Technical Memorandum

To: Nick Tomczik, Administrator
Rice Creek Watershed District
Cc: Tom Schmidt
John Kolb
From: Chris Otterness, PE
Subject: ACD 53-62 Branches 5+6 Repair Report
Date: March 5, 2025
Project #: R005555-0347

I hereby certify that the attached plan, specification, or report was prepared by me or under my direct supervision and that I am a duly registered Professional Engineer under the laws of the State of Minnesota.

Chris Otterness March 5, 2025
Reg. No. 41961

DRAFT

INTRODUCTION AND EXECUTIVE SUMMARY

The purpose of this memorandum is to provide the Rice Creek Watershed District (District) with an analysis and description of proposed repair alternatives to portions of Anoka County Ditch (ACD) 53-62 Branches 5 and 6, including a preliminary opinion of probable cost for the recommended repairs.

The primary issue identified for ACD 53-62 Br 5+6 is sediment and vegetation build-up in the channel causing a reduction in conveyance capacity along several of the laterals and branches. A few culverts are situated at a higher invert elevation than the As Constructed and Subsequently Improved Condition (ACSIC), which can be a contributing factor to the sediment accumulation. Several laterals or Branches traverse through MnDNR regulated public water wetlands and require additional coordination for repair alternatives. Recommended repairs are primarily comprised of sediment cleanout in the ditches, and adjacent vegetation management.

BACKGROUND

LOCATION OF THE PUBLIC DRAINAGE SYSTEM

The ACD 53-62 Br 5+6 public drainage system is located within Sections 15, 22, 23, 26 & 27 T31N, R23W, within the City of Blaine, Anoka County as displayed with **Figure 1**. ACD 53-62 Branch 5 consists of a primary branch and two laterals. Branch 5 Lateral One is currently not connected to Branch 5 due to a lack of a culvert under 109th Avenue and drains north and east towards a private lateral ditch. Branch 5 Lateral 2 drains north towards Branch 5, which then drains to ACD 53-62 Main Trunk. Branch 6 consists of a primary branch and one lateral, which drain north to ACD 53-62 Main Trunk. The drainage area of Branches 5 and 6 that contributes runoff to the public drainage system is approximately 1,050 acres and is primarily composed of urban land uses including residential (single

family), commercial and industrial. A large portion of the contributing drainage area is forested and has many marsh areas. Branches 5 and 6 drain north and east towards the ACD 53-62 Main Trunk. The outlet of ACD 53-62 is Golden Lake, which drains to Rice Creek.

CURRENT CONDITION OF THE SYSTEM

Houston Engineering, Inc. (HEI) completed a ground survey of ACD 53-62 Branch 5+6 in 2011 as part of the determination of the as constructed and subsequently improved condition (ACSIC) and to reestablish the public drainage system record. Another ground survey in 2023 along Branches 5 and 6 confirmed channel cross section configuration and verified sediment accumulation in portions of the channel. The existing ditch bottom profile is depicted in the Plan and Profile drawings (**Appendix A**) and is based on the 2023 survey. Drone survey completed in 2024 provided ditch inspection and visually confirmed locations of obstructions in the ditches. Branch 5 downstream from Lateral 2, Branch 6 downstream from Lateral 1, and Branch 6 Lateral 1 have been recently cleaned by the District through their normal maintenance program, do not exhibit significant sediment deposition or vegetative blockages, and therefore do not require repairs at this time.

WETLANDS ALONG THE PUBLIC DRAINAGE SYSTEM

The Wetland Conservation Act (WCA) uses the three criteria identified in the United States Army Corps of Engineers (USACE) Wetlands Delineation Manual issued in 1987, and the Regional Supplement to the USACE Delineation Manual, (North central and Northeast Region), to determine wetland locations. The three criteria are: 1) the presence of hydrophytic vegetation; 2) the presence of hydric soils; and 3) hydrology. Of those criteria, hydrology is the primary factor that has potential to be affected by ditch repair and/or improvements. A field wetland delineation was completed in the fall of 2024 to identify and characterize wetlands adjacent to ACD 53-62 Branches 5 and 6 that could potentially be impacted by repairs. The LGU approved the wetland boundary decision on December 16th, 2024.

PUBLIC WATERS ALONG THE PUBLIC DRAINAGE SYSTEM

Wetlands that meet the definition of “public waters” under MN Statute 103G are administered by the DNR under MS 103G rather then under WCA. DNR has identified three public water wetlands along the ACD 53-62 Branch 5 and 6 drainage system. Public water wetland (PWW) #02-582 is along Branch 5 Lateral 1. PWW #02-589 and PWW #02-706 are both located along Branch 5 Lateral 2.

THREATENED AND ENDANGERED SPECIES

The Minnesota Natural Heritage Information System identifies four species classified as “threatened” that are in the vicinity of the project: *Emydoidea blandingii (Blanding’s Turtles), Phalaropus tricolor (Wilson’s phalarope), and Myotis septentrionalis (longeared bat) and Bombus affinis (rusty patched bumble bee)*. In correspondence regarding the project, the DNR has indicated “To demonstrate avoidance, a qualified surveyor will need to determine if suitable habitat exists with the activity impact area and, if so, conduct a survey prior to any project activities.”

Therefore, a rare plant field survey was conducted by Critical Connections Ecological Services at critical times throughout the months of June through October. Rare plant species were identified along the ditch construction corridor from the field survey and are shown in **Appendix D**. One state listed endangered species was detected: *Rubus stipulates* (Bristle-berry); two state-listed threatened species were detected : *Planthathera flava* var. *herbiola* (Tubercled Rein-orchid) and *Rubus semisetosus* (Swamp Blackberry), and one special concern species was detected: *Rubus multifer* (Kinnickinnic Dewberry), The detections were isolated to two locations: Branch 5 Lateral 2 STA 64+70 to 65+30 and Branch 6 STA 41+00 to 43+00.

REPAIR ALTERNATIVES

The purpose of the proposed repair is to restore the drainage system function to a level of service consistent as nearly as practicable as possible to the as-constructed and subsequently improved condition (ACSIC) of Branches 5 and 6 and to provide a functional value to the landowner's drainage to this portion of the ACD 53-62 system. The functional value of the system has changed from the time at which it was constructed as land use has changed from agricultural to urban. In its historical agricultural setting, the drainage system's primary purpose was to provide an efficient outlet for low magnitude, high frequency rainfall events that could damage crops and to reduce hydrology in wetland fringes enough to enable haying and pasturing during drier periods. These functional values are no longer necessary under current land use. Rather the system's primary value is to provide an efficient and predictable outlet for high magnitude, low frequency rainfall events to protect public (roadway) and private (building) infrastructure. Along with the 2-year rainfall event, key evaluators for performance of the system include the 10-year and 100-year rainfall events.

Due to the presence of several Public Waters and wetlands subject to the Wetland Conservation Act (WCA) along the system, along with the presences of threatened and endangered species, there is the potential for wetland impact that is costly or infeasible to mitigate. For this reason, multiple alternatives have been conceptualized to evaluating varying levels of service against project cost and environmental impact. The following is a description of these alternatives.

Alternative 1: Existing Conditions (Do Nothing)

This alternative represents current degraded conditions in the public drainage system as surveyed in September 2023 and is intended to provide a point of reference for the restoration of function that can be provided by other alternatives compared to current conditions. As the system will continue to degrade if left unmaintained, this condition is temporary and does not provide predictable function. For these reasons, this alternative is infeasible and does not warrant further evaluation.

Alternative 2: ACSIC Repair

The rationale for this alternative is to provide the maximum capacity and depth of drainage that would be considered to be "repair" under M.S. 103E. This alternative includes excavation of the entire length of open channel along Branches 5 and 6 and their laterals to the ACSIC grade and cross-section, where the current ditch grade is above the ACSIC grade or where vegetation in the channel bottom is restricting flow. This also includes lowering of culverts at public and private crossings of the ditch to the ACSIC grade, where the culverts are currently greater than one foot above the ACSIC grade, and adds a culvert under 109th Avenue to reconnect Branch 5 Lateral 1 (north of 109th Ave.) to Branch 5 (south of 109th Ave). **Figure 3** shows a graphic depiction of Alternative 2. This alternative lowers water levels in and along public waters and wetlands and therefore is subject to regulation under M.S. 103G and under the WCA. This alternative is likely to impact wetlands and rare plant species resulting in substantial mitigation cost and permitting conditions. These costs must be weighed against the added system capacity provided by this alternative.

Alternative 3: Selective Repair

The rationale for this alternative is to restore predictable drainage function to Branches 5 and 6 for high magnitude, low frequency rainfall events (10- and 100-year rainfalls) while avoiding the potential for non-exempt impacts to public waters, wetlands regulated under WCA, or threatened and endangered species. Avoiding the potential for environmental impacts is consistent with the goals and policies of the District's Watershed Management Plan and is fiscally responsible to benefitting landowners, as the cost of mitigation is considerable for the footprint of the impact. To avoid these environmental impacts, repairs in certain critical areas are completed to a depth less than the ACSIC or avoided altogether for this alternative. Instead, repairs are targeted to allow the drainage system to provide functional and satisfactory drainage for residents. Repairs generally include the removal of accumulated sediment from the channel, vegetation management, culvert removals where crossings are no longer utilized, and minor channel bank stabilization. The project is not located in an agricultural area, but is primarily residential, commercial, and industrial. Primary concerns for drainage performance are to reduce flooding of property and ensure adequate roadway crossings where practicable; meaning culverts adequately sized and keep roads passable when possible.

In an early coordination meeting, the MnDNR provided input on repair actions it would consider to likely result in public waters impacts requiring mitigation. HEI also independently reviewed the hydrologic affect of repairs to the ACSIC grade and identified locations where repairs to the ACSIC grade through public waters would have minimal added value to upstream landowners. These locations include:

- PW #02-0582 (STA 11+75 to 14+75 Br. 5 Lateral 1): The lateral is not directly connected to the remainder of the public drainage system, and adjacent development has been constructed with the current function considered. The lateral serves no useful function and should be considered for abandonment. Alternative 3 includes no work on this lateral or on a connection via a culvert under 109th Ave.

- PW #02-589 (STA 51+10 to 86+55 Br 5 Lateral 2): Alternative 2 repairs to the ACSIC through this public water provide marginal benefit to upstream residential properties as the work would not significantly change the 2-year, 10-year and 100-year rainfall flood elevations on those properties and would require significant regulatory engagement with the DNR including potentially impact mitigation. Alternative 3 repair instead includes removal of sediment and vegetation mass that has built up within the channel through this public water and does not include the lowering of culvert at STA 50+75.
- PW #02-706 (STA 89+00 to 98+40 Branch 5 Lateral 2): Alternative 2 and 3 repairs both include the removal of sediment and vegetation mass that has built up within the channel through this public water. No modification to the runout of the public water is proposed.

Likewise, potential impacts to WCA wetlands were considered relevant to likely added value provided by repairs. For the avoidance of significant wetland impact mitigation, Alternative 3 is modified in one location from the ACSIC:

- STA 45+00 Branch 6: An existing Type 3wetland at the upstream end of Branch 6 would be significantly drained by Alternative 2. The upstream end of the ditch only services one property and cleaning the ditch all of the way into this Type 3 wetland would not significantly provide added value to that property. Stopping short of the Type 3 wetland near the property line (as envisioned by Alternative 3) would still provide a reliable, functional outlet to upstream properties while avoiding costly wetland mitigation.

Potential impacts to threatened and endangered species, and the cost of addressing the potential for impacts, is also addressed by Alternative 3. This includes the following modifications from an ACSIC repair

- STA 64+70 to 65+30 Branch 5 Lateral 2: For Alternative 2 and 3, avoidance of surveyed rare plant species should be implemented through construction fencing to avoid impacts.
- STA 41+00 to 43+00 Branch 6: Alternative 2 proposes repairs through this location. Due to the proximity of the rare plant species to the ditch, impact avoidance would be challenging and likely require restrictions on types and timing of equipment used. For Alternative 3, repairs will stop short of the noted locations of threatened plant species. Limiting this repair will not adversely affect drainage function as repairs would not fully extend to the end of the ditch due to potential WCA wetland impacts requiring mitigation (see above)

A graphic depiction of Alternative 3 is provided in **Figure 4** respectively.

EVALUATION OF REPAIR ALTERNATIVES

HYDRAULIC EFFICIENCY

Portions of the ACD 53-62 Branch 5 & 6 ditch system are vegetated or have significant sedimentation, have deadfall and other obstructions, and have culverts set above the ACSIC grade.

The proposed repair will remove the obstructions to restore the hydraulic efficiency of the system and provide a predictable and reliable outlet for residential and commercial uses. Continued degradation of the channel will continue to decrease capacity of the channel and will cause more flow to go into the overbank and result in unpredictable flows and flooding in adjacent homes and commercial areas. The repair will provide predictable system response during large rainfall events such as the 10-year and 100-year 24 hour events and will help to reduce peak flood levels and durations.

The InfoSWMM hydrology and hydraulics model was run as a continuous simulation with a "normal" precipitation pattern[1] for a growing season. The model was used to generate annual average water elevations throughout Branch 5, Branch 5 Lateral 1, Branch 5 Lateral 2, Branch 6 and Branch 6 Lateral 1 for both the current and proposed channel conditions. The model results displayed within **Table 1** indicate that both Alternatives 2 and 3 would result in a reduction in average water surface elevation (WSEL) in excess of a foot for most of Branch 5 and some portions of Branch 5 Lateral 2 and Branch 6. At the lower end of Branch 5, the tail water from the Main Trunk of ACD 53-62 controls the daily water elevation. Overall, the model results demonstrate that either repair alternative will result in a substantial increase in the drainage function of the ACD 53-62 Branch 5 and 6 system compared to the existing (degraded) condition. The majority of homes and businesses are located outside of the existing 100-year peak flood elevation in the areas of Branch 5, Branch 5 Lateral 1 & 2, Branch 6 and Branch 6 Lateral 1. The existing and repair average WSEL over an entire growing season is used to estimate the lateral effect of drainage.

There are currently 5 culvert crossings and a bridge crossing on the ACD 53-62 Branch 5 & 6 public drainage system. Two culvert crossings are along Branch 6 lateral 1. One culvert crossing is located on Branch 5 and serves as the outlet to the Main Trunk of ACD 53-62 system. The remaining two culvert crossings are located on Branch 5 Lateral 2 and serve as the outlet of PWW #02058900 and PWW #02070600. Culverts were sized using the following criteria:

1) ability to pass the 2-year discharge without exceeding the banks into agricultural land,
2) ability to pass the 2-year discharge without overtopping private and field crossings
3) ability to pass the 10-year discharge without overtopping local (municipal) roadways
4) ability to pass the 50-year discharge without overtopping County Roads, and
5) the ability to pass a 100-year event without impacting structures (buildings).

All five culverts on Branches 5 and 6 and their laterals were confirmed to be sized adequately and no upsizing of culverts is recommended.

For Alternative 3, Branch 5 Lateral 2 culverts will remain at their current inverts to hold the public water wetland runout elevations and no lowering of the 3 other culverts will take place. Full repair to

[1] This simulation uses rainfall data from 1979, which had a precipitation total nearly identical to the average annual precipitation.

the ACSIC profile (Alternative 2) would include lowering of the culverts on Branch 5 Lateral 2 at STA 50+75 and Branch 6 Lateral 1 STA 24+25 and installing a 12" culvert crossing under 109th on Branch 5 Lateral 1 at STA 0+66 to provide additional capacity over the selective repair, however substantial impact to public waters may occur.

