be valid.*

LGU Findings – Attach document(s) and/or insert narrative providing the basis for the LGU decision[1].

☒ Attachment(s) (specify): **Wetland Boundary Figure**
☒ Summary: The LGU conducted a site visit on 11-8-21 to review the wetland boundary described within the application. The LGU concurs with the wetland boundary/type as shown on the attached figure and described within the application.

[1] *Findings must consider any TEP recommendations.*

Attached Project Documents

☒ Site Location Map ☒ Project Plan(s)/Descriptions/Reports (specify): **Wetland Boundary Figure**

Appeals of LGU Decisions

If you wish to appeal this decision, you must provide a written request within 30 calendar days of the date you received the notice. All appeals must be submitted to the Board of Water and Soil Resources Executive Director along with a check payable to BWSR for $500 *unless* the LGU has adopted a local appeal process as identified below. The check must be sent by mail and the written request to appeal can be submitted by mail or e-mail. The appeal should include a copy of this notice, name and contact information of appellant(s) and their representatives (if applicable), a statement clarifying the intent to appeal and supporting information as to why the decision is in error. Send to:

Appeals & Regulatory Compliance Coordinator
Minnesota Board of Water & Soils Resources
520 Lafayette Road North
St. Paul, MN 55155
travis.germundson@state.mn.us

Does the LGU have a local appeal process applicable to this decision?

☐ Yes[1] ☒ No

[1]*If yes, all appeals must first be considered via the local appeals process.*

Local Appeals Submittal Requirements (LGU must describe how to appeal, submittal requirements, fees, etc. as applicable)

Notice Distribution (include name)

Required on all notices:

☒ SWCD & LGU TEP Member: Andrew Grean – andrew.grean@usda.gov ☒ BWSR TEP Member: Cade Steffenson – cade.steffenson@state.mn.us
☒ Wright County Delegated TEP Member: Jeremy Carlson - jeremy.carlson@co.wright.mn.us
☒ DNR Representative: James Bedell – james.bedell@state.mn.us
☐ Watershed District or Watershed Mgmt. Org.:
☒ Applicant: David and Judy Nelson, 5106 85th Street NE Monticello MN 55362 ☒ Agent/Consultant: Kyle Cameron, kyle@kjolhaugenv.com

Optional or As Applicable:

☒ Corps of Engineers: usace_requests_mn_usace.army.mil
☐ BWSR Wetland Mitigation Coordinator (required for bank plan applications only):
☒ Members of the Public (notice only): Frank Svoboda - fjsvoboda@gmail.co, ☒ Other: Scott Glup, USFWS – scott_glup@fws.gov Jeremy Donabauer, jeremydonabauer@hotmail.com

Signature: 	**Date:** November 30, 2021

This notice and accompanying application materials may be sent electronically or by mail. The LGU may opt to send a summary of the application to members of the public upon request per 8420.0255, Subp. 3.



Figure 1 - Site Location Map

N

0 1,000 Feet

Site Boundary

KJOLHAUG ENVIRONMENTAL SERVICES COMPANY

Source: ESRI Streets Basemap

5106 85th ST NE (KES 2021-129)
Monticello, Minnesota

Note: Boundaries indicated on this figure are approximate and do not constitute an official survey product.

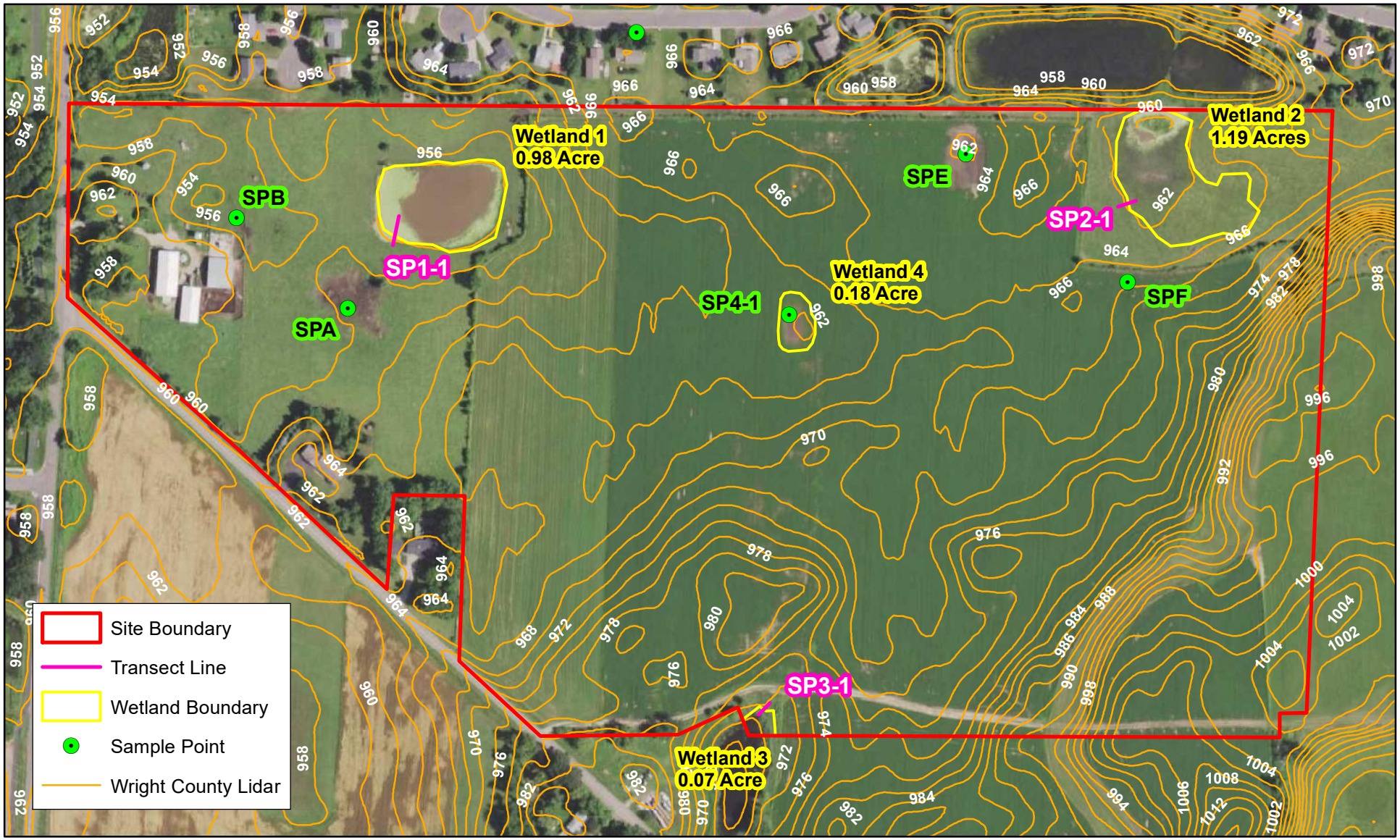


Figure 2 - Existing Conditions

N

0 290 Feet

KJOLHAUG ENVIRONMENTAL SERVICES COMPANY

Source: MNGEO Spatial Commons

5106 85th ST NE (KES 2021-129)
Monticello, Minnesota

Note: Boundaries indicated on this figure are approximate and do not constitute an official survey product.

DRAFT REPORT

To: Reid Schultz, Development Manager
Tamarack Land Development

From: Matt Pacyna, PE, Principal
Transportation Collaborative & Consultants, LLC

Date: February 13, 2025

Subject: Meadows at Pioneer Park Development Traffic Study, Monticello, MN

INTRODUCTION

TC2 completed a traffic study for the proposed Meadows at Pioneer Park residential development in Monticello, MN. The site under consideration, shown in Figure 1, is generally bounded by Fallon Avenue to the west, Mallard Lane to the north, Fenning Avenue (CR 118) to the east, and 85th Street to the south. The main objectives of the study are to quantify existing traffic operations within the study area, evaluate potential impacts of the proposed development, and recommend improvements, if necessary, to ensure safe and efficient operations for all users. The following study assumptions, methodology, and findings are offered for consideration.

Figure 1 Subject Site



EXISTING CONDITIONS

Existing conditions were reviewed within the study area to establish current traffic conditions to help determine impacts associated with the proposed development. The evaluation of existing conditions included collecting traffic volumes, observing transportation characteristics, and analyzing crash history and intersection capacity, which are described in the following sections.

Traffic Volumes

Vehicular intersection turning movement counts were collected at the following locations on Wednesday, December 18, 2024. The counts were generally collected from 7 to 9 a.m. and 4 to 6 p.m. at each study intersection except a 13-hour count (i.e., 6 a.m. to 7 p.m.) was collected at the Fallon Avenue and School Boulevard intersection. Traffic volumes were estimated at the Fallon Avenue / Fallon Drive and Mallard Lane / Tanager Circle intersections based on adjacent land use and intersection travel patterns.

- Fallon Avenue and School Boulevard
- Fallon Avenue and Starling Drive
- Fallon Avenue and 85th Street
- School Boulevard and Pelican Lane
- Fenning Avenue (CR 18 / 118) and School Boulevard / CR 18
- Fenning Avenue (CR 118) and 85th Street

The a.m. and p.m. peak hours represent 7:15 to 8:15 a.m. and 4:45 to 5:45 p.m., respectively. Average daily traffic (ADT) volumes were provided by MnDOT or estimated based on the data collected.

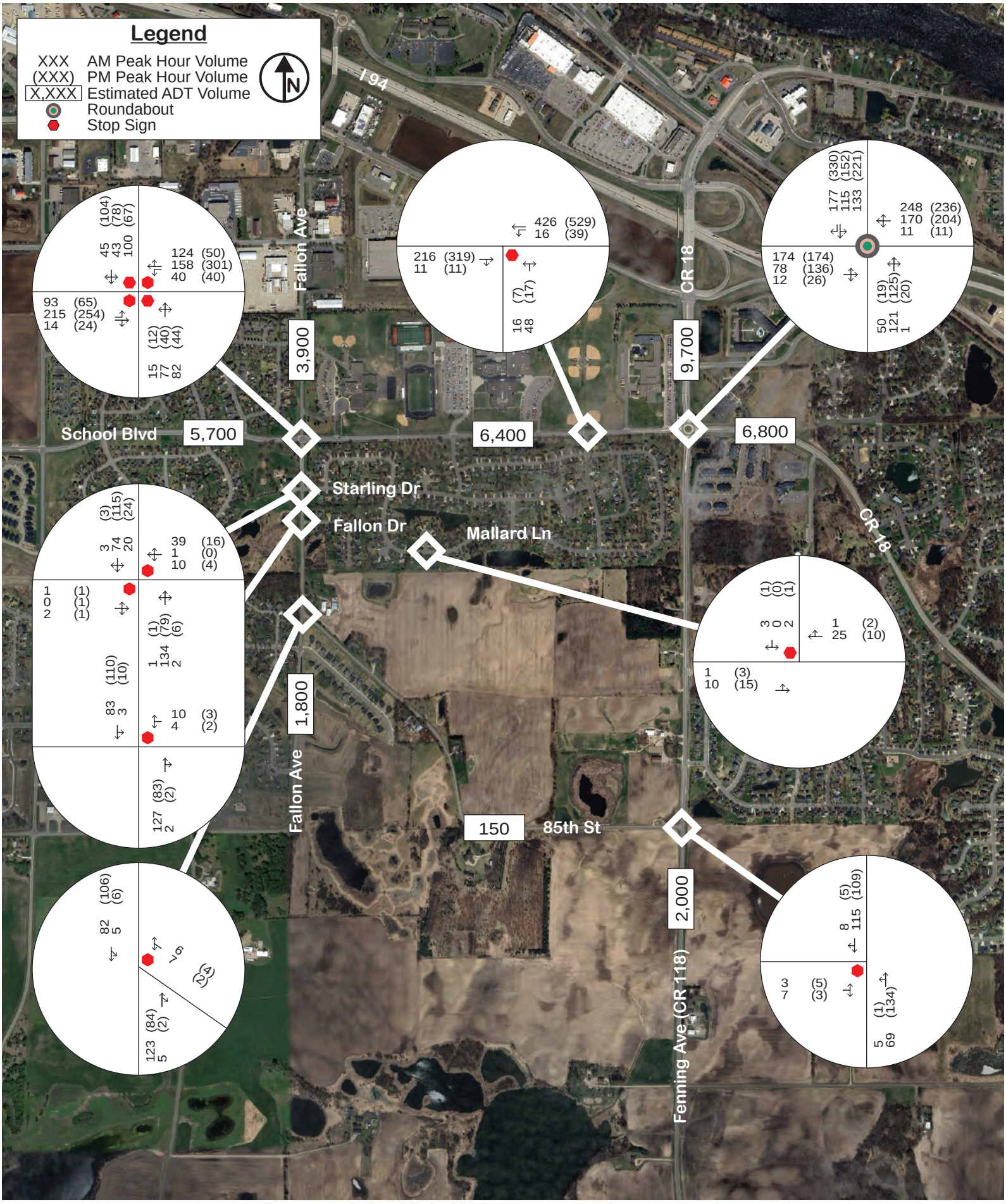
Transportation Characteristics

Observations were conducted within the study area to identify various transportation characteristics such as roadway geometry, traffic controls, speed limits, and multimodal facilities. A general overview of key roadways within the study area is as follows:

- ***School Boulevard*** – a 3-lane undivided minor arterial roadway with a center two-way left turn lane. There is a multiuse trail along both sides of the roadway, except for a gap on the south side from about 1,000 feet east of Fallon Avenue to Fenning Avenue (CR 18 / CR 118). The speed limit is 40 mph, but there is a 30-mph school speed zone.
- ***CR 18*** – a major collector roadway that varies from a 2-lane undivided facility with select turn / bypass lanes east of the School Boulevard roundabout to a 4-lane divided facility to the north. There is a multiuse trail along both sides of the roadway within the study area; the speed limit is 40 mph.
- ***Fenning Avenue (CR 118)*** – a 2-lane undivided minor collector roadway with periodic left and right turn lanes at key intersections, as well as a short segment with a center two-way left turn lane. There is a multiuse trail along the east side of the roadway north of 85th Street; the speed limit is 45 mph.
- ***Fallon Avenue*** – a 2-lane undivided local roadway with no turn lanes. There is a multiuse trail along the west side of the roadway between School Boulevard and 87th Street, as well as a short multiuse trail segment on the east side south of 85th Street; the speed limit is 30 mph.

All other study roadways are 2-lane undivided local facilities with limited turn lanes or multimodal facilities. The Fenning Avenue (CR 18 / 118) and School Boulevard intersection is roundabout controlled and the Fallon Avenue and School Boulevard intersection is all-way stop controlled; all other study intersections have two-way stop control. Existing conditions are illustrated in Figure 2.