Both repair alternatives decrease the flooding risk in adjacent homes and properties. The ACSIC repair (Alternative 2), and selective repair (Alternative 3), provide similar reductions in peak elevations for Branch 5, Branch 5 Lateral 2 and Branch 6 during the 2-, 10-, and 100-year events. Where Branch 5 outlets into the Main Trunk, little to no reduction in peak flows occur due to controlling downstream elevations and flows. Alternative 2, repair to the ACSIC, significantly reduces the average water surface elevation for the growing season but provides minimal functional purpose to the landowners over the selective repair.

Table 1: Comparison of Existing and Repair Conditions Water Surface Elevations (feet)[2]													
		Average Growing Season Water Surface Elevation			2-year Rainfall Event Waters Surface Elevation			10-year Rainfall Event Waters Surface Elevation			100-year Rainfall Event Waters Surface Elevation		
	STA	Existing	Alt. 2 Change	Alt. 3 Change	Existing	Alt. 2 Change	Alt. 3 Change	Existing	Alt. 2 Change	Alt. 3 Change	Existing	Alt. 2 Change	Alt. 3 Change
Branch 5	0+00	892.20	0.00	0.00	894.92	0.10	-0.02	895.90	0.04	-0.01	897.16	0.13	0.08
	1+04	892.20	0.00	0.00	894.96	0.11	-0.03	895.96	0.04	-0.04	897.36	0.37	0.12
	6+00	892.20	0.00	0.00	894.96	0.11	-0.03	895.96	0.04	-0.04	897.36	0.38	0.13
	11+00	892.20	0.00	0.00	894.97	0.11	-0.04	895.97	0.04	-0.04	897.36	0.38	0.13
	16+00	892.20	0.00	0.00	894.98	0.12	-0.04	895.97	0.04	-0.04	897.37	0.38	0.13
	23+00	893.54	-0.05	-0.03	895.00	0.12	-0.05	895.98	0.04	-0.05	897.37	0.38	0.13
	26+00	894.10	-0.04	-0.03	895.21	0.14	-0.12	896.07	0.08	-0.06	897.58	0.25	-0.01
	31+00	896.60	-1.27	-1.27	896.60	-0.95	-0.60	896.86	-0.71	-0.46	897.65	0.18	-0.06
	36+00	896.80	-1.46	-1.46	897.39	-1.42	-1.27	897.62	-1.12	-1.03	897.83	0.08	-0.20
	41+00	897.19	-1.84	-1.84	897.98	-1.92	-1.82	898.39	-1.81	-1.75	898.18	-0.26	-0.53
	48+00	897.92	-2.57	-2.57	898.04	-1.88	-1.83	898.40	-1.67	-1.66	899.85	-1.86	-2.09
Branch 5 Lateral 1	1+00	896.77	-1.57	0.00	897.28	-1.10	0.00	897.53	-0.62	0.00	897.95	0.33	0.00
	4+50	896.77	-1.55	0.00	897.28	-1.10	0.00	897.52	-0.61	0.00	897.93	0.35	0.00
	10+50	896.79	-1.52	0.00	897.26	-1.06	0.00	897.49	-0.56	0.00	897.85	0.43	0.00
	15+00	895.07	-0.05	0.00	896.00	0.16	0.00	897.23	-0.30	0.00	897.66	0.62	0.00
	20+00	895.07	0.33	0.00	895.81	0.39	0.00	897.23	-0.31	0.00	897.66	0.62	0.00
	22+50	896.18	0.00	0.00	897.08	-0.46	0.00	897.24	-0.29	0.00	897.84	0.44	0.00
Branch 5 Lateral 2	0+00	894.10	0.00	0.00	895.21	0.14	-0.12	896.07	0.08	-0.06	897.58	0.25	-0.01
	12+60	896.35	-0.77	-0.76	896.12	0.37	-0.19	896.29	0.55	0.06	897.76	-0.57	-0.50
	26+60	897.19	-0.73	-0.7	897.53	0.29	-1.12	898.14	-0.10	-1.04	898.58	-0.29	-1.04
	31+00	898.43	-1.56	-1.54	898.21	-0.33	-1.68	898.43	-0.34	-0.93	899.77	-1.43	-1.25
	36+00	900.09	-2.86	-2.84	899.32	-0.74	-1.90	899.87	-0.74	-1.94	900.82	-1.74	-1.34
	42+00	900.10	-2.17	-2.15	899.98	-0.67	-0.85	900.01	-0.52	-0.41	900.91	-1.28	-0.89
	51+90	900.23	-2.11	-2.09	901.05	-1.01	-1.76	901.24	-1.00	-1.53	901.01	-0.89	-0.92
	55+60	901.44	-2.86	-1.32	902.60	-0.38	-0.32	902.56	-0.21	0.26	902.57	0.15	0.16

[2] All elevations provided herein are based on North American Vertical Datum of 1988 (NAVD 88)

HOUSTON engineering, inc.

Table 1: Comparison of Existing and Repair Conditions Water Surface Elevations (feet)[2]													
		Average Growing Season Water Surface Elevation			2-year Rainfall Event Waters Surface Elevation			10-year Rainfall Event Waters Surface Elevation			100-year Rainfall Event Waters Surface Elevation		
	STA	Existing	Alt. 2 Change	Alt. 3 Change	Existing	Alt. 2 Change	Alt. 3 Change	Existing	Alt. 2 Change	Alt. 3 Change	Existing	Alt. 2 Change	Alt. 3 Change
	61+40	901.53	-2.56	-1.37	902.83	-0.53	-0.51	902.81	-0.38	-0.01	903.30	-0.53	-0.28
	66+60	901.76	-2.44	-1.51	902.84	-0.51	-0.51	902.82	-0.35	-0.02	903.30	-0.51	-0.28
	70+10	901.77	-2.22	-1.28	902.84	-0.50	-0.52	902.83	-0.36	-0.03	903.31	-0.51	-0.29
	75+10	901.94	-2.06	-1.45	902.85	-0.50	-0.52	902.85	-0.36	-0.04	903.31	-0.51	-0.29
	78+50	901.94	-1.81	-1.44	902.84	-0.50	-0.53	902.84	-0.36	-0.01	903.31	-0.52	-0.32
	87+70	902.27	-1.23	-1.23	902.38	-0.20	-0.51	902.47	-0.08	-0.24	902.90	-0.31	-0.52
	95+30	902.27	-1.15	-1.14	902.43	-0.10	-0.16	902.47	-0.05	-0.05	903.01	-0.43	-0.54
	103+20	902.84	-1.26	-1.25	903.53	-0.87	-0.86	903.53	-0.84	-0.72	903.36	-0.61	-0.59
Branch 6	0+00	892.18	0.00	0.00	894.75	0.10	-0.01	895.76	0.03	-0.01	897.23	-0.06	-0.10
	5+30	892.18	0.00	-0.01	894.76	0.11	-0.01	895.77	0.03	-0.01	897.24	-0.06	-0.10
	11+00	892.19	0.00	-0.01	894.80	0.11	-0.01	895.80	0.03	-0.01	897.25	-0.05	-0.09
	18+50	892.19	0.00	-0.01	894.82	0.11	-0.01	895.83	0.03	-0.01	897.25	-0.03	-0.07
	23+00	892.19	0.00	-0.01	894.83	0.12	-0.01	895.85	0.03	-0.01	897.25	0.00	-0.04
	28+00	897.70	-0.69	-0.68	897.94	-0.47	-0.63	898.09	-0.46	-0.50	897.25	0.00	0.00
	34+00	900.15	-2.04	-2.03	900.62	-0.98	-1.52	900.82	-0.65	-0.78	901.22	-0.35	-0.32
	38+00	900.31	-1.10	-1.1	900.95	-0.54	-1.21	902.46	-0.77	-1.27	901.69	-0.54	-0.50
	42+50	901.29	-0.97	-0.96	901.77	-0.21	-0.72	902.48	-0.36	-0.37	902.93	-0.60	0.00
	45+50	902.68	-1.97	0.00	903.40	-1.35	-0.04	903.55	-0.91	0.00	904.02	-0.02	0.00
Branch 6 Lateral 1	0+00	892.19	0.00	0.00	894.83	0.00	0.00	895.85	0.03	0.00	897.25	0.00	0.00
	2+20	894.78	0.00	0.00	894.83	0.00	0.00	895.85	0.03	0.00	897.93	-0.68	0.00
	5+00	896.05	0.01	0.00	895.21	0.00	0.00	895.85	0.03	0.00	898.41	-1.15	0.00
	11+00	897.95	0.01	0.00	897.82	0.00	0.00	898.44	0.00	0.00	900.25	0.69	0.00
	17+00	900.18	0.01	0.00	898.86	-0.01	0.00	899.24	-0.01	0.00	900.81	0.20	0.00
	19+30	901.88	-0.80	0.00	901.02	-0.03	0.00	901.29	-0.04	0.00	903.28	-1.75	0.00
	24+00	901.82	-0.75	0.00	901.96	-0.01	0.00	902.65	0.17	0.00	903.28	-0.75	0.00
	34+00	902.95	-1.84	0.00	902.11	-0.05	0.00	903.15	-0.21	0.00	903.38	-0.65	0.00

WETLAND IMPACTS

A desktop wetland delineation was completed in May 2024 for this repair report to recognize permitting requirements and identify possible issues.

A field delineation was then completed in the fall of 2024, with notice of decision from the LGU on 12/16/2024. Geomorphic setting, water source, and hydrodynamics were assessed to determine the hydrogeomorphic classification of the wetlands within the project area. All wetlands were determined to be depressions. Each wetland was also typed according to Circular 39. The majority of the field delineated wetlands have been identified as Type 1 Seasonally Flooded, Type 3 Shallow Marsh and Type 6 Scrub Shrub. Per the Technical Evaluation Panel's request, areas of permanently and semi-permanently flooded areas were determined. Under the updated WCA rules, impacts to the permanently and semi-permanently flooded areas resulting from drainage system repair will require mitigation if impacts occur from the repair.

Altered Wetland Hydrology and Impacts

Wetland Hydrology is a function of several factors, including the source of the hydrology, the conductivity of the soils (i.e. lateral drainage effects), and the outlet. The results of the lateral effects analysis, described herein and derived from the Van Schilfgaarde equation, were used to provide an initial estimate of the wetlands with altered hydrology due to lateral drainage effects. Since the existing conveyance system has already affected the existing wetlands, the repaired condition was compared with the existing condition to determine the additional effectively drained wetland areas.

The recommended repair falls under the definition of a "repair" under Minnesota Statute 103E. Repairs to public drainage systems, as defined by MS 103E.701, do not require a replacement plan for draining or filling of wetlands, except for draining wetlands that have been in existence for more than 25 years (Sec. 79. Minnesota Statutes 2022 section 103G.2241, Sub 2. Drainage. A). WCA regulates the draining or filling of wetlands, wholly or partially, and excavation in the permanently and semi permanently flooded areas of wetlands, and in all wetland areas if the excavation results in filling, draining or conversion of non-wetland (8420.0105 Subp 1).

Lateral Effects Analysis

The impact of surface drainage systems on wetlands was initially evaluated through a modification of the Van Schilfgaarde equation (consistent with previous District repair reports for ACD 53-62 Branch 1 and ACD 10-22-32). The basis for using this tool was Part 650, Engineering Field Handbook, Chapter 19, and Hydrology Tools for Wetland Determination. The modified Van Schilfgaarde equation was deemed an appropriate starting point for establishing a reasonable baseline for this analysis because the equation was developed for non-steady state conditions and is a natural fit for the unsteady (i.e., continuous simulation) modeling analysis of the summer growing season. The Van Schilfgaarde equation was programmed in a GIS tool to accept the parameter inputs for each

segment based on soils analysis and the continuous simulation InfoSWMM model. Known limitations of this method are that it was developed for determining adequate spacing of drain tile systems for pattern-tiling agricultural fields. Applying this method for open channel ditches is used primarily to establish a baseline condition for comparison purposes between existing and proposed conditions.

Repair alternatives restore conveyance and reduce the water levels in the ditch relative to current conditions. The effective lowering of the water levels is dependent on the location and physical properties of each location; alterations proposed for the ditch; and the hydrology moving through the site. To capture this variability across the ACD 53-62 watershed, the lateral effect analysis was performed by segments of the drainage system. The system was divided into segments consistent with the spatial scale used for the InfoSWMM hydraulics. The segments were intersected with the soil layer for Anoka County. Average daily water level depths over the growing season were generated using an iterative process to calculate the equivalent depth in the van Schilfgaarde equation based on the depth of the free water surface for the drainage segments within the InfoSWMM hydraulics model. The upstream and downstream water level depth values for the segment node endpoints were used to compute average water level depths for the segments, sub-divided based on the soil type and drainage system type. Inputs for the drainable porosity in the equation account for the water storage by surface roughness. GIS software was then utilized to map the lateral effect distance from the ditch segment centerline on both sides of the ditch segment. The calculated lateral effects from Van Schilfgaarde for each ditch segment are displayed in **Figure 5**.

Note that the Van Schilfgaarde equation predicts that the existing ditch drains portions of the adjacent wetlands, including areas that currently are permanently or semi-permanently inundated. This indicates that the ditch in these locations is not affecting the hydrology of adjacent wetlands, due to nature of the underlying soils and/or the amount of hydrology coming lateral into the wetland. In these cases, further deepening of the ditch via a repair does not have the potential to impact the wetland. These locations include STA 27+00 to 43+00 of Branch 5 and STA 27+00 to 35+00 of Branch 6.

In other locations (specifically, STA 5+00 to 13+00 of Branch 5 Lateral 2), Van Schilfgaarde predicts no lateral effects to semi-permanently or permanently flooded wetlands along the ditch under existing conditions but significant lateral drainage effect under proposed conditions. In these locations, the likely effect of repairs can be predicted by considering the effect of previously maintained ditches in nearby wetlands.

At the upper end of Branch 6 (STA 45+50), an open water wetland is maintaining its surface water level based on the runout elevation in the ditch bottom. Removing sediment immediately downstream of the wetland (as envisioned in Alternative 2 but avoided in Alternative 3) will lower surface water levels throughout the wetland, resulting in wetland impacts which would need to be mitigated.

Table 2: Consideration of Likely Impacts from Repairs		
Location	**Van Schilfgaarde Prediction**	**Analysis**
Branch 5 STA 0+00 to 27+00	Existing: 70' (+/-) scope/effect Repair: 70' (+/-) scope/effect	Semipermanent flooding exists currently within the predicted scope/effect of the ditch. The ditch currently does not affect adjacent hydrology, and repairs will not change that.
Branch 5 STA 27+00 to 36+00	Existing: No scope/effect Repair: 45' (+/-) scope/effect	Identical conditions to Branch 5 STA 0+00 to STA 27+00, where semipermanent flooding exists next to cleaned ditch. Therefore, repairs are unlikely to result in wetland loss.
Branch 5 STA 36+00 to 41+00	Existing: No scope/effect Repair: 115' (+/-) scope/effect	Identical conditions to Branch 5 STA 0+00 to STA 27+00, where semipermanent flooding exists next to cleaned ditch. Therefore, repairs are unlikely to result in wetland loss.
Branch 5 Lateral 2 STA 5+00 to 13+00	Existing: No scope/effect Repair: 95' (+/-) scope/effect	Identical conditions to Branch 5 STA 0+00 to STA 27+00, where semipermanent flooding exists next to cleaned ditch. Therefore, repairs are unlikely to result in wetland loss.
Branch 6 STA 0+00 to 23+00	Existing: 115' (+/-) scope/effect Repair: 115' (+/-) scope/effect	Semipermanent flooding exists currently within the predicted scope/effect of the ditch. The ditch currently does not affect adjacent hydrology, and repairs will not change that.
Branch 6 STA 23+00 to 27+00	Existing: 70' (+/-) scope/effect Repair: 70' (+/-) scope/effect	Semipermanent flooding exists currently within the predicted scope/effect of the ditch. The ditch currently does not affect adjacent hydrology, and repairs will not change that.
Branch 6 STA 27+00 to 35+00	Existing: No scope/effect Repair: 130' (+/-) scope/effect	Identical conditions to Branch 6 STA 23+00 to STA 27+00, where semipermanent flooding exists next to cleaned ditch. Therefore, repairs are unlikely to result in wetland loss.
Branch 6 STA 45+50	N/A	Repairs will lower runout of upstream wetland resulting in reduced surface hydrology. Likely impacts of 0.9450 acres.