DRAFT



Existing Conditions

Meadows at Pioneer Park Development Traffic Study

Figure 2

Crash History

Five years of crash history within the study area (January 2020 through December 2024) was reviewed using data from *MnDOT's Crash Mapping Analysis Tool* (MnCMAT). There was a total of 13 intersection-related crashes and zero (0) severe crashes (defined as a fatal or serious injury) during the analysis period at the study intersections. Most of the reported crashes occurred at the Fenning Avenue (CR 18 / 118) and School Boulevard intersection, which had eight (8) reported crashes. Note that this intersection was reconstructed to a roundabout in 2021; following construction, there has been an average of two (2) crashes per year. No other study intersection had more than three (3) reported crashes within the review period. A summary of the intersection crash analysis is shown in Table 1.

To help understand the significance of the frequency or severity of crashes within the study area, actual crash and severity rates were calculated and compared to critical crash and severity rates for intersections with similar characteristics. This approach was used to determine the statistical significance of the amount and severity of the crashes that have occurred. A crash or severity rate above the critical rate (i.e., a critical index > 1.0) indicates an intersection that operates outside of the normal range that should be investigated further to determine if there are any engineering solutions to address the statistically significant crash issue. Based on the crash analysis, there are no study intersections with a crash or severity rate above the critical crash rate. Thus, there does not appear to be any significant safety issues within the study area from a crash history perspective.

Table 1 Intersection Crash Analysis

Intersection	Crashes All / K-A	Actual / Critical / Index					
		Crash Rates			Severity Rates		
Fallon Ave and School Blvd	3 / 0	0.18	0.69	0.26	0.00	5.55	0.00
Fallon Ave and Starling Dr	1 / 0	0.24	0.73	0.32	0.00	16.0	0.00
Fallon Ave and Fallon Dr	0 / 0	0.00	0.81	0.00	0.00	18.8	0.00
Fallon Ave and 85th St	1 / 0	0.30	0.82	0.36	0.00	22.5	0.00
School Blvd and Pelican Ln	0 / 0	0.00	0.45	0.00	0.00	6.46	0.00
Fenning Ave (CR 18/118) and School Blvd	8 / 0	0.34	1.52	0.22	0.00	4.37	0.00
Fenning Ave (CR 118) and 85th St	0 / 0	0.00	0.77	0.00	0.00	20.7	0.00

K – represents a fatal crash A – represents a serious injury crash

Intersection Capacity

Intersection capacity was evaluated using Synchro / SimTraffic Software (version 11), which uses methods outlined in the *Highway Capacity Manual, 6th Edition*. The software is used to develop calibrated models that simulate observed traffic operations and identify key metrics such as intersection Level of Service (LOS) and queues. These models incorporate collected traffic, pedestrian, and bicyclist volumes, traffic controls, peaking characteristics, and driver behavior factors. Level of Service (LOS) quantifies how an intersection is operating. Intersections are graded from LOS A to LOS F, which corresponds to the average delay per vehicle values shown. An overall intersection LOS A though LOS D is generally considered acceptable in the study area. LOS A indicates the best traffic operation, while LOS F indicates an intersection where demand exceeds capacity.

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Level of Service	Average Delay / Vehicles	
	Stop, Yield, and Roundabout	Signalized
A	< 10 seconds	< 10 seconds
B	10 to 15 seconds	10 to 20 seconds
C	15 to 25 seconds	20 to 35 seconds
D	25 to 35 seconds	35 to 55 seconds
E	35 to 50 seconds	55 to 80 seconds
F	> 50 seconds	> 80 seconds

For side-street stop-controlled intersections, special emphasis is given to providing an estimate for the level of service of the side-street approach. Traffic operations at an unsignalized intersection with side-street stop control can be described in two ways. First, consideration is given to the overall intersection level of service, which takes into account the total number of vehicles entering the intersection and the capability of the intersection to support the volumes. Second, it is important to consider the delay on the minor approach. Since the mainline does not have to stop, most delay is attributed to the side-street approaches. It is typical of intersections with higher mainline traffic volumes to experience high-levels of delay (i.e., poor levels of service) on the side-street approaches, but an acceptable overall intersection level of service during peak hour conditions.

The existing intersection capacity analysis results, summarized in Table 2, indicate that all study intersections and approaches currently operate at an acceptable LOS B or better during the typical weekday a.m. and p.m. peak hours. There is some minor queuing (i.e., 4 to 8 vehicles) that occurs at the Fallon Avenue and School Boulevard intersection during the peak hours; these queues primarily occur around school arrival / departure periods and quickly dissipate within approximately 15-minutes. There is also some minor queuing (i.e., 6 to 10 vehicles) that occurs at the Fenning Avenue (CR 18 / 118) and School Boulevard intersection during the peak periods; most queuing at this intersection occur in the southbound and westbound directions and also dissipate relatively quickly. Thus, there are currently no significant intersection capacity issues within the study area.

Table 2 Existing Intersection Capacity

Intersection	Traffic Control	Level of Service (Delay)	
		AM Peak Hour	PM Peak Hour
Fallon Ave and School Blvd	AWSC	A (9 sec)	A (9 sec)
Fallon Ave and Starling Dr	SSS	A / A (4 sec)	A / A (4 sec)
Fallon Ave and Fallon Dr	SSS	A / A (4 sec)	A / A (4 sec)
Fallon Ave and 85th St	SSS	A / A (2 sec)	A / A (2 sec)
Mallard Ln and Tanager Cr	SSS	A / A (6 sec)	A / A (4 sec)
School Blvd and Pelican Ln	SSS	A / A (5 sec)	A / A (6 sec)
Fenning Ave (CR 18 / 118) and School Blvd	RAB	A (7 sec)	A (8 sec)
Fenning Ave (CR 118) and 85th St	SSS	A / A (2 sec)	A / A (3 sec)

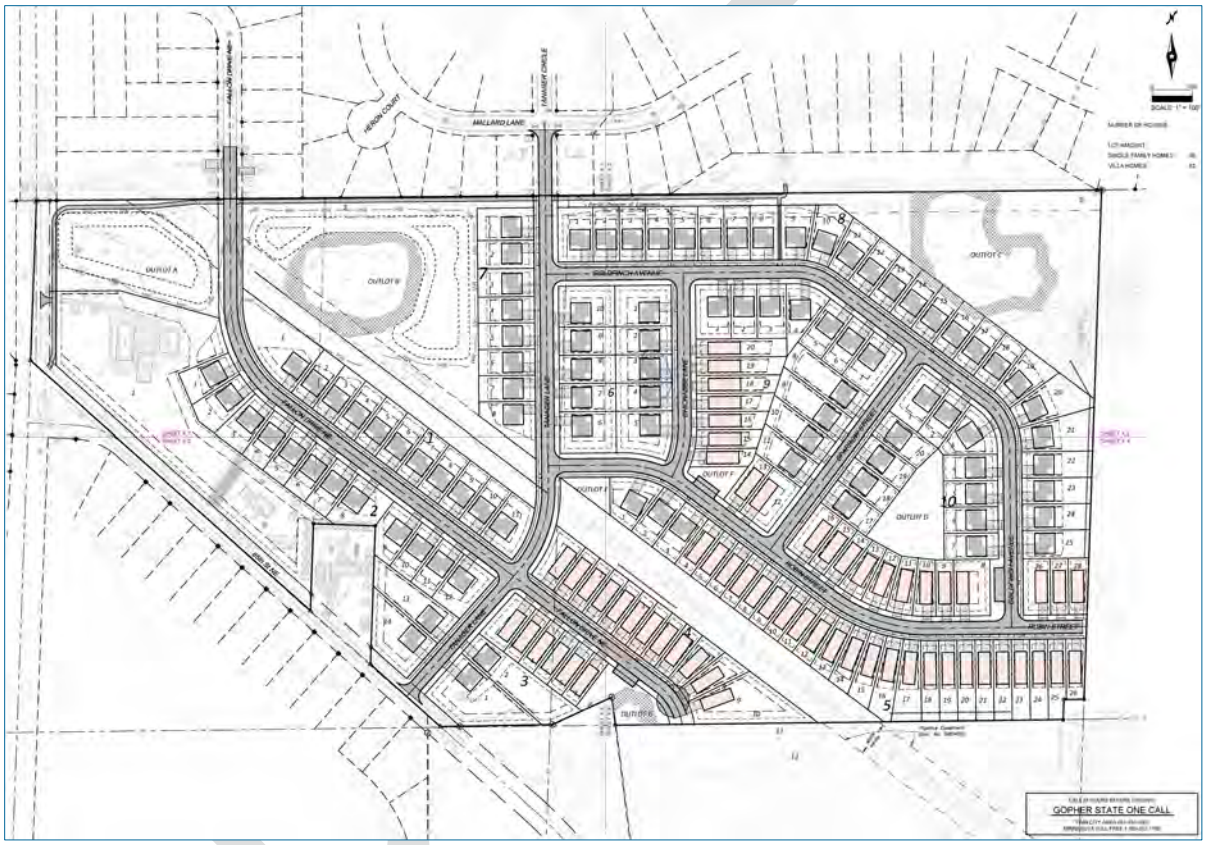
AWSC – All Way Stop Control *SSS – Side-Street-Stop* *RAB - Roundabout*

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PROPOSED DEVELOPMENT

The proposed development, which is shown in Figure 3, is generally bounded by Fallon Avenue to the west, Mallard Lane to the north, Fenning Avenue (CR 118) to the east, and 85th Street to the south. As proposed, the project would include a total of 157 single-family residential homes. Three (3) access locations are planned for the project, with connections to Fallon Drive, Mallard Lane, and 85th Street. The new 85th Street access is located approximately ¼-mile east of Fallon Avenue. Note that Robin Street within the development is planned to allow for future east-west connectivity to potential future adjacent development. Sidewalk is proposed throughout the site along one side of each roadway and includes connections to adjacent facilities. Construction was assumed to be fully completed by 2029.

Figure 3 Proposed Site Plan



TRAFFIC FORECASTS

Traffic forecasts were developed for year 2030 conditions, which represents one-year after completion. The traffic forecasts account for general background growth and trip generation from the proposed development. The following information summarizes the traffic forecast development process.

Background Growth

To account for general background growth in the study area, an annual growth rate of three (3) percent was applied to the existing traffic volumes to develop year 2030 background traffic forecasts. This growth rate is consistent with historical ADT volumes over the last 20-years, as well as future year 2040 traffic forecasts within the *Wright County Long Range Transportation Plan*.

Proposed Development Trip Generation

The trip generation estimate for the proposed development was created using the *ITE Trip Generation Manual, 11th Edition* and includes trips for typical weekday a.m. and p.m. peak hours, as well as daily. The proposed development, shown in Table 3, is estimated to generate 112 a.m. peak hour (28 in / 84 out), 152 p.m. peak hour (96 in / 56 out), and 1,528 daily trips. No modal reductions were applied to provide a more conservative estimate.

Table 3 Trip Generation Summary

Land Use Type *(ITE Code)*	Size	AM Peak Hour		PM Peak Hour		Daily
		In	Out	In	Out	
Single-Family Residential *(210)*	157 homes	28	84	96	56	1,528

Site generated trips were distributed throughout the study area using the directional distribution shown in Figure 4, which is based on a combination of existing area travel patterns and engineering judgment. The resultant year 2027 build condition traffic forecasts are illustrated in Figure 5.

YEAR 2030 CONDITIONS

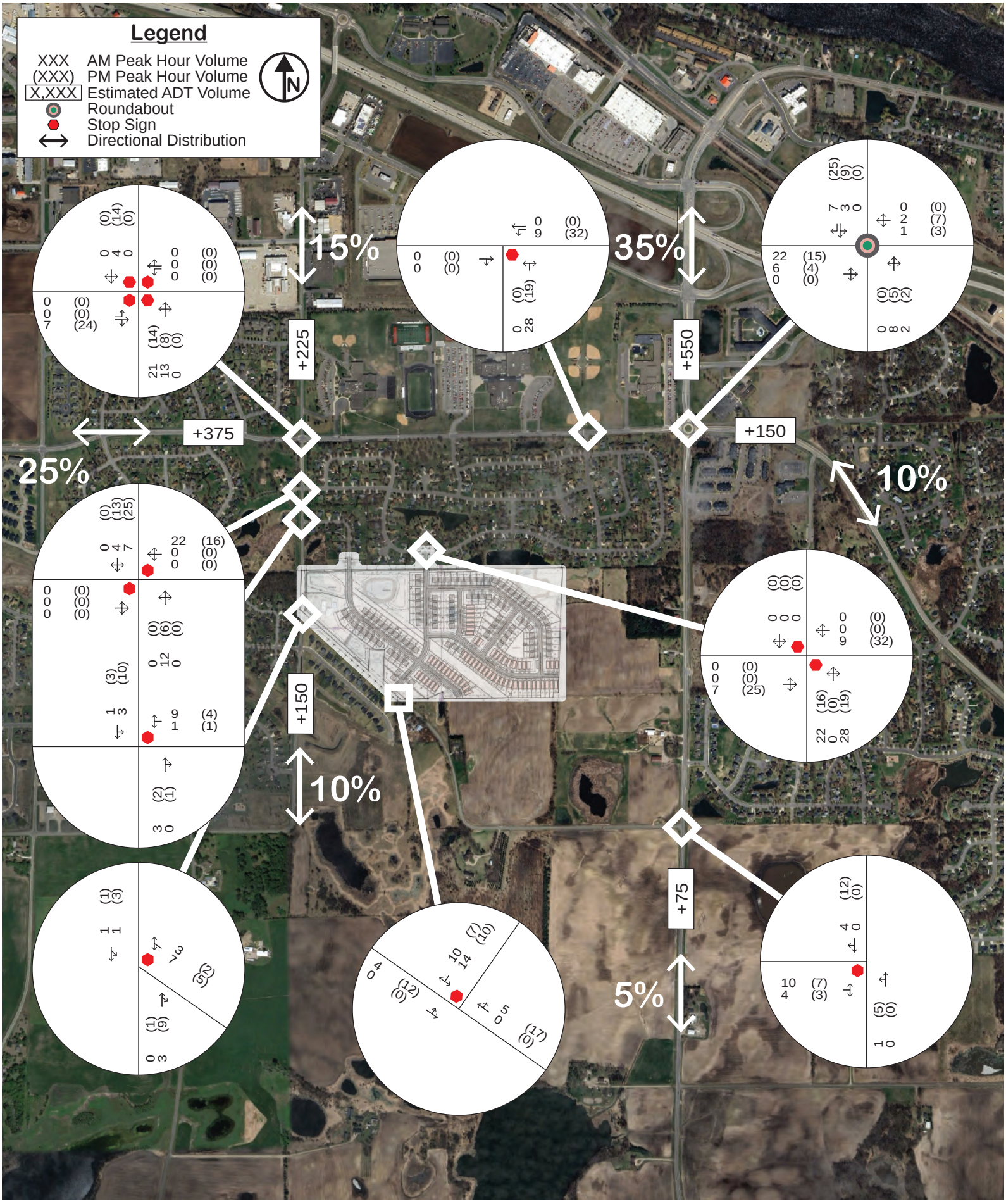
To understand impacts associated with the proposed development, a year 2030 build condition intersection capacity analysis was conducted. Results of the future analysis shown Table 4 indicate that all study intersections and approaches are expected to operate at an acceptable LOS C or better during the typical weekday a.m. and p.m. peak hours. Most approach queues are anticipated to increase by one (1) to two (2) vehicles under future year 2030 conditions, except the westbound approach at the Fenning Avenue (CR 18 / 118) and School Boulevard intersection during the a.m. peak hour. These approach queues are expected to extend approximately 400 feet, but quickly dissipate. Thus, the overall change in operations as a result of the proposed development from an intersection capacity perspective is relatively minimal and within acceptable industry standards. No additional infrastructure is needed to support the proposed development from a roadway capacity perspective.