The calculated additional wetland impacts are 0.9450 acres over the relevant permanent and semi permanently flooded wetlands for the Alternative 2 and 0.0000 acres of impact for Alternative 3. Under the Village Meadows Comprehensive Wetland Protection and Management Plan (CWPMP), mitigation for wetlands in this location is at a 2:1 ratio.

Table 3: WCA Wetland Mitigation Requirements		
ACD 53-62 Alternative	**Acres of Wetland Impact**	**Acres of Mitigation Required**
2 (ACSIC)	0.9450	1.8900
3 (Partial)	0.0000	0.0000

THREATENED AND ENDANGERED SPECIES

Public drainage systems may encounter situations where Minnesota's Endangered Species Statute (MS 84.0895) and the associated Rules apply. The endangered species program regulates activities that take, import, transport, or sell any portion of an endangered or threatened species where these acts may be allowed by permit issued by the DNR. The statutes exempt the accidental, unknowing destruction of designated plants. However, it is the responsibility of the Engineer when preparing a final report to complete due diligence to avoid impacts to threatened and endangered species.

Repairs to ACD 53-62 have the potential to encounter rare plant species, specifically at Branch 5 Lateral 2 STA 64+70 to 65+30 and Branch 6 STA 41+00 to 43+00. Alternative 2 has the potential to result in a takings of a threatened plant species at Branch 6 STA 41+00 to 43+00 and may require a takings permit. It is unknown what the mitigation cost would be for the takings permit. Alternative 3 does not have the potential to result in a takings if adequate site controls are provided at Branch 5 Lateral 2 STA 64+70 to 65+30.

Construction activities must avoid impacts to the surveyed plants listed in **Appendix D**. Construction activities should follow state and federal guidance regarding timeframes for various species of concern. Construction activities may need to be phased in order to comply with all permits and plant and wildlife protection activities as applicable.

PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST

A Preliminary Opinion of Probable Construction Cost (POPCC) was developed for both alternative 2 and 3 and is included as Appendix C. Table 2 displays a summary of project costs.

Table 2: Project Costs for the Recommended Repair		
Category	**Alternative 2 Cost**	**Alternative 3 Cost**
Construction Costs	$526,667.73	$424,139.25
Engineering	$150,000	$100,000
Legal/Administrative	$25,000	$15,000.00
Contingency*	$105,333.55	$84,827.85
Total	**$807,001.28**	**$623,967.10**

*Based on 20% of construction cost

The cost estimate is based on current construction pricing and completion of the work as part of a single project. Completing the work in phases over multiple years may add additional cost to the project. Wetland impacts from Alternative 2 – Repair to ACSIC is not included in the POPCC. A total of 1.8900 wetland credits would be required for the ACSIC Repair which would be mitigated through the Browns Preserve Wetland Bank. The POPCC for Alternative 2 likewise does not include mitigation of public waters or rare species impacts, which will likely require significant additional cost.

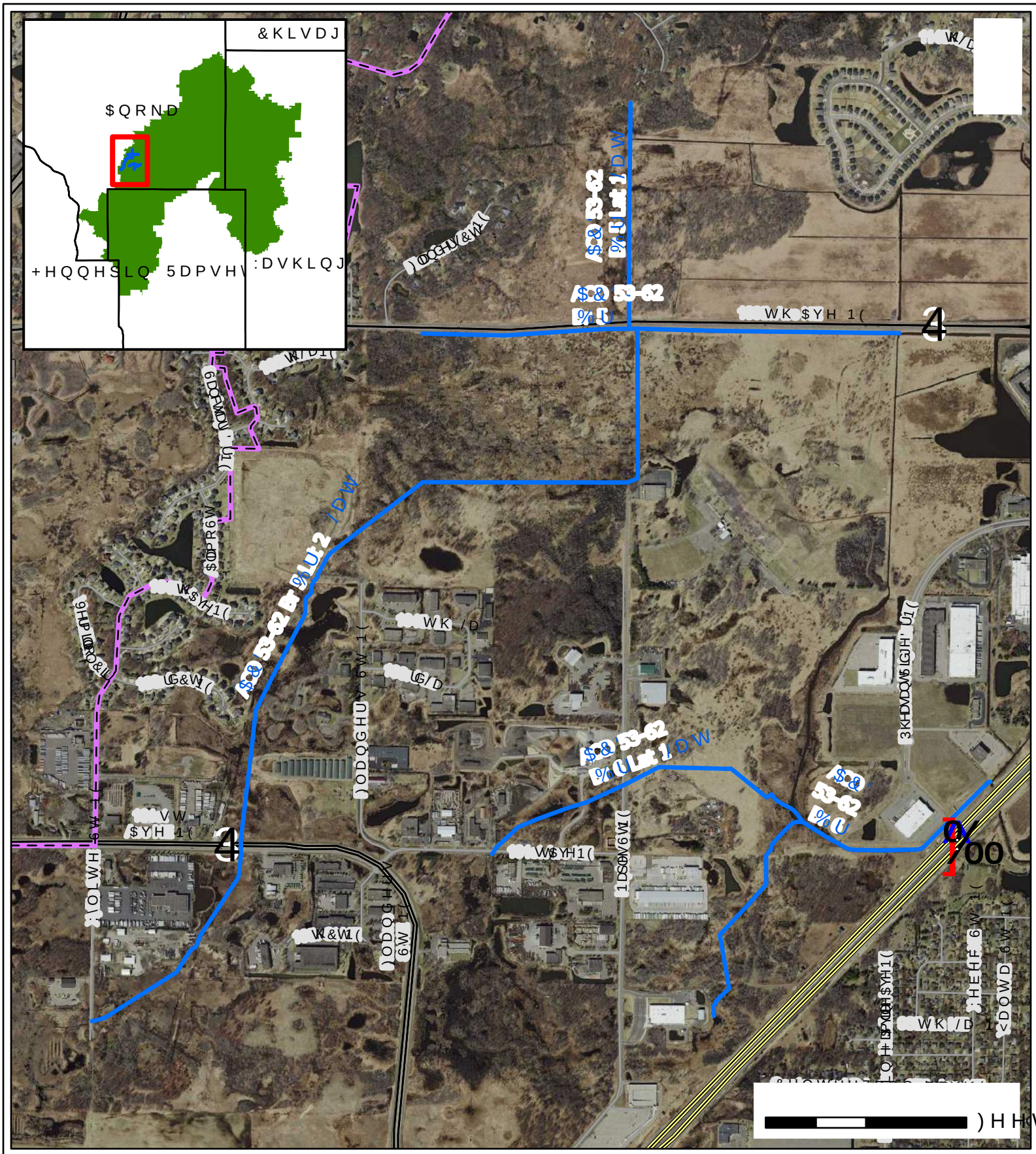
CONCLUSION / RECOMMENDATION

To restore the function of the ACD 53-62 Branches 5 and 6 public drainage system to a condition similar to the ACSIC and provide a predictable level of service, we recommend the District complete a partial repair to the functional profile, Alternative 3 – Selective Repair as depicted in **Figure 4** and the repair plan and profile within **Appendix A**. We conclude that the proposed repairs are necessary to meet the current and future stormwater management needs, and that the repairs are in the best interest of the property owners. The recommended repairs are believed to balance the need to provide serviceable drainage and stormwater management with the desire to minimize environmental impacts while implementing the best value alternative. With consideration of Minnesota Statute 103E.015, subd. 2, the project as recommended will conserve soil, water, wetlands, wildlife, and related natural resources to the maximum extent practicable while restoring and protecting the future function of the public drainage system. The drainage system serves as an outlet for commercial, industrial, residential, and municipal waters and is therefore essential to promoting public utility, benefit, and welfare.

To assist the Board of Managers, concept-level design and cost information are provided in this memorandum. Detailed construction plans, bid documents, and specifications will need to be prepared subsequent to the Board establishing and ordering a project. The Board of Managers retains the decision whether to accept, reject, or modify the Engineer's Recommendation. The repairs recommended by the Engineer are consistent with the objectives and policies identified with the adopted Watershed Management Plan approved by the Board of Water and Soil Resources.

LIST OF ATTACHMENTS

Figure 1: Project Location
Figure 2: Public Waters and Desktop Delineated Wetlands
Figure 3: Alternative 2 Repair
Figure 4: Alternative 3 Repair
Figure 5: Wetland Impact Analysis
Appendix A: Proposed Repair Plan and Profiles
Appendix B: Preliminary Opinion of Probable Construction Cost
Appendix C: NHIS Review
Appendix D: Rare Species Survey Results



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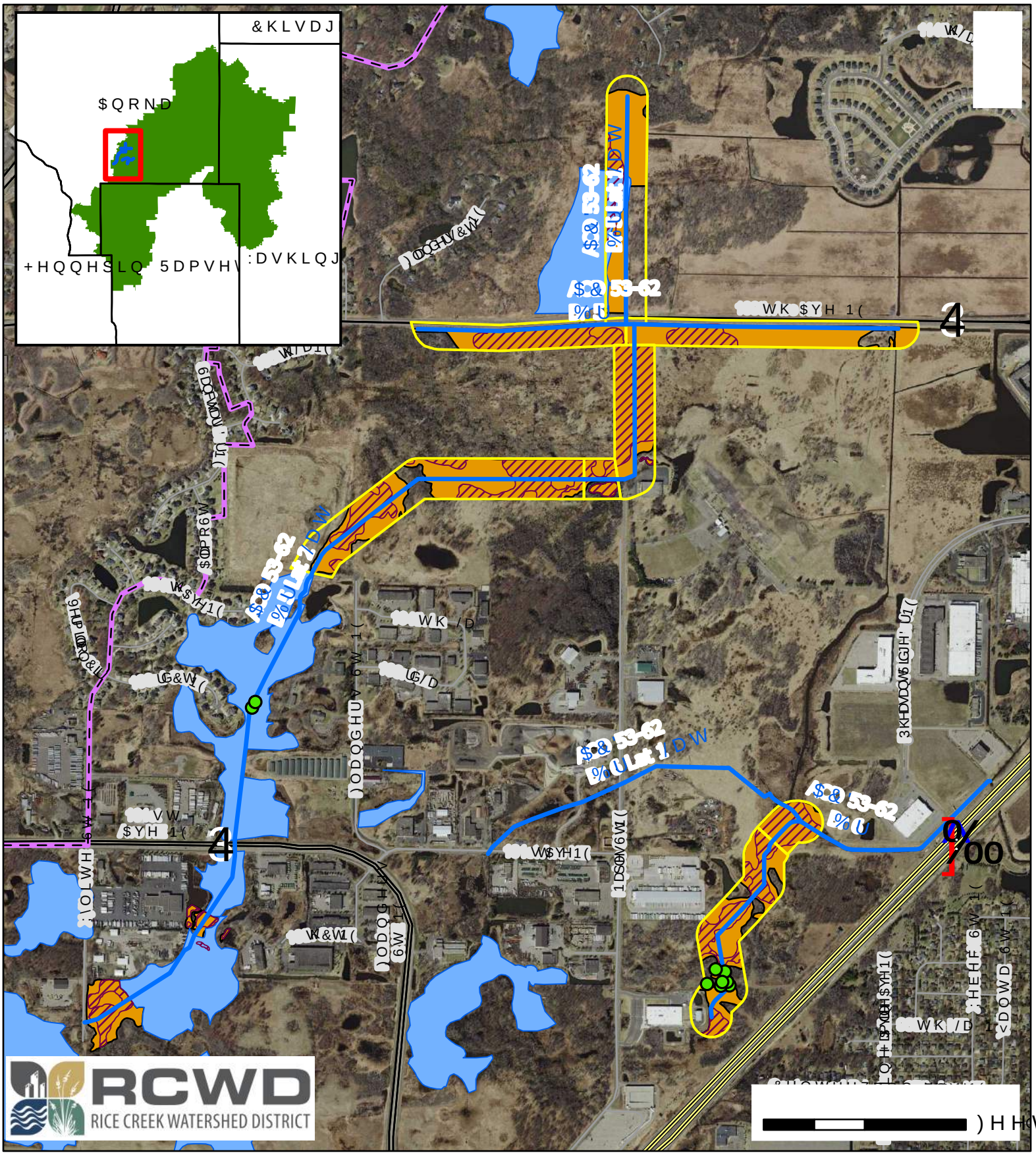
RCWD RICE CREEK WATERSHED DISTRICT

HOUSTON engineering, inc.



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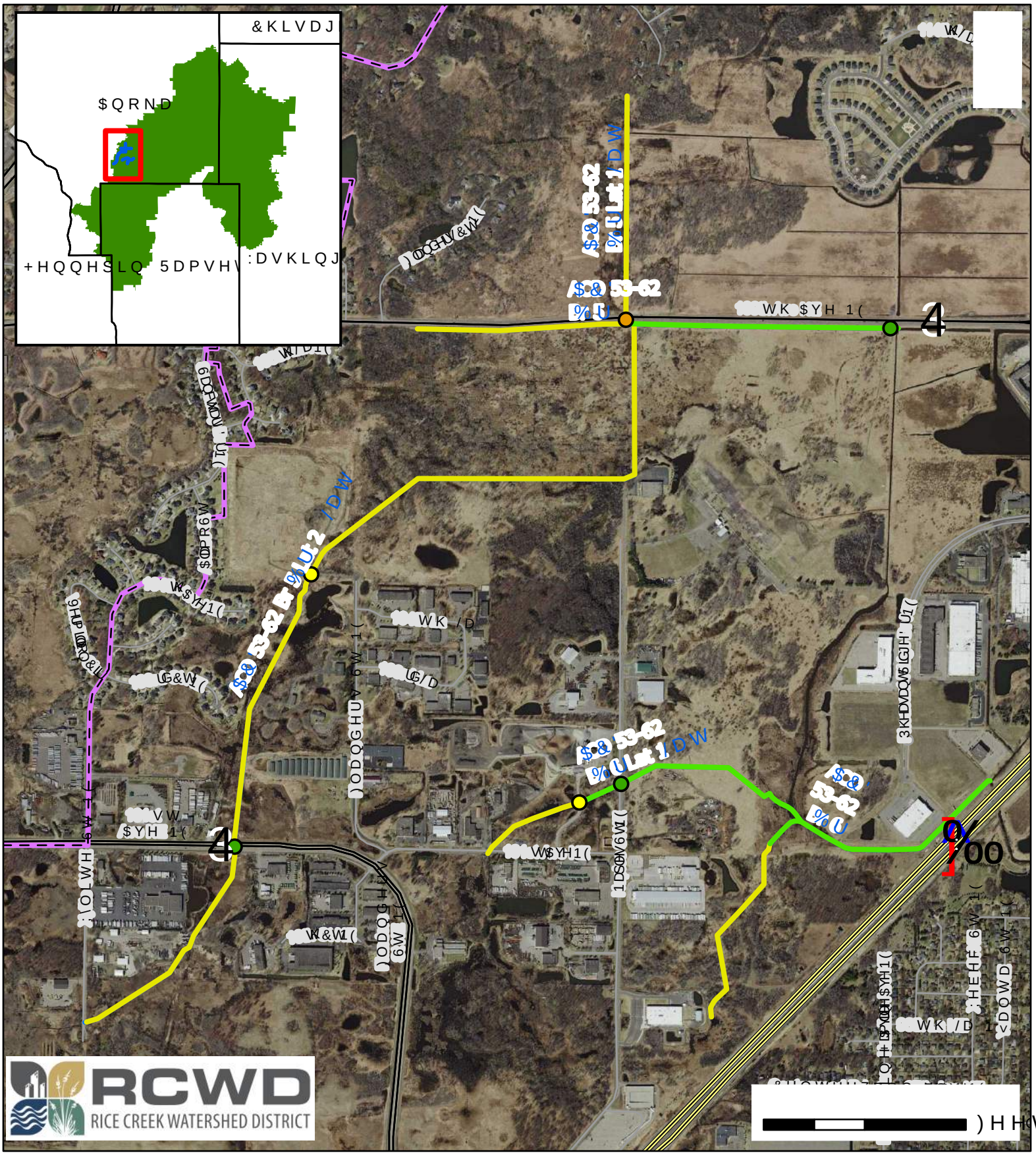
HOUSTON engineering, inc.



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,QVWDOO 1HZ &XOYHUW

1R 5HSDLU WR &XOYHUW

)LJXUH $&' %UDQFKHV DQG $OWHUQDWLYH 5HSDLUV

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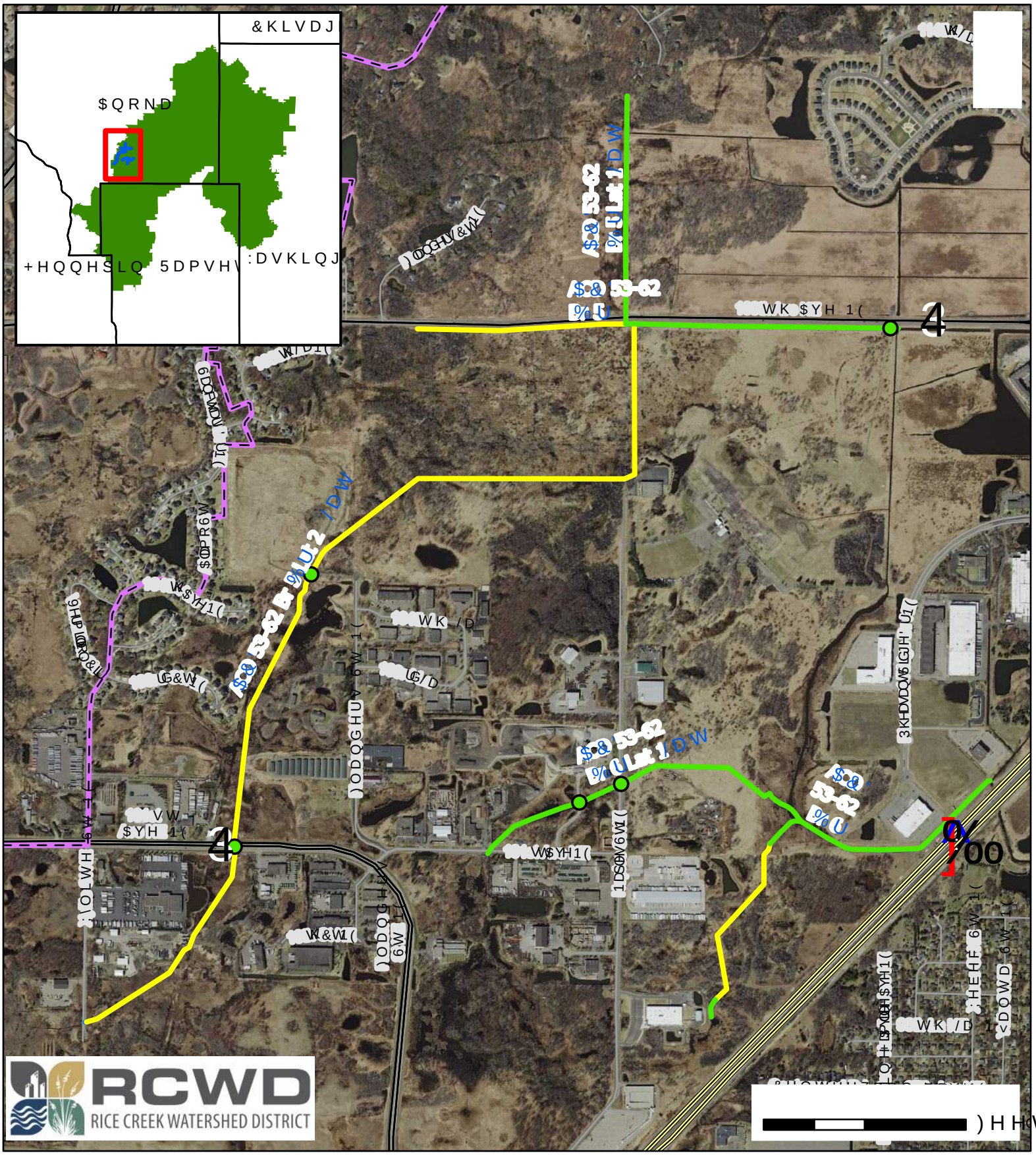
HOUSTON engineering, inc.



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)LJXUH $&' %UDQFKHV DQG $OWHUQDWLYH 5HSDLUV

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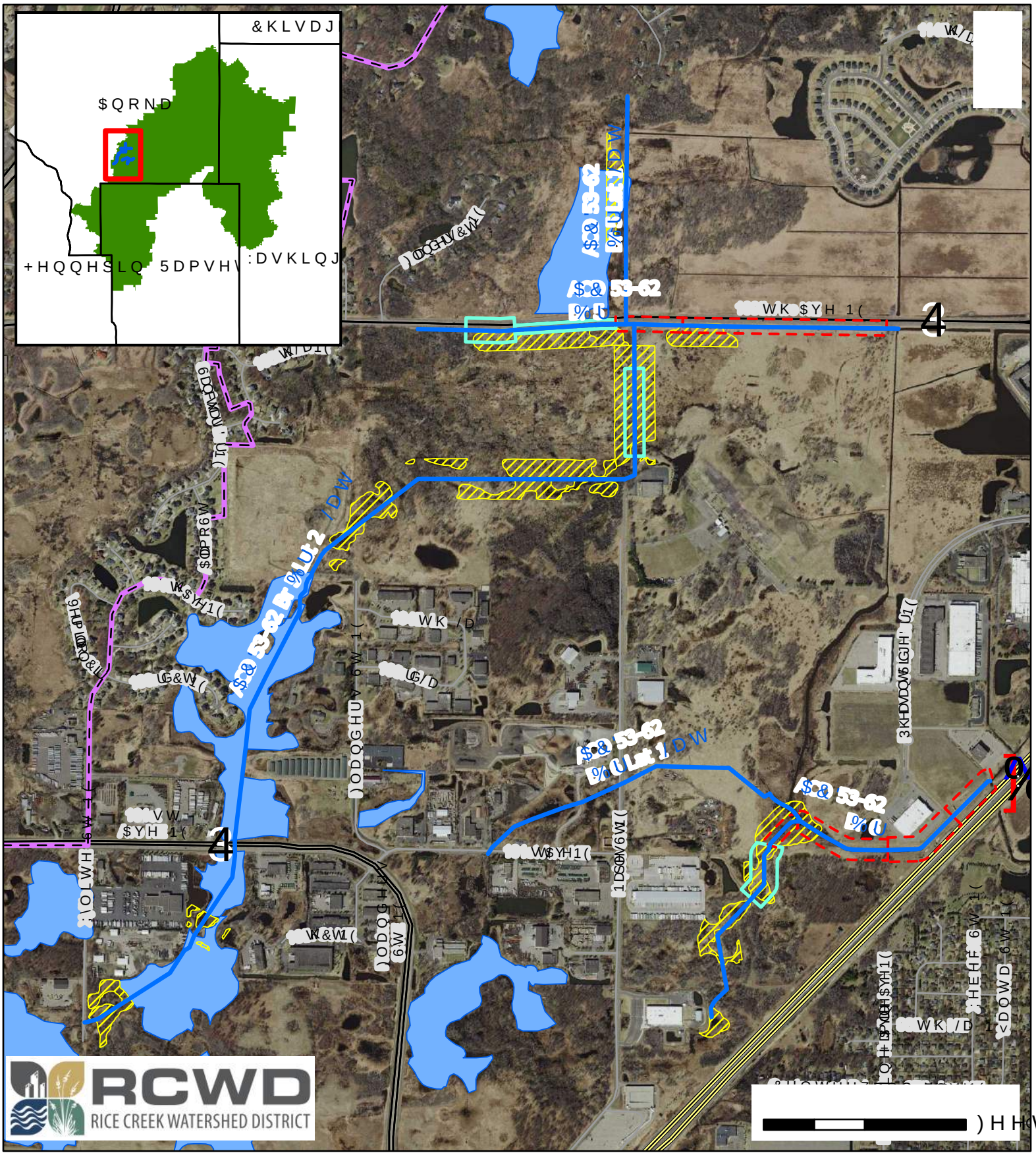
$6 6+2:1	.5% &22

HOUSTON engineering, inc.



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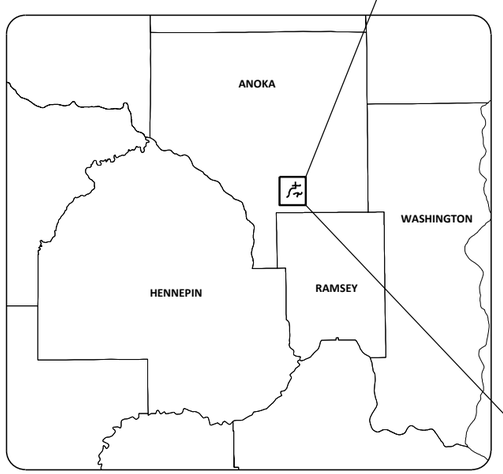
APPENDIX A: PROPOSED REPAIR PLAN AND PROFILES

RICE CREEK WATERSHED DISTRICT
ACD 53-62 BRANCH 5 & 6 REPAIR

RICE CREEK WATERSHED DISTRICT
JULY, 2024

HOUSTON engineering, inc.
7550 MERIDIAN CIR N
SUITE 120
MAPLE GROVE, MN 55369
P: 763.493.4522
T: 1.866.319.2040
www.houstoneng.com



VICINITY MAP

LOCATION MAP

SURVEY INFORMATION:

HORIZONTAL DATUM: NAD 83
VERTICAL DATUM: NAVD 88
COORDINATE SYSTEM: MINNESOTA STATE PLANE SOUTH ZONE
UNIT OF MEASURE: US SURVEY FOOT
PROJECT BENCHMARK:

UTILITY NOTE:

PRIOR TO ANY EXCAVATION WORK, THE CONTRACTOR IS RESPONSIBLE UNDER MINNESOTA STATE STATUE 216D AND MINNESOTA RULES CHAPTER 7560 TO CONTACT GOPHER STATE ONE CALL FOR THE LOCATION OF UNDERGROUND UTILITY FACILITIES IN PROXIMITY TO THE EXCAVATION SITE.

CONTACT "GOPHER STATE ONE CALL" FOR LOCATIONS OF BURIED UTILITIES. CALL (651) 454-0002 OR (800) 252-1166.
ALSO CONTACT AT www.gopherstateonecall.org

PRELIMINARY
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Project No. 5555-0347

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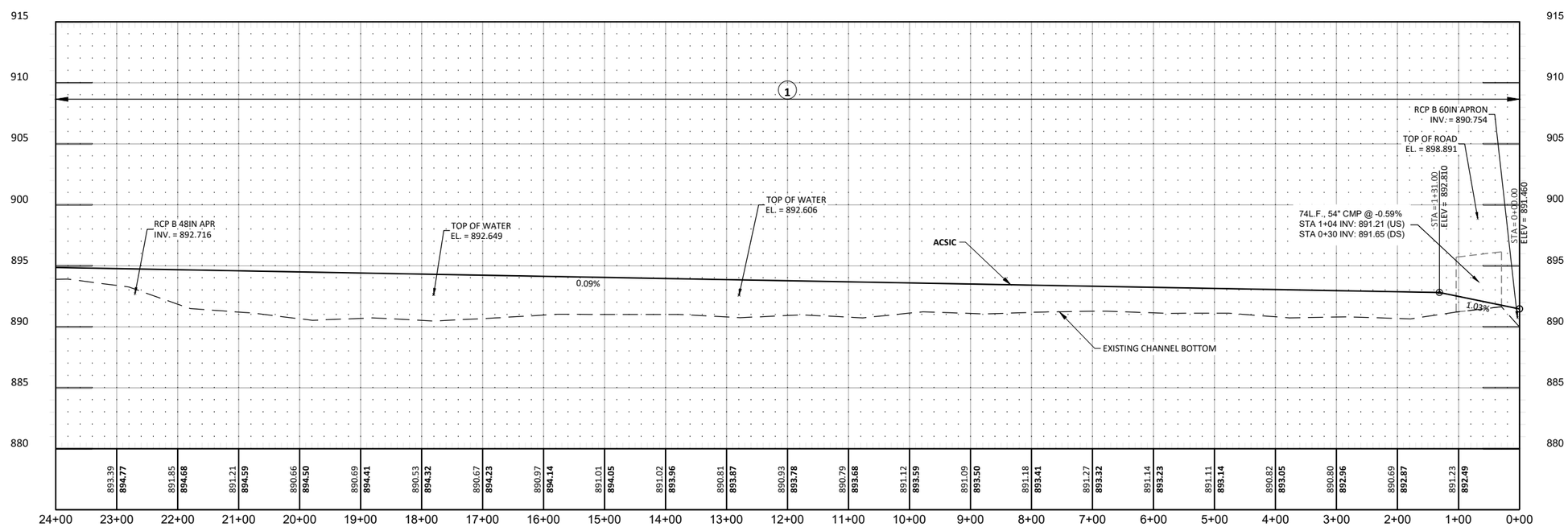

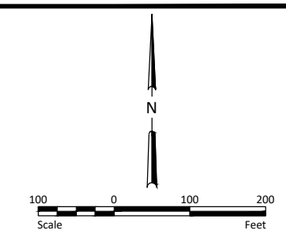

NOTES

1. HORIZONTAL CONTROL: ANY COORDINATES LISTED IN THIS PLAN MINNESOTA STATE PLANE, SOUTH ZONE, US FOOT.
2. VERTICAL CONTROL: ALL ELEVATIONS ARE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).

LEGEND

NO WORK (1)

LEGEND FOR PROFILE ELEVATIONS

EXISTING SURVEYED PROFILE → 897.94 / 896.46 ← ACSIC

70+00

No.	Revision	Date	By

PRELIMINARY
NOT FOR CONSTRUCTION

HOUSTON engineering, inc.