Table 4 Year 2030 Build Intersection Capacity

Intersection	Traffic Control	Level of Service (Delay)	
		AM Peak Hour	PM Peak Hour
Fallon Ave and School Blvd	AWSC	B (12 sec)	B (11 sec)
Fallon Ave and Starling Dr	SSS	A / A (5 sec)	A / A (5 sec)
Fallon Ave and Fallon Dr	SSS	A / A (4 sec)	A / A (4 sec)
Fallon Ave and 85th St	SSS	A / A (5 sec)	A / A (2 sec)
Mallard Ln and Tanager Cr / North Site Access	SSS	A / A (7 sec)	A / A (4 sec)
85th St and South Site Access	SSS	A / A (6 sec)	A / A (4 sec)
School Blvd and Pelican Ln	SSS	A / A (6 sec)	A / A (7 sec)
Fenning Ave (CR 18 / 118) and School Blvd	RAB	B (12 sec)	B (10 sec)
Fenning Ave (CR 118) and 85th St	SSS	A / A (3 sec)	A / A (3 sec)

AWSC – All Way Stop Control SSS – Side-Street-Stop RAB - Roundabout

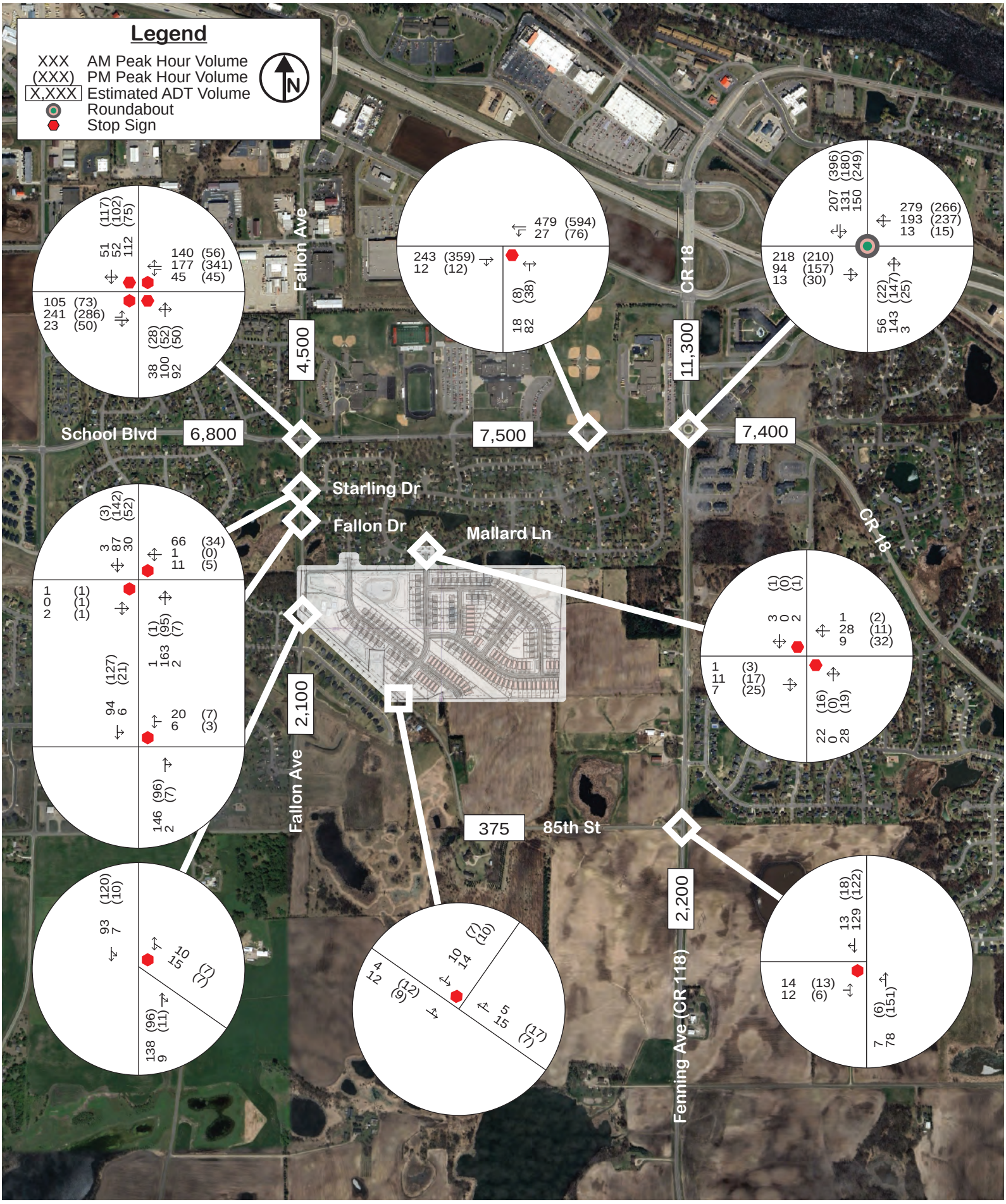
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Site Generated Trips

Meadows at Pioneer Park Development Traffic Study

Figure 4



Year 2030 Build Conditions

Meadows at Pioneer Park Development Traffic Study

Figure 5

SITE PLAN / OTHER CONSIDERATIONS

A review of the proposed site plan does not indicate any major issues. However, the following items are offered for further consideration between the City, County, and / or project team.

- Locate signage and landscaping to avoid creating any sight distance issues.
- Extend the sidewalk along the west side of Tanager Lane to Mallard Lane to improve connectivity.
- Add stop signs to the Tanager Lane and Tanager Circle approaches at Mallard Lane to help identify motorist right-of-way.
- Review truck maneuverability to limit potential internal circulation conflicts.
- Change the building / driveway orientations of the four lots closest to 85th Street to increase the distance of these driveways from 85th Street; year 2030 queues are anticipated to extend up to 50 feet (i.e., 2 vehicles), which is near the first two driveways shown.

In addition to the items noted, realignment of the 85th Street approach to Fallon Avenue should be discussed. Although there are no existing safety issues and the intersection volumes are anticipated to be relatively low, realignment of the skewed 85th Street approach to a more perpendicular configuration would help improve motorist visibility, as well as shorten the pedestrian crossing distance on the east approach.