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ACD 53-62 BRANCH 5 & 6 REPAIR

RICE CREEK WATERSHED DISTRICT

BRANCH 5 PLAN & PROFILE

PROJECT NO. 5555-0347

SHEET 2

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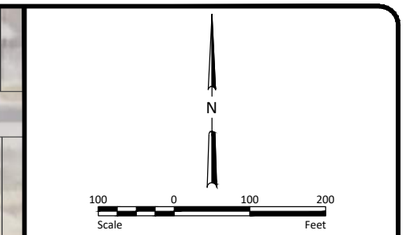

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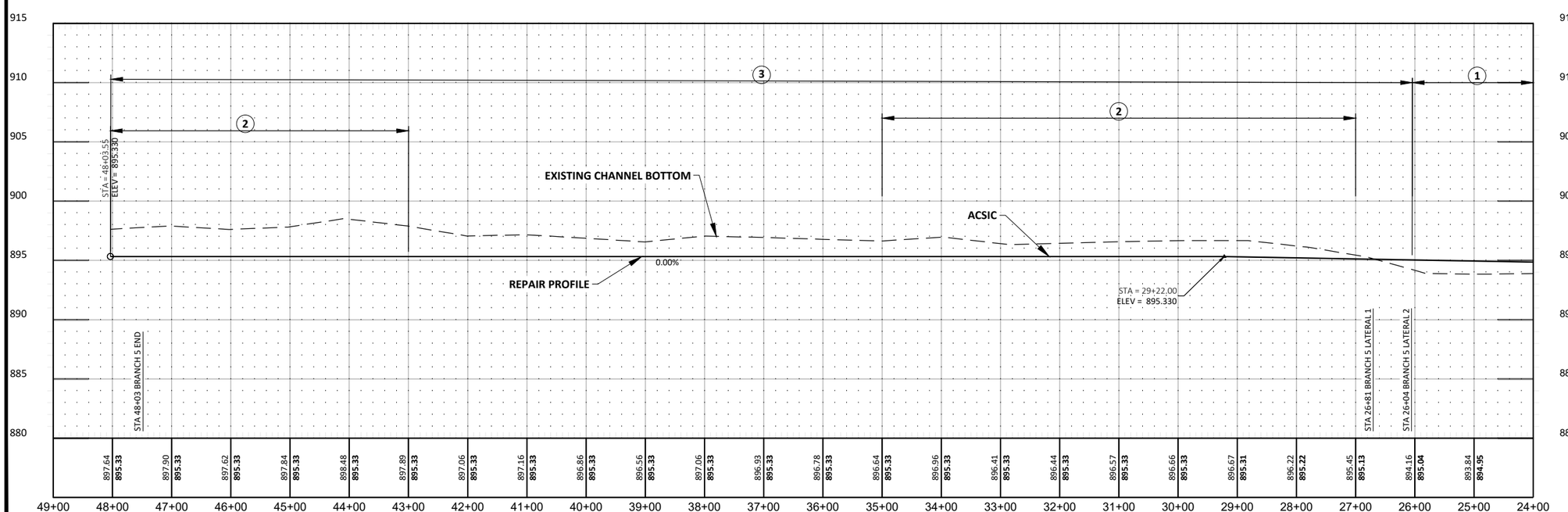
TREE, BRUSH, AND WOODY VEGETATION CLEARING AND REMOVAL	2
DITCH EXCAVATION	3



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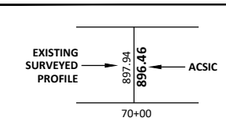

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ACD 53-62 BRANCH 5 & 6 REPAIR

RICE CREEK WATERSHED DISTRICT

BRANCH 5 PLAN & PROFILE

PROJECT NO. 5555-0347

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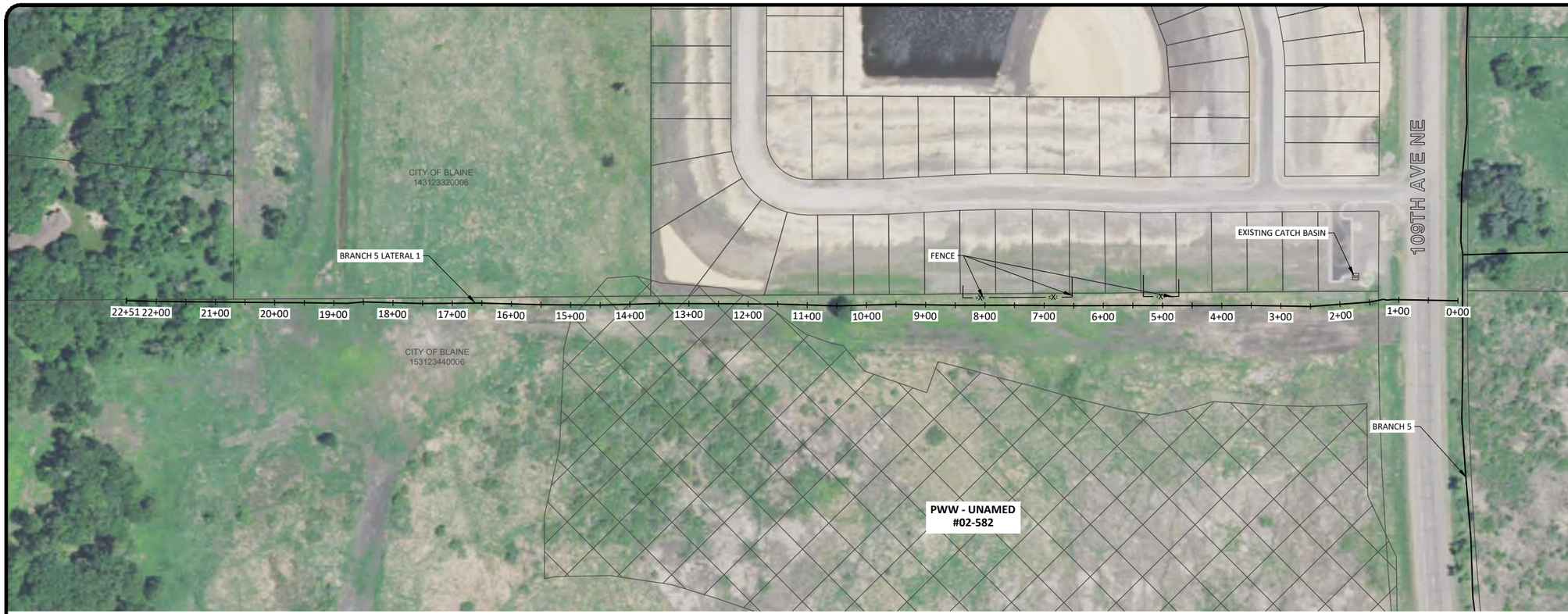

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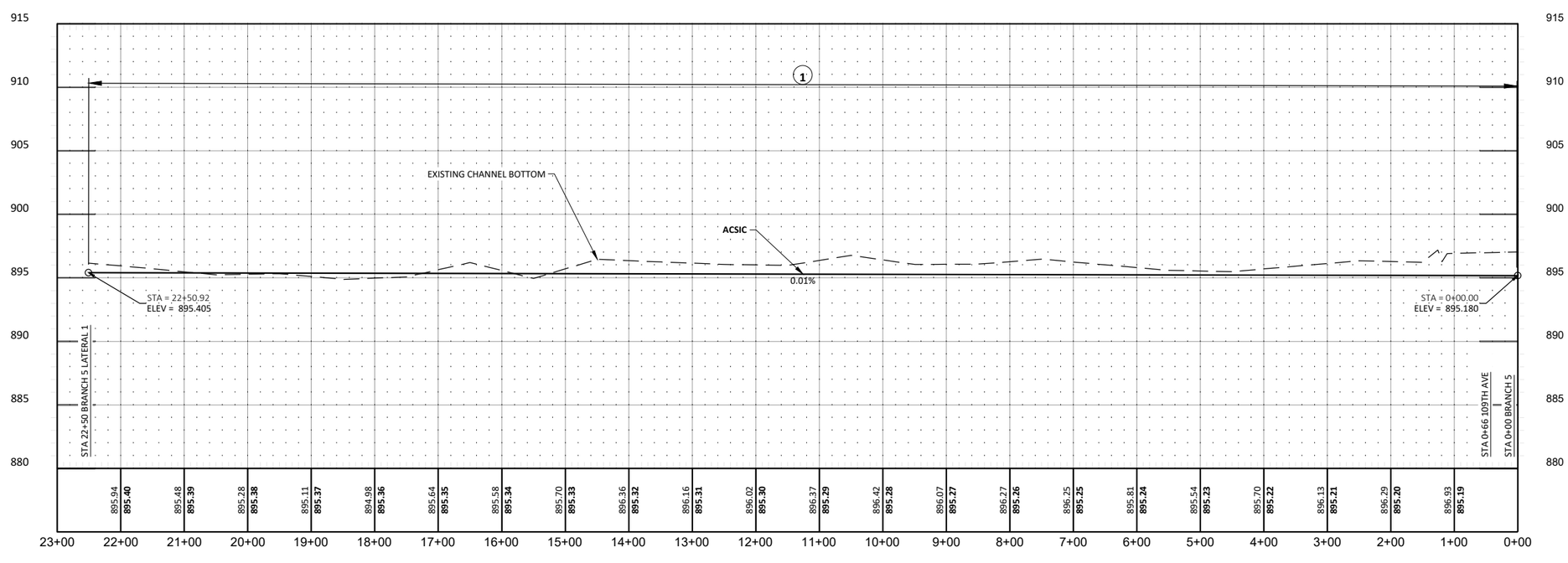

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EXISTING SURVEYED PROFILE → 897.94 / 896.46 ← ACSIC

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ACD 53-62 BRANCH 5 & 6 REPAIR

RICE CREEK WATERSHED DISTRICT

BRANCH 5 LATERAL 1 PLAN & PROFILE

PROJECT NO. 5555-0347

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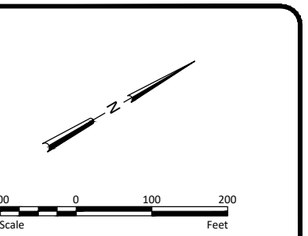

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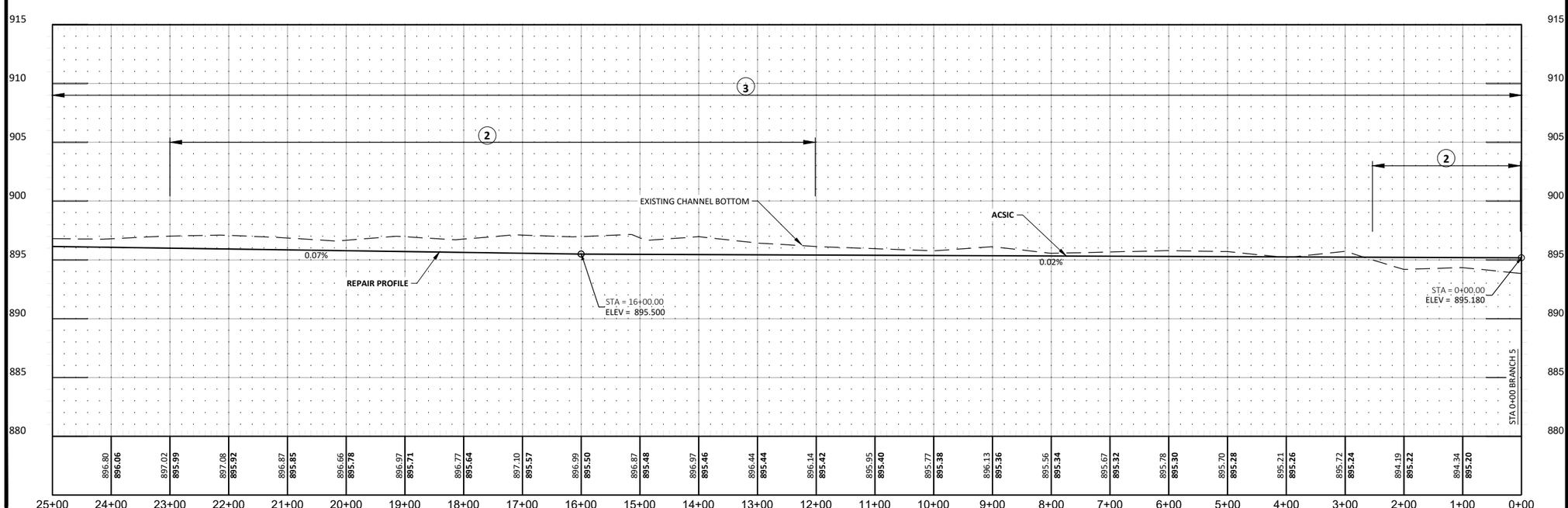
DITCH EXCAVATION	3



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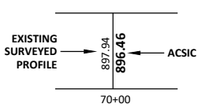

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ACD 53-62 BRANCH 5 & 6 REPAIR

RICE CREEK WATERSHED DISTRICT

BRANCH 5 LATERAL 2 PLAN & PROFILE

PROJECT NO. 5555-0347

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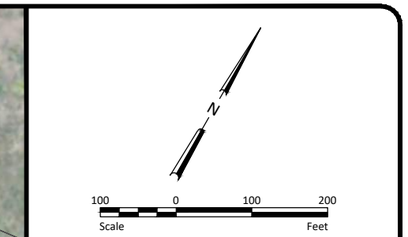

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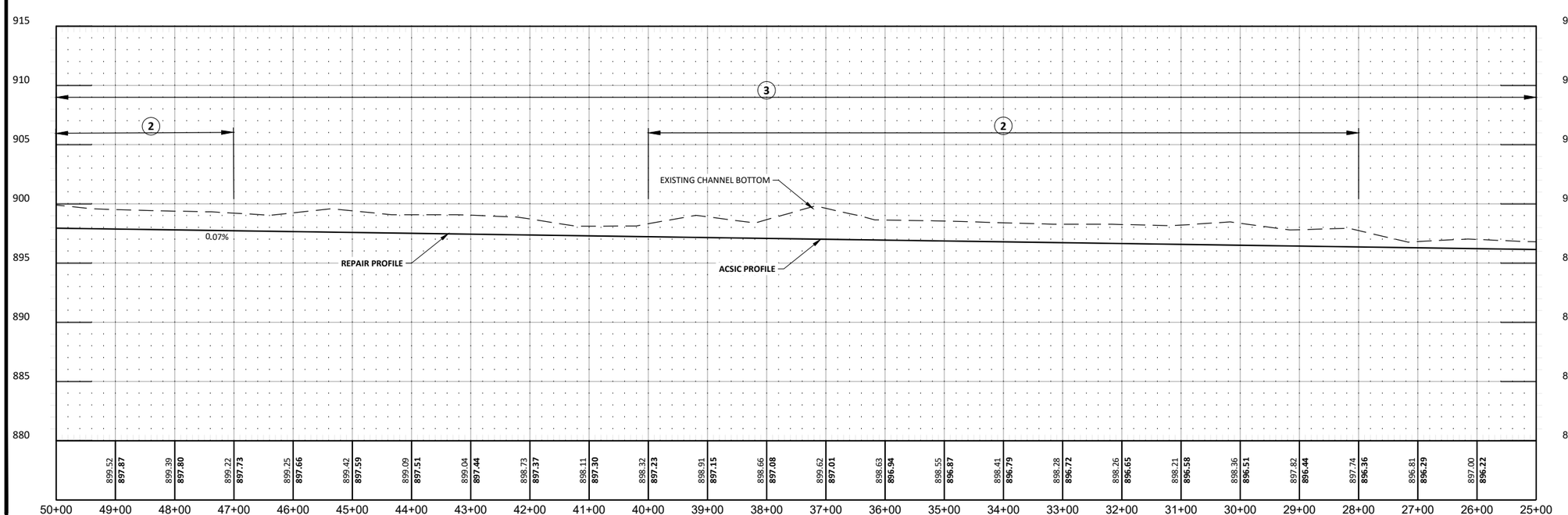
LEGEND