CONCLUSIONS

Based on the findings of the study, the following conclusions are offered for consideration.

1) There does not appear to be any significant safety issues within the study area from a crash history perspective.
2) All study intersections and approaches currently operate at an acceptable overall LOS B or better during the typical weekday a.m. and p.m. peak hours and there are no significant existing intersection capacity issues within the study area.
3) The proposed development includes 157 single-family residential homes with construction anticipated to be fully completed by the year 2029.
4) Traffic forecasts were developed for year 2030 build conditions, which included a three (3) percent annual background growth and trip generation from the proposed development; the proposed development is estimated to generate 112 a.m. peak hour (28 in / 84 out), 152 p.m. peak hour (96 in / 56 out), and 1,528 daily trips.
5) Key takeaways from the future year 2030 build capacity analysis, include:
    a. All study intersections and approaches are expected to operate at an acceptable LOS C or better during typical weekday a.m. and p.m. peak hours.
    b. Most peak hour approach queues are anticipated to increase by one (1) or two (2) vehicles under future year 2030, except the westbound approach at the Fenning Avenue (CR 18 / 118) and School Boulevard intersection during the a.m. peak hour; these approach queues are expected to extend approximately 400 feet, but quickly dissipate.
    c. The overall change in operations as a result of the proposed development from an intersection capacity perspective is relatively minimal and no additional infrastructure is needed to support the proposed development.

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6) A review of the proposed site plan identified the following considerations:
   a. Locate signage and landscaping to avoid creating any sight distance issues.
   b. Extend the sidewalk along the west side of Tanager Lane to Mallard Lane to improve connectivity.
   c. Add stop signs to the Tanager Lane and Tanager Circle approaches at Mallard Lane to help identify motorist right-of-way.
   d. Review truck maneuverability to limit potential internal circulation conflicts.
   e. Change the building / driveway orientations of the four lots closest to 85th Street to increase the distance of these driveways from 85th Street; year 2030 queues are anticipated to extend up to 50 feet (i.e., 2 vehicles), which is near the first two driveways shown.
   f. Discuss realignment of the skewed 85th Street approach with Fallon Avenue to a more perpendicular configuration to improve motorist visibility and shorten the pedestrian crossing distance on the east approach.

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April 30, 2025

Matt Leonard
City Engineer/Public Works Director
City of Monticello
505 Walnut Street, Suite 1
Monticello, MN 55362

Re: Tamarack Residential Subdivision - PUD Plan Review
City Project No. 2024-38
WSB Project No. 026480-000

Dear Mr. Leonard:

We have reviewed the Tamarack residential subdivision PUD, preliminary plat, and site plans dated December 11, 2024. The applicant proposes to construct a 157-unit single-family residential development on a 67 acre parcel.

The documents were reviewed for general conformance with the City of Monticello's general engineering and stormwater treatment standards. We offer the following comments regarding these matters.

Preliminary Plat & General Comments

1. City staff will provide additional comments under separate cover.
2. Trail outlots or easements shall be 30' in width.
3. Verify the project concept will work with the existing utility easements on the property. Show the locations of existing easements on future submittals.
4. Provide confirmation from easement holders for grading, roadway improvements, and retaining walls within easements.
5. The plat will require 12' perimeter and 6' side-yard drainage and utility easements.
6. Expand lots to eliminate outlots D & F; they appear to have no public purpose.
7. The Fallon Avenue right of way shall be 50' from centerline.
8. Parking lots in the villa section of the project will require a license agreement and will be required to be maintained by HOA.
9. With future submittals provide soil borings and full geotechnical evaluation to verify soil conditions, groundwater elevations within the site, and the proposed pavement section meeting City design requirements.
10. Additional comments have been provided directly on the plan sheets. Not all comments on the plans have been summarized in this review letter.

701 XENIA AVENUE S | SUITE 300 | MINNEAPOLIS, MN | 55416 | 763.541.4800 | WSBENG.COM

Existing Site & Demolition Plan (Sheets C1.0)

11. Show all proposed removals/demolition on these sheets:
    a. Existing driveways are shown to be replaced on the proposed plans, show the necessary removal hatching/areas.
    b. Where Tanger Lanes meets the existing Mallard Lane, there appears to be concrete curb that also needs to be saw-cut and removed. Provide more detail for the proposed connections to existing streets.

12. The existing property boundaries and easements lines are hard to see on this plan. Make the linework darker so that it is clear.

Site & Street Plans (Sheets C2.0-C2.5; C8.0-C8.5)

13. City design standards require horizontal and vertical curve lengths to meet a 30 MPH design speed for local streets, at minimum. Generally, the minimum horizontal curve radius is 300' and the minimum vertical curve length is 90'. For low volume residential/neighborhood streets (not a thru street), the City can consider locations that do not meet this standard on a case-by-case basis. It appears the sharp horizontal curve to the east will not meet this criteria and will require additional review/consideration by City staff. Provide sight distance review of this curve as well.

14. Streets shall be designed in accordance with the applicable City Subdivision Ordinances and the City's General Specifications and Standard Details Plates for Street and Utility Construction. Here are initial comments:
    a. Provide a temporary cul-de-sac at Robin Street.
    b. Provide signage for "Future Thru Street" on barricades at all stub streets.
    c. Shift lights on Fallon Drive so that there is one on the curve.

15. The plan includes trails, sidewalks, and pedestrian facilities. See additional comments on pedestrian access and mobility requirements provided by City Staff under separate cover. A more detailed review will be provided with future submittals, here are initial comments:
    a. Review all locations where trails and/or sidewalks connect to roadways, all of these locations will require pedestrian curb ramps.
    b. Provide bump-outs at midblock trail crossing locations and narrow road to 26' wide at these locations.
    c. Center trail within easement/outlot where feasible.
    d. Paved pathways shall be 10' wide.

Utility Plans (Sheets C4.0-C6.10)

General:

16. With final construction plans, provide confirmation of MDH (watermain) and MPCA (sanitary sewer) plan review and permitting. The City engineer will need to review and sign the sanitary sewer permit.

17. Any public sanitary sewer and watermain shall be encompassed by drainage and utility easements where located outside of public road right of way. Drainage and utility easements will need to allow for a 1:1 trench from the invert of the utility with a minimum of 20' centered on the utility.

18. If split lots with existing structures are annexed into the City, provide utility stubs to serve the split lots. Once the utility stubs are provided, connection shall be made with the

timelines outlined in the City of Monticello Code Chapter 50: Water and Sewer Ordinance.

19. Provide utility stubs to the existing home on the lot that is being annexed.

20. Add general notes to the utility plans to the effect of:
    a. The City shall not be responsible for any additional costs incurred that are associated with variations in the utility as-built elevations. All utility connections shall be verified in the field.
    b. The City, or agents of the City, are not responsible for errors and omissions on the submitted plans. The Owner and Engineer of Record are fully responsible for changes or modifications required during construction to meet the City's standards.
    c. All watermain and sanitary sewer testing shall be conducted in accordance with the City standards and specifications. Copies of all test results shall be submitted to the City (Public Works Director, City Engineer), the Owner, and the Engineer of Record.
    d. Watermain shall have a minimum cover of 7.5'.
    e. Tracer wire installation shall be in accordance with the latest edition of the MN Rural Water Association Standards. See these standards for further details.
    f. The City will require televising for sanitary and storm sewer pipe installations prior to accepting a warranty for the utility system; provide report and video files to the City for review.

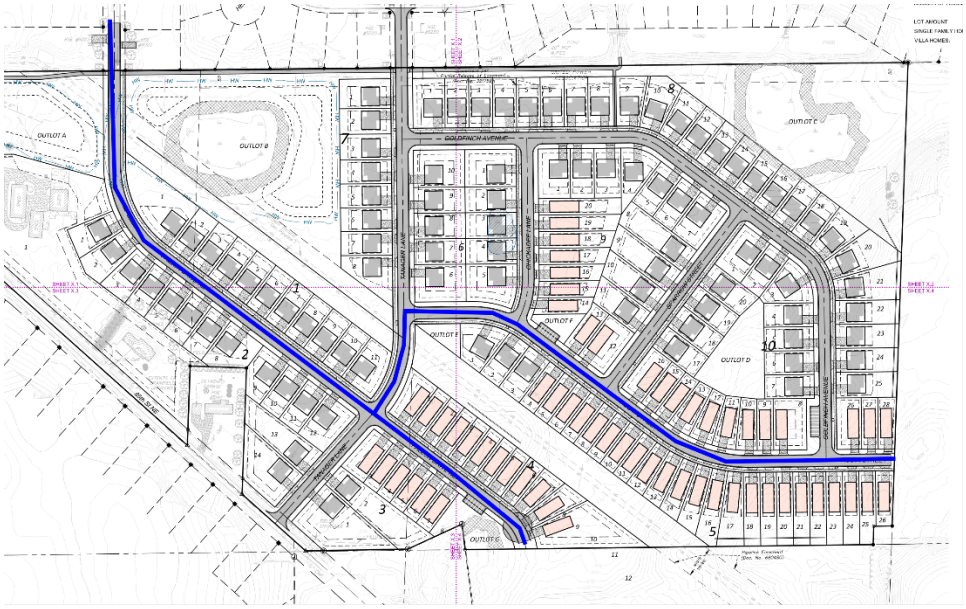
21. With final plat submittal provide the following:
    a. Plan/profile sheets for watermain, sanitary sewer, and storm sewer.
    a. Provide dimension notes from watermain to parallel sewer mains (storm and sanitary sewer); the minimum horizontal separation between mains is 10 feet. Where watermain crosses storm or sanitary sewer, add a note at each location to the effect of "Maintain 18" Minimum Separation, 4" Rigid Insulation" on both the plan view and profile view locations (both utility and storm sewer sheets).
    b. Show water/sewer service location to each lot and include the curb stop location at utility easement location (10' beyond ROW). For each lot location add the low floor opening elevation, sewer service station from downstream manhole, sewer service invert elevation at utility easement (10' beyond ROW), riser height if applicable, and curb stop elevation.

Watermain:

22. Hydrant locations shall be reviewed and approved of by the City Fire Marshal; typically, a maximum of 250' overlapping influence radius (maximum 400' spacing) is required along roadway (hose length). Provide an exhibit showing hydrant influence spacing. Currently, it looks like additional hydrant will need to be added.
    a. Hydrants should be located at intersections and property lines/corners.
    b. Hydrants should be placed at all water system vertical high points. Adjust watermain depth and hydrant locations as necessary.

23. The Fire Marshall and/or building department will review required fire hydrant location(s) and emergency vehicle access/circulation. Fire truck circulation will need to accommodate the City's ladder truck. Provide a turning movement exhibit to show that a fire truck can access all building structures and cul-de-sacs (provided). Additional comments may be provided under separate cover.

24. To the greatest extent possible, move curb stops to the adjacent green space if possible. If this option is not feasible, the curb stops will require curb stop casting covers. A final review will be performed with the final plan submittal.
25. The existing hydrant at the end of Fallon Drive being removed will need to be reinstalled.
26. Here are the locations where the City will require 10” watermain oversizing:

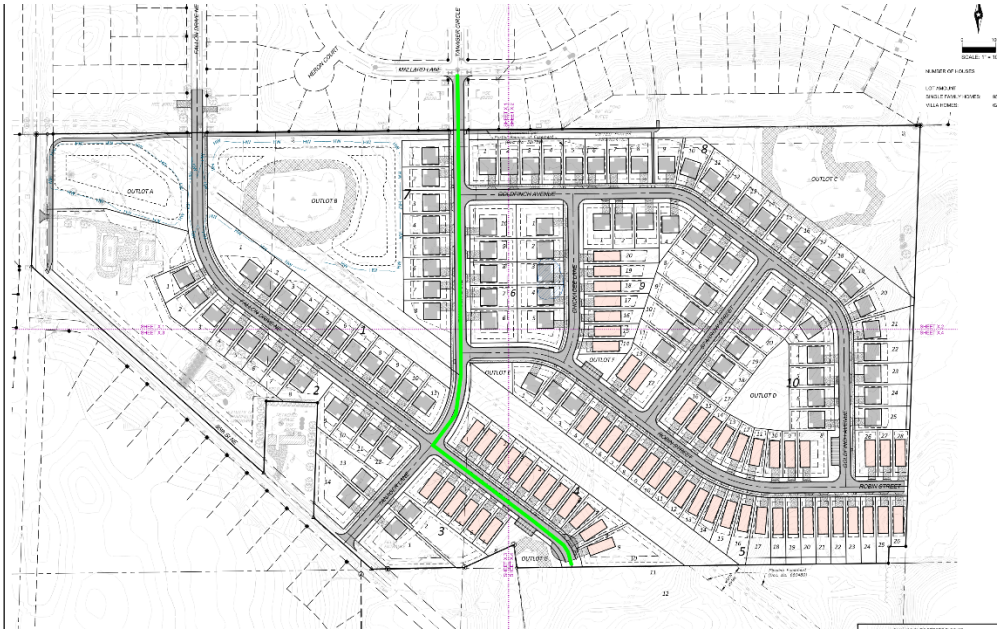


Sanitary Sewer:

27. All manholes shall be located along the centerline of the street. Complete.

Storm Sewer:

28. Within filtration areas, extend cleanouts to the base of the slope, note rim/invert elevations.
29. Add rip-rap quantities and class notes at each flared end section and pond overflows (if applicable).
30. On the final plans, note the sizes of the proposed storm sewer structures.
31. Storm catch basins shall have a minimum depth of 4.0’ to prevent freezing.
32. Here are the locations where the City will require the sanitary sewer to be as deep as possible:



Grading & Drainage Plans (Sheets C3.0-C3.4)

33. Retaining walls greater than 4’ in height will require certified engineering drawings/plans form a registered structural engineer. A safety fence/railing will be required at the top of walls 4’ or greater. Provide soil borings/geotechnical analysis for the area where the wall is proposed.

34. Reconfigure Outlot C or retaining wall onto Lot 20 so that no part of the wall is located within Outlot C.

35. Review grading on the east side of the project to determine if Robin Street should be raised; the road appears to be roughly 6’ lower than the adjacent property. Verify the road elevations will work when connecting into the adjacent property.

36. Storm sewer pipes should be in drainage and utility easements, please verify that pipes are all within easements.

37. Within filtration areas, extend cleanouts to the base of the slope, note rim/invert elevations.

38. Label more of the proposed contours and the location of all EOF’s. Locations of EOF’s or other concentrated discharge point over vegetated areas will require a permanent energy dissipation/stabilization method such as rip-rap or permanent turf reinforcement matting.