TREE, BRUSH, AND WOODY VEGETATION CLEARING AND REMOVAL	2
DITCH EXCAVATION	3



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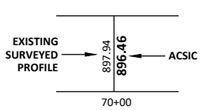

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ACD 53-62 BRANCH 5 & 6 REPAIR

RICE CREEK WATERSHED DISTRICT

BRANCH 5 LATERAL 2 PLAN & PROFILE

PROJECT NO. 5555-0347

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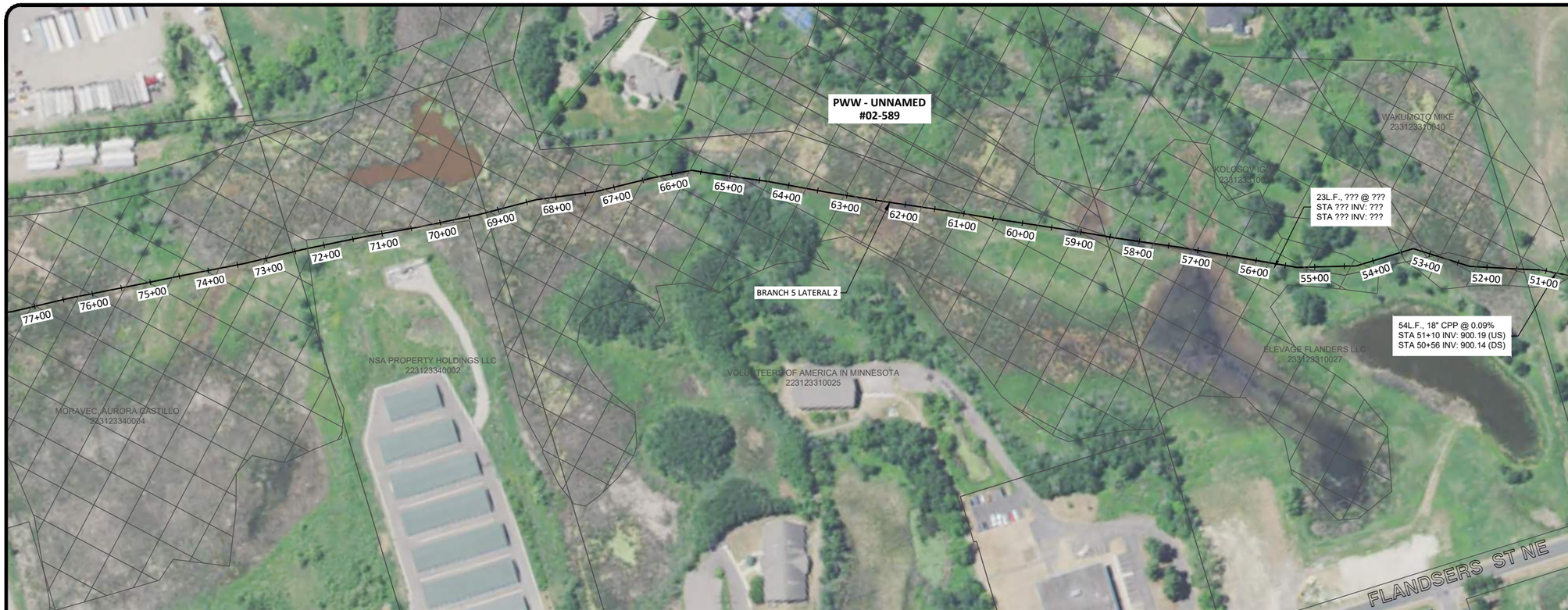

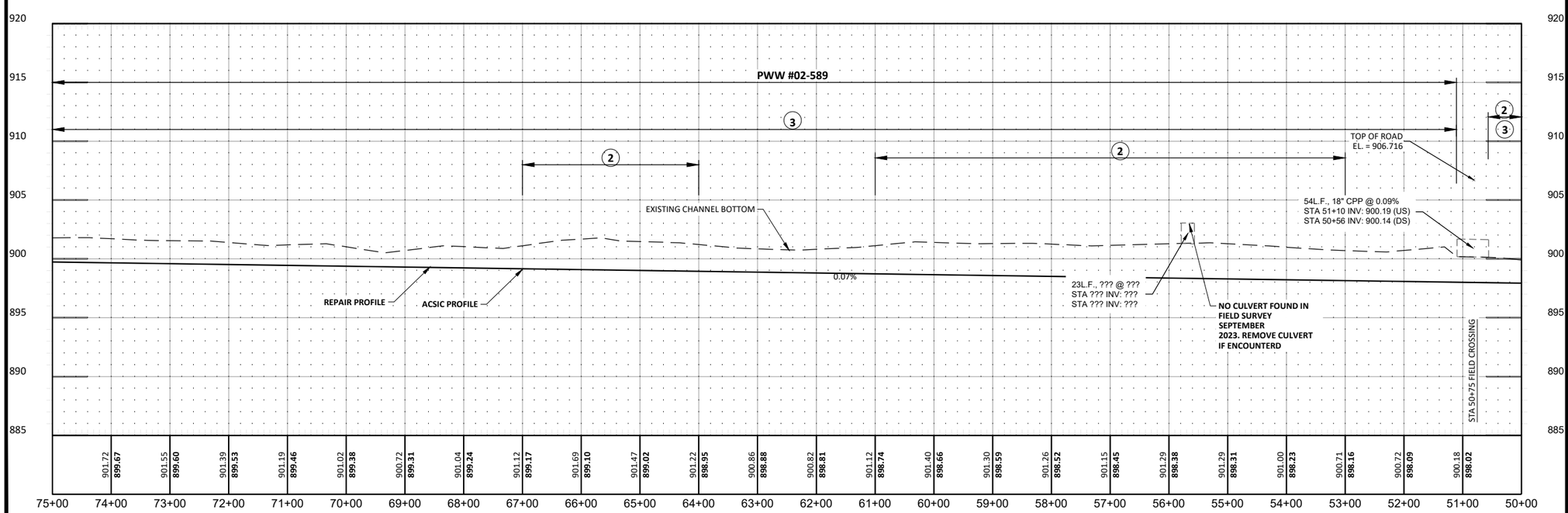

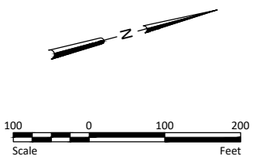

NOTES

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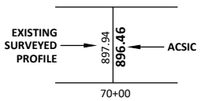
LEGEND

TREE, BRUSH, AND WOODY VEGETATION CLEARING AND REMOVAL	2
DITCH EXCAVATION	3

LEGEND FOR PROFILE ELEVATIONS



No.	Revision	Date	By

PRELIMINARY
NOT FOR CONSTRUCTION

HOUSTON engineering, inc.

Drawn by	Date
IRR	7-23-2024
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ACD 53-62 BRANCH 5 & 6 REPAIR

RICE CREEK WATERSHED DISTRICT

BRANCH 5 LATERAL 2 PLAN & PROFILE

PROJECT NO. 5555-0347

SHEET 7

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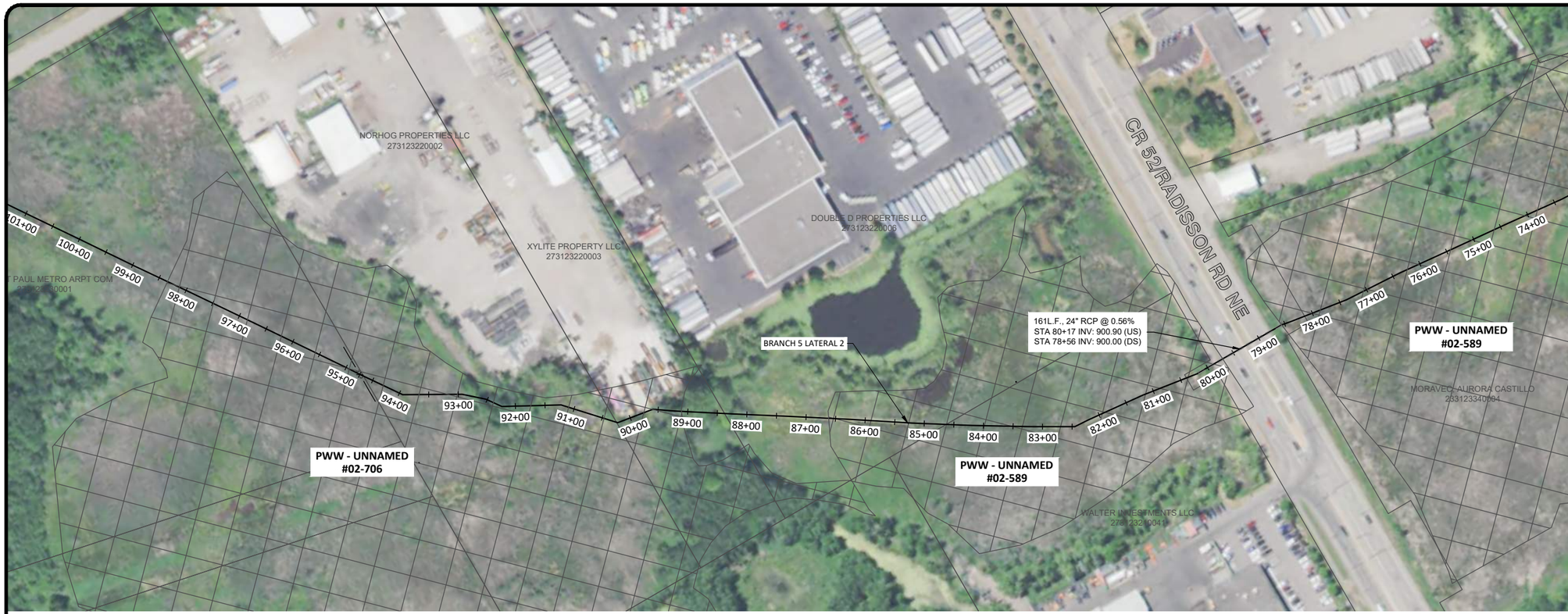

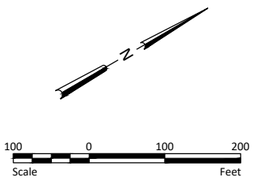

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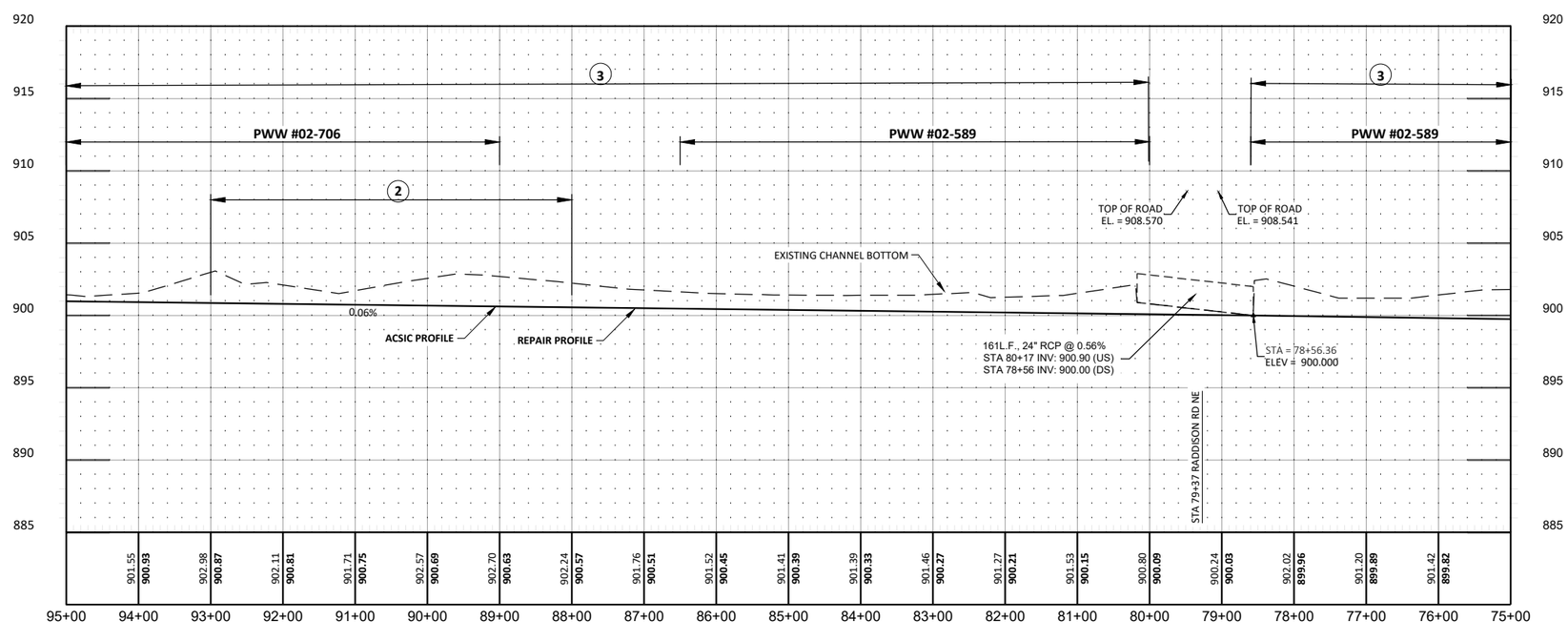
LEGEND

TREE, BRUSH, AND WOODY VEGETATION CLEARING AND REMOVAL	2
DITCH EXCAVATION	3



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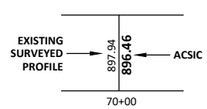

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PRELIMINARY
NOT FOR CONSTRUCTION

HOUSTON engineering, inc.

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ACD 53-62 BRANCH 5 & 6 REPAIR

RICE CREEK WATERSHED DISTRICT

BRANCH 5 LATERAL 2 PLAN & PROFILE

PROJECT NO. 5555-0347

SHEET 8

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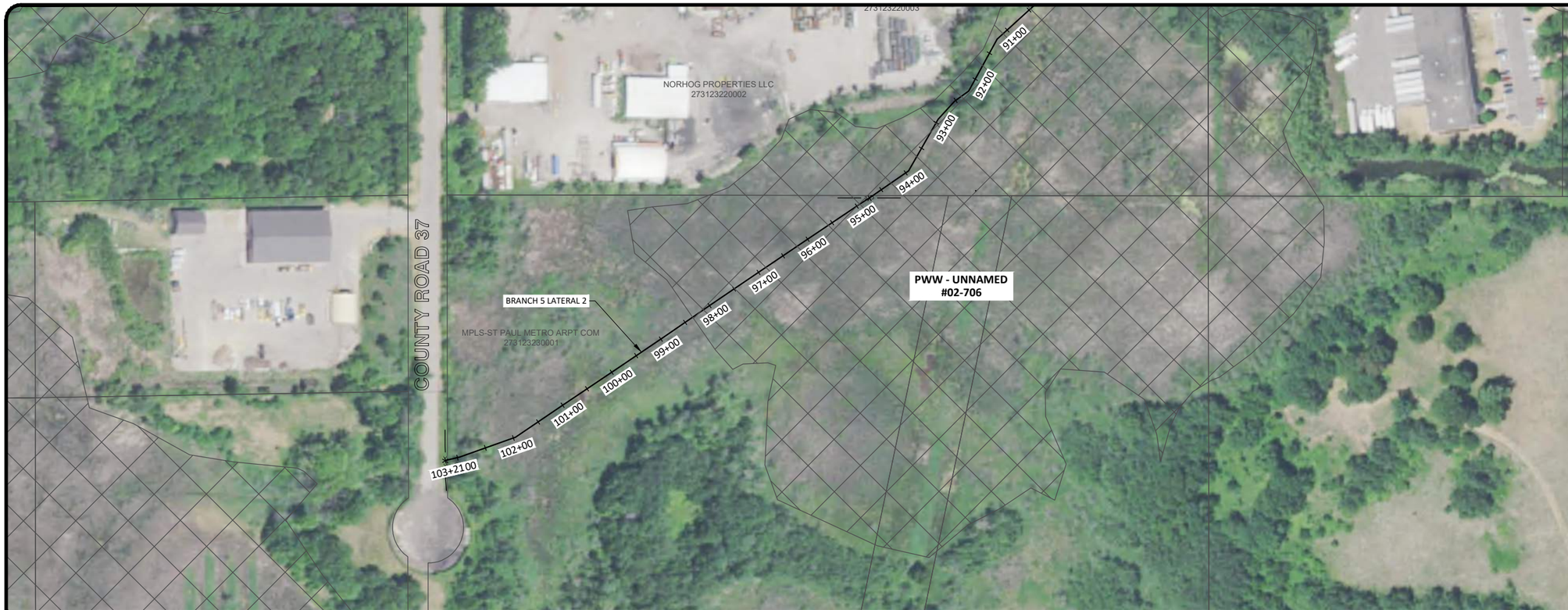

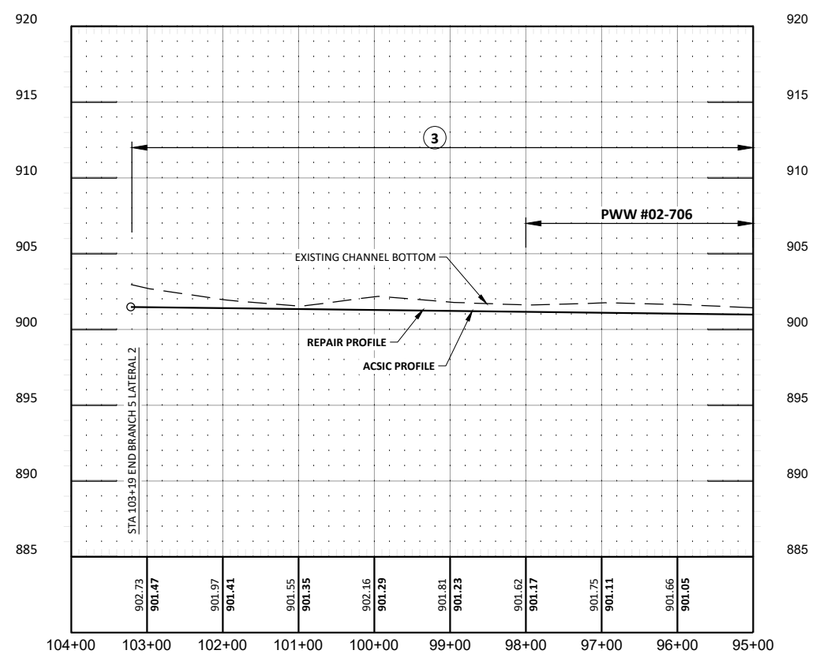

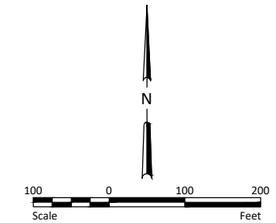

NOTES

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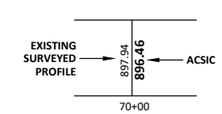
LEGEND

DITCH EXCAVATION (3)

LEGEND FOR PROFILE ELEVATIONS



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NOT FOR CONSTRUCTION

HOUSTON engineering, inc.

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ACD 53-62 BRANCH 5 & 6 REPAIR

RICE CREEK WATERSHED DISTRICT

BRANCH 5 LATERAL 2 PLAN & PROFILE

PROJECT NO. 5555-0347

SHEET 9

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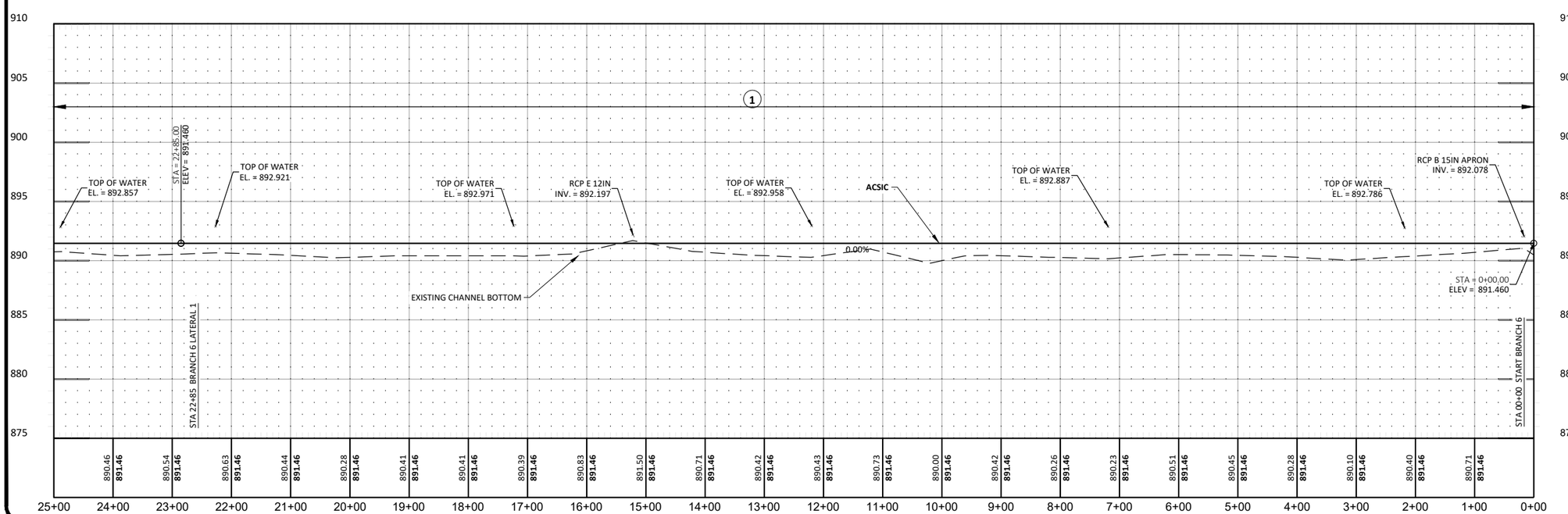

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LEGEND

NO WORK (1)

LEGEND FOR PROFILE ELEVATIONS

EXISTING SURVEYED PROFILE → 897.94 / 896.46 ← ACSIC

70+00

No.	Revision	Date	By

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NOT FOR CONSTRUCTION

HOUSTON engineering, inc.

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ACD 53-62 BRANCH 5 & 6 REPAIR

RICE CREEK WATERSHED DISTRICT

BRANCH 6 PLAN & PROFILE

PROJECT NO. 5555-0347

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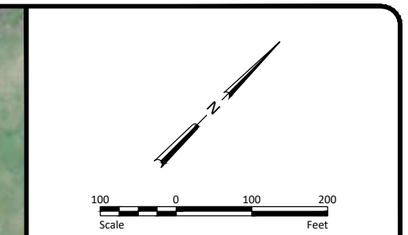

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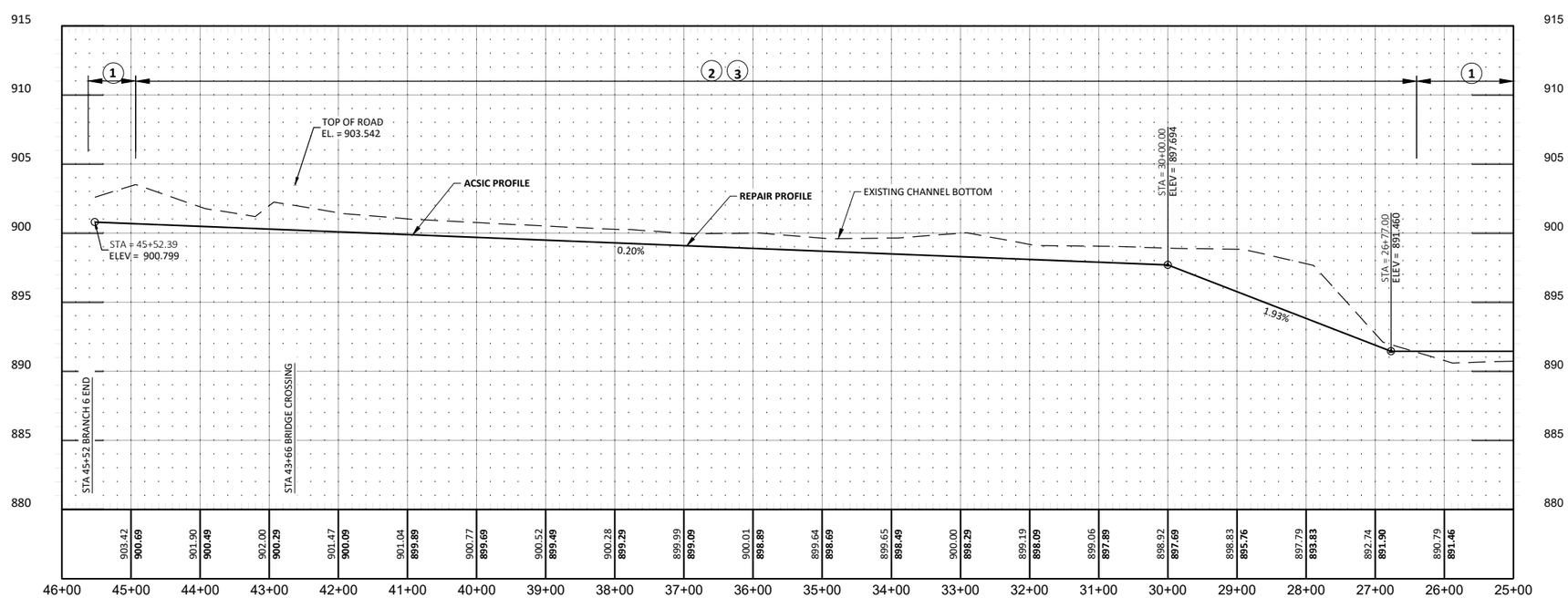
LEGEND

NO WORK	1
TREE, BRUSH, AND WOODY VEGETATION CLEARING AND REMOVAL	2
DITCH EXCAVATION	3



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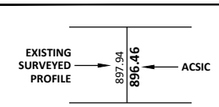

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HOUSTON engineering, inc.

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ACD 53-62 BRANCH 5 & 6 REPAIR

RICE CREEK WATERSHED DISTRICT

BRANCH 6 PLAN & PROFILE

PROJECT NO. 5555-0347

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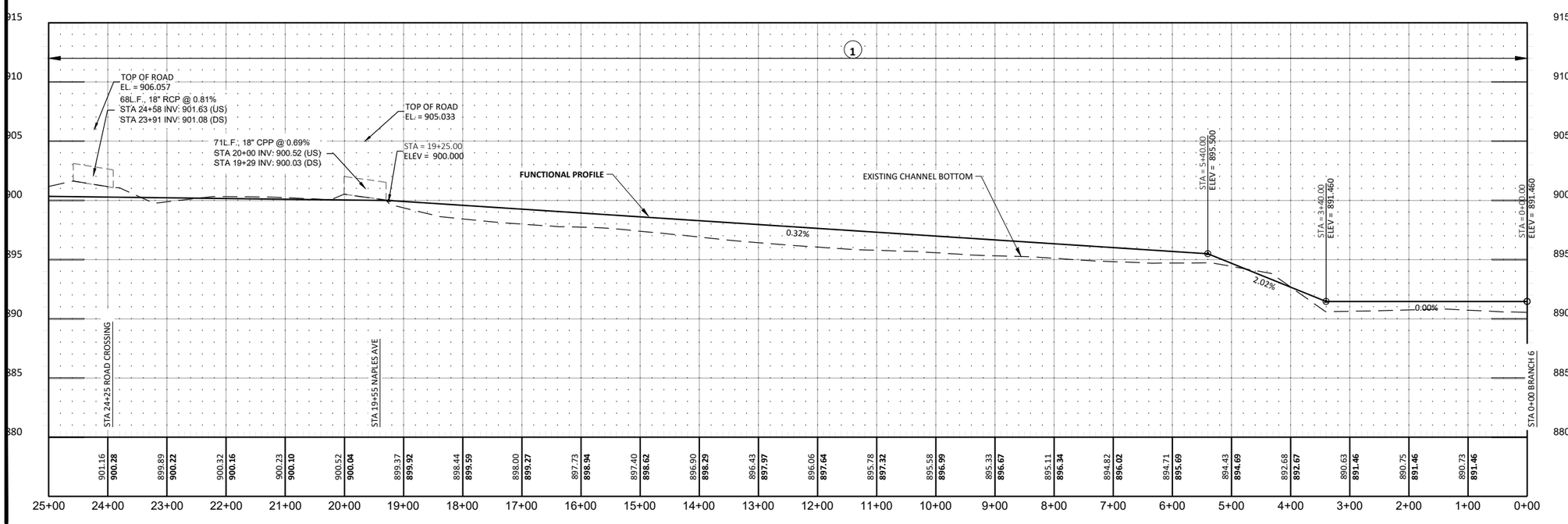

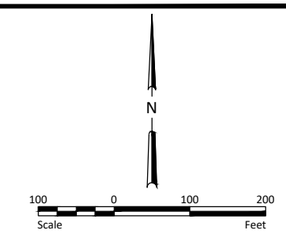

NOTES

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LEGEND

NO WORK (1)

LEGEND FOR PROFILE ELEVATIONS

EXISTING SURVEYED PROFILE → 897.94 / 896.46 ← ACSIC

70+00

No.	Revision	Date	By

PRELIMINARY
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HOUSTON engineering, inc.