39. With final plat submittal provide the following
    a. In general maintain all surface grades within the minimum of 2% and maximum 33% slopes. Vegetated swale grades shall also be a minimum of 2.0%.
    b. Drainage arrows on plans showing direction of runoff. Note specifically high points between each side-yard swale.
    c. Include percent slope In all other swale locations and verify that it meets the City requirement of 2% minimum.
    d. Provide proposed driveway grades at each location.

e. Add rip-rap quantities and class notes at each flared end section and pond overflows (if applicable).
f. Note the size of proposed storm sewer structures.

Erosion Control & SWPPP Plans (Sheets C7.0, C9.0)

40. The proposed project will disturb more than one acre. Develop and include a SWPPP consistent with the MPCA CSWGP with future plan submittals.

41. An NPDES/SDS Construction Storm Water General Permit (CSWGP) shall be provided with the grading permit or with the building permit application for review, prior to construction commencing.

42. A detailed review of erosion/sediment control and SWPPP will be conducted with the final plat submittal.

Construction Notes & Standard Details Plans (Sheets C9.1-9.10)

43. Utilize City standard details where applicable.

44. The proposed street section should be reviewed and designed by a geotechnical engineer. Provide soil borings and geotechnical report with final plat submittal.

45. Provide specific typical sections for streets. The street sections should follow the updated City standard detail with 1 ½" wear course and 3" non-wear pavement.

46. Provide details for the proposed stormwater treatment areas.

47. Provide specific details for each of the control structures proposed.

48. A full review of standard details will be conducted with the final plat submittal.

Stormwater Management

49. Below are General Stormwater Requirements for the Site:
    a. The applicant will be required to submit a stormwater management plan for the proposed development in accordance with the requirements in the City's Design Manual.
    b. Infiltration is required for new developments. If infiltration is not feasible provide documentation on the rational before moving to additional BMP's. Because infiltration is not feasible for the site, stormwater sizing will defer to the Construction Stormwater General Permit volume control requirement of 1800 cu ft of treatment per acre of tributary area. Therefore, Pond 2 should provide 25,619 cu ft of storage below the outlet (1800 cu ft * 14.233 ac) and Pond 1 should provide 97,401 cu ft of storage below the outlet (1800 cu ft * (50.7+3.4)). Both ponds have sufficient storage, but please update calculations to reflect the 1800 cu ft of storage required per tributary acre.
    c. The new site will need to provide onsite volume control for runoff of 1.1" over the new impervious area, Pre-treatment measures are required prior to discharging to the volume control BMPs. Infiltration is not feasible, see above comment.
    d. Water quality requirements will be considered met if volume control is achieved for the site. If volume control cannot be met then the development will need to show a no net increase of TSS and TP.

e. Rate control will be required for the new development. All rates must be equal or less than existing rates for each discharge location. Given downstream restrictions, the City SWMP restricts the discharge rate from this site to 0.5 cfs for the 100-yr, 24-hour event. This will require additional flood storage volume onsite to accomplish the rate restriction, the proposed model reflects approximately 45 cfs.
f. An operation and maintenance plan for all stormwater BMPs is required and should be submitted with the stormwater report for review. Show maintenance access routes on plans. Access routes will need to be contained within a drainage and utility easement.
g. The site is not within the DWSMA and is subject to requirements of the City's Wellhead Protection Plan.

50. Provide calculations that show the reconstructed road to the north of the intersection between ponds 1 and 2 reduces impervious by replacing the cul-de-sac. Or show that this portion of impervious is routed to a BMP.

51. Provide stabilization at the overflows between Pond 1 and Wetland 3P.

52. The 100-year HWL should be contained with a drainage and utility easement and within the pond/wetland footprint. Currently Pond 1 HWL overtops the proposed EOF.

53. Two feet of freeboard is required for the HWL of a basin to the low opening of a structure. Two feet of vertical separation is also required from an area's EOF elevation to the low opening. Label EOF locations and elevations for each pond, wetland, and low point along roads/greenspace.

54. Include storm sewer sizing calculations with future plans. Refer to the City design guidelines for Storm sewer requirements.
    h. All flared end sections 12 inches in diameter and greater shall include trash guards per City detail
    i. The minimum full flow velocity within the storm sewer should be three fps. The maximum velocity shall be 10 fps, except when entering a pond, where the maximum velocity shall be limited to six fps.
    j. Vaned grate (3067V) catch basin castings shall be used on all streets.
    k. The maximum design flow at a catch basin for the 10-year storm event shall be three cubic feet per second (cfs), unless high capacity grates are provided. Catch basins at low points will be evaluated for higher flow with the approval of the City Engineer.

55. The last structure prior to discharge to a stormwater BMP is required to be a 4' minimum sump structure. Provide sump elevations on plans.

56. Confirm the OCS modeled in HydroCAD is consistent with detail. It appears the detail shows a 60" grate while HydroCAD is modeling 48". Please add inlet and outlet pipe size to OCS details.

57. It is recommended that the Haala grate on the proposed OCS be placed at a slope for maintenance. E.g. the front of the grate/pond side, would be approximately 1' lower than the back of the grate.

58. The proposed project will disturb more than one acre. Develop and include a SWPPP consistent with the MPCA CSWGP with future plan submittals. Provide calculations showing disturbed area, proposed impervious, and future impervious for the site.

59. An NPDES/SDS Construction Storm Water General Permit (CSWGP) shall be provided with the grading permit or with the building permit application for review, prior to construction commencing.

60. A detailed review of erosion and sediment control BMP's will take place with future submittals. Provide redundant perimeter control around all wetlands onsite.

Traffic & Access

61. The applicant is proposing three driveway access points, one extending from the existing Fallon Drive, one creating a south leg at the Mallard Lane and Tanager Circle intersection, and one located along 85th Street, approximately 1,200 feet east of Fallon Avenue. Street access spacing, grades, and sight lines will be reviewed with future submittals. Complete.

62. The site would generate approximately 1,481 daily trips, 111 AM peak hour trips and 148 PM peak hour trips. With this development and the Haven Ridge development connecting to the south, the proposed traffic is expected to have an impact along Fallon Avenue, 85th Street, Starling Drive, and School Boulevard. Complete.

63. Provide a traffic study for this development including impacted intersections, turn lane recommendations, and traffic control mitigation measures if needed. In addition, the location of the driveways adjacent to 85th St NE should be reviewed to make sure they are not impacted by the traffic turning on to 85th St NE. Comments have been provided on the draft traffic study.

64. A sight line analysis should be completed at the Site Access Street and 85th St NE. Sight line exhibit has been provided. Include proposed landscaping on the exhibit to verify sight triangle remain clear. Also verify the vertical curve to the southeast on 85th Street doesn't block sight lines.

65. Note centerline pavement marking removal on 85th Street at new Tanger Lane intersection.

66. Show pedestrian ramp locations at intersections.

Wetlands & Environmental

67. Provide a wetland delineation for approval by the Local Government Unit. Wetland boundaries should be included on future plans. The City requires buffers around existing wetlands and the buffer widths are based on the wetland function.

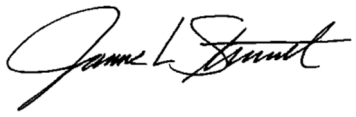
68. Any permanent or temporary wetland impacts from new development must be permitted under the Wetland Conservation Act through a replacement plan.

A more detailed review of the development plans will be completed when the applicant submits complete civil plans and a stormwater management report.

Please have the applicant provide a written response addressing the comments above. Feel free to contact me at 612-419-1549 if you have any questions or comments regarding the engineering review.

Sincerely,

WSB



James L. Stremel, P.E.
Senior Project Manager