Drawn by	Date
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ACD 53-62 BRANCH 5 & 6 REPAIR

RICE CREEK WATERSHED DISTRICT

BRANCH 6 LATERAL 1 PLAN & PROFILE

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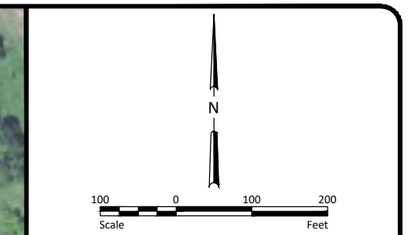

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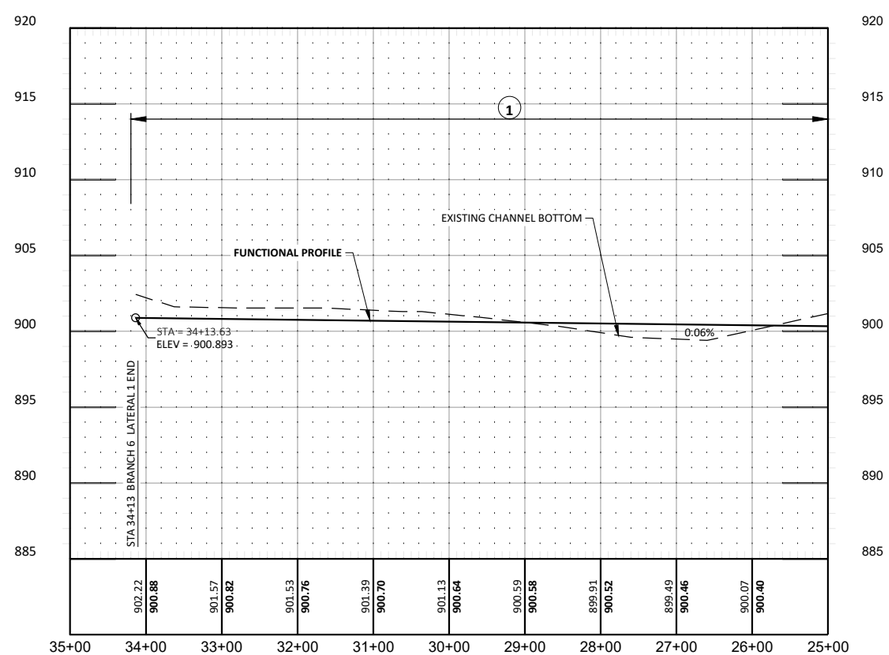
LEGEND

NO WORK (1)



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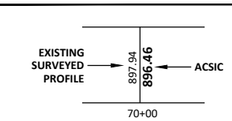

No.	Revision	Date	By

PRELIMINARY
NOT FOR CONSTRUCTION

HOUSTON engineering, inc.

Drawn by	Date
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ACD 53-62 BRANCH 5 & 6 REPAIR

RICE CREEK WATERSHED DISTRICT

BRANCH 6 LATERAL 1 PLAN & PROFILE

PROJECT NO. 5555-0347

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APPENDIX B: PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COST

Appendix B. Preliminary Opinion of Probably Construction Cost Alternative 2

Description	Units	Unit Price	Est'd Quantity	Extension
Mobilization	Lump Sum	$30,000	1	$30,000.00
Traffic Control	Lump Sum	$5,000	1	$5,000.00
Excavation of Open Channel	Linear Foot	$10	17544	$175,440.00
Spoil Management	Linear Foot	$6	17544	$105,264.00
Tree Clearing, Chipping and Removal	Acre	$15,000	7.4	$110,595.73
Remove & Dispose of Inplace Culvert	Each	$2,000	3	$6,000.00
12" RCP	LF	$101	110	$11,088.00
18" RCP	LF	$105	72	$7,560.00
18" CPP	LF	$45	70	$3,150.00
Bituminous Patch	Each	$5,000	2	$10,000.00
Construction Matting	Lump Sum	$20,000	1	$20,000.00
Seeding and Mulch	Acre	$3,000	12	$36,270.00
Silt Fence	Linear Foot	$5	100	$500.00
Sediment Control Log	Linear Foot	$4	100	$400.00
Erosion Control Blanket Cat. 3	Square Yard	$4	100	$400.00
SWPPP Documentation & Reporting	Lump Sum	$5,000	1	$5,000.00
			Construction Cost Total	**$526,667.73**
			Engineering	$ 150,000.00
			Legal/Admin (Fixed Fee)	$25,000.00
			Construction Contingency (20%)	$105,333.55
			TOTAL PROJECT COST	**$807,001.28**

Appendix B. Preliminary Opinion of Probably Construction Cost Alternative 3

Description	Units	Unit Price	Est'd Quantity	Extension
Mobilization	Lump Sum	$30,000	1	$30,000.00
Excavation of Open Channel	Linear Foot	$10	14286	$142,860.00
Spoil Management	Linear Foot	$6	14286	$85,716.00
Tree Clearing, Chipping and Removal	Acre	$15,000	7.2	$108,643.25
Remove & Dispose of Inplace Culvert	Each	$2,000	1	$2,000.00
Construction Matting	Lump Sum	$20,000	1	$20,000.00
Seeding and Mulch	Acre	$3,000	10	$29,520.00
Erosion Control Blanket Cat. 3	Square Yard	$4	100	$400.00
SWPPP Documentation & Reporting	Lump Sum	$5,000	1	$5,000.00
			Construction Cost Total	**$424,139.25**
			Engineering	$ 100,000.00
			Legal/Admin (Fixed Fee)	$15,000.00
			Construction Contingency (20%)	$84,827.85
			TOTAL PROJECT COST	**$623,967.10**

APPENDIX C: DNR NATURAL HERITAGE REVIEW

Minnesota Department of Natural Resources
Division of Ecological & Water Resources
500 Lafayette Road, Box 25
St. Paul, MN 55155-4025

April 26, 2024

Isabella Reeve
Houston Engineering, Inc.

RE: Natural Heritage Review of the proposed **Anoka County Ditch 53-62 Branch 5&6 Repair,**
T31N R23W Sections 15, 22, 23, 26, 27, & 28; Anoka County

Dear Isabella Reeve,

For all correspondence regarding the Natural Heritage Review of this project please include the project ID **MCE-2024-00235** in the email subject line.

As requested, the Minnesota Natural Heritage Information System has been reviewed to determine if the proposed project has the potential to impact any rare species or other significant natural features. Based on the project details provided with the request, the following rare features may be impacted by the proposed project:

State-listed Species

- A dozen unique state-listed endangered and threatened plant species have been documented in the vicinity of the proposed project. Minnesota's Endangered Species Statute (Minnesota Statutes, section 84.0895) and associated Rules (Minnesota Rules, part 6212.1800 to 6212.2300 and 6134) prohibit the take of endangered or threatened plants or animals, including their parts or seeds, without a permit. **To demonstrate avoidance, a qualified surveyor will need to determine if suitable habitat exists within the activity impact area and, if so, conduct a survey prior to any project activities.**

  Surveys must be conducted by a qualified surveyor and follow the standards contained in the Rare Species Survey Process and Rare Plant Guidance. Visit the Natural Heritage Review page for a list of certified surveyors and more information on this process. Project planning should take into account that any botanical survey needs to be conducted during the appropriate time of the year, which may be limited. Please consult with the NH Review Team at Review.NHIS@state.mn.us if you have any questions regarding this process.

- Blanding's turtles (*Emydoidea blandingii*), a state-listed threatened species, have been documented in the vicinity of the proposed project. Blanding's turtles use upland areas up to and over a mile distant from wetlands, waterbodies, and watercourses. Uplands are used for nesting, basking, periods of dormancy, and traveling between wetlands. Factors believed to contribute to the decline of this species include collisions with vehicles, wetland drainage and degradation, and the development of upland habitat. Any added mortality can be detrimental to populations of Blanding's turtles, as these turtles have a low reproduction rate that depends upon a high survival rate to maintain population levels.

  This project has the potential to impact this rare turtle through direct fatalities and habitat disturbance/destruction due to excavation, fill, and other construction activities associated with the project. Minnesota's Endangered Species Statute (Minnesota Statutes, section 84.0895) and associated Rules (Minnesota Rules, part 6212.1800 to 6212.2300 and 6134) prohibit the take of threatened or endangered species without a permit. As such, **the following avoidance measures are required**:

  - Avoid wetland and aquatic impacts during hibernation season, between September 15 and April 15, if the area is suitable for hibernation.
  - If applicable, permanent riprap must have voids filled with gravel, soil, or other material between large stones to avoid entrapping turtles and to maintain connectivity between aquatic and upland habitat. For an example, reference vegetation riprap as described in Best Practices for Meeting DNR General Public Waters Work Permit GP 2004-0001 (state.mn.us) Chapter 1, Page 33
  - Limit erosion and sediment control to wildlife friendly erosion control to avoid the inadvertent take of Blanding's turtles.
  - Avoid hydro-mulch products that contain any materials with synthetic (plastic) fiber additives, as the fibers can re-suspend and flow into waterbodies.
  - The Blanding's turtle flyer must be given to all contractors working in the area.
  - Check bare ground within construction areas for turtles before the use of heavy equipment or any ground disturbance.
  - Report any sightings to Reports.NHIS@state.mn.us; please include date, observer, location, and photograph of the Blanding's turtle.
  - If turtles are in imminent danger, move them by hand out of harm's way; otherwise, they are to be left undisturbed. Directions on how to move turtles safely can be found at Helping Turtles Across the Road.

  Please refer to the Blanding's turtle fact sheet for additional recommendations (both lists) that may be relevant to your project.

Please contact Review.NHIS@state.mn.us **to confirm that the above avoidance measures will be implemented or to inform us that they are not feasible.** If the measures are not feasible, a project-specific avoidance plan will likely be needed.

- Wilson's phalarope (*Phalaropus tricolor*), a state-listed threatened bird, has been documented during the breeding season in the vicinity of the proposed project. This wetland species nests on the ground in wet meadows, grassy marshes, and along edges of shallow inland waters. Minnesota's Endangered Species Statute (Minnesota Statutes, section 84.0895) and associated Rules (Minnesota Rules, part 6212.1800 to 6212.2300 and 6134) prohibit the take of threatened or endangered species without a permit. Given the presence of this state-protected bird, **disturbance to suitable nesting habitat must be avoided between mid-May and July, the breeding season for Wilson's phalaropes**.

  Please contact Review.NHIS@state.mn.us **to confirm that the above avoidance measure will be implemented or to inform us that avoidance is not feasible.** If avoidance is not feasible, the project area will need to be surveyed for active nests prior to any project disturbance. Requirements for surveys and lists of DNR certified lists of surveyors can be found at the Natural Heritage Review website.

- The Natural Heritage Information System (NHIS) tracks bat roost trees and hibernacula plus some acoustic data, but this information is not exhaustive. Even if there are no bat records listed nearby, all of Minnesota's bats, including the federally endangered northern long-eared bat (*Myotis septentrionalis*), can be found throughout Minnesota. During the active season (approximately April-November) bats roost underneath bark, in cavities, or in crevices of both live and dead trees. Tree removal can negatively impact bats by destroying roosting habitat, especially during the pup rearing season when females are forming maternity roosting colonies and the pups cannot yet fly. To minimize these impacts, **the DNR recommends that tree removal be avoided from June 1 through August 15.**

- Please visit the DNR Rare Species Guide for more information on the habitat use of these species and recommended measures to avoid or minimize impacts.

Federally Protected Species

- The area of interest overlaps with a U.S Fish and Wildlife Service (USFWS) Rusty Patched Bumble Bee High Potential Zone. The rusty patched bumble bee *(Bombus affinis)* is federally listed as endangered and is likely to be present in suitable habitat within High Potential Zones. From April through October this species uses underground nests in upland grasslands, shrublands, and forest edges, and forages where nectar and pollen are available. From October through April the species overwinters under tree litter in upland forests and woodlands. The rusty patched bumble bee may be impacted by a variety of land management activities including, but not limited to,

prescribed fire, tree-removal, haying, grazing, herbicide use, pesticide use, land-clearing, soil disturbance or compaction, or use of non-native bees. If applicable, **the DNR recommends reseeding disturbed soils with native species of grasses and forbs using** BWSR Seed Mixes **or** MnDOT Seed Mixes**.**

To ensure compliance with federal law, please conduct a federal regulatory review using the U.S. Fish and Wildlife Service's online Information for Planning and Consultation (IPaC) tool. Please note that all projects, regardless of whether there is a federal nexus, are subject to federal take prohibitions. The IPaC review will determine if prohibited take is likely to occur and, if not, will generate an automated letter. The USFWS RPBB guidance provides guidance on avoiding impacts to rusty patched bumble bee and a key for determining if actions are likely to affect the species; the determination key can be found in the appendix.

- To ensure compliance with federal law, conduct a federal regulatory review using the U.S. Fish and Wildlife Service's (USFWS) online Information for Planning and Consultation (IPaC) tool.

Environmental Review and Permitting

- Please include a copy of this letter and the MCE-generated Final Project Report in any state or local license or permit application. Please note that measures to avoid or minimize disturbance to the above rare features may be included as restrictions or conditions in any required permits or licenses.

The Natural Heritage Information System (NHIS), a collection of databases that contains information about Minnesota's rare natural features, is maintained by the Division of Ecological and Water Resources, Department of Natural Resources. The NHIS is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, native plant communities, and other natural features. However, the NHIS is not an exhaustive inventory and thus does not represent all of the occurrences of rare features within the state. Therefore, ecologically significant features for which we have no records may exist within the project area. If additional information becomes available regarding rare features in the vicinity of the project, further review may be necessary.

For environmental review purposes, the results of this Natural Heritage Review are valid for one year; the results are only valid for the project location and project description provided with the request. **If project details change or the project has not occurred within one year, please resubmit the project for review within one year of initiating project activities.**

The Natural Heritage Review does not constitute project approval by the Department of Natural Resources. Instead, it identifies issues regarding known occurrences of rare features and potential impacts to these rare features. Visit the Natural Heritage Review website for additional information regarding this process, survey guidance, and other related information. For information on the

environmental review process or other natural resource concerns, you may contact your DNR Regional Environmental Assessment Ecologist.

Thank you for consulting us on this matter and for your interest in preserving Minnesota's rare natural resources.

Sincerely,

Molly Barrett
Natural Heritage Review Specialist
Molly.Barrett@state.mn.us

Cc: Melissa Collins, Regional Environmental Assessment Ecologist, Central (Region 3)

APPENDIX D: RARE SPECIES SURVEY RESULTS

Critical Connections Ecological Services, Inc.
450 Main Street North, Suite 130, Stillwater, Minnesota 55082

Natural Resource Consulting
Landscape Ecology
Botanical Inventories
Threatened & Endangered Species Surveys
Greenway & Open Space Planning
Natural Community Restoration
Wetland Delineation & Permitting
Wetland Banking & Monitoring
Minnesota Land Cover Classification
Geographic Information Systems
Global Positioning Systems
Database Management & Development
Environmental Education

December 18, 2024

Bridget Henning-Randa
Endangered Species Consultant
Minnesota Department of Natural Resources
500 Lafayette Road, Box 32
St. Paul, MN 55155-4032

RE: Botanical Survey Final Report
Houston Engineering, Inc.
Anoka County Ditch 53-62 Branch 5&6 Repair Project
City of Blaine, Anoka County, Minnesota

Dear Bridget Henning-Randa:

The Rice Creek Watershed District (RCWD) retained the services of Critical Connections Ecological Services (CCES) to complete botanical surveys to determine the presence/absence and distribution of state-listed rare vascular plant species occurring within a 32.3 acre survey area within the Rice Creek Watershed District, Blaine, Anoka County. The survey area includes portions of the alignment of Anoka County Ditch 53-62 Branch 5 and Branch 6 as well as a 50 foot buffer to either side of the ditch center line as defined by the RCWD. These segments of ACD 53-62 are scheduled for improvements and maintenance by the RCWD in 2025. CCES began presence/absence surveys on July 1, 2024, and completed detailed surveys on October 15, 2024. The following report provides background, methods, and results associated with these botanical surveys of the ACD 53-62 project area.

Project Background:

The ACD 53-62 improvements and maintenance project (Project) is located in T31N R23W Sections 15, 22, 23, 26, 27, & 28; in the RCWD, City of Blaine, Anoka County, Minnesota. The Project is generally located to the west of Interstate 35W and south of 109th Avenue NE (County Hwy 12). The project location and associated survey boundaries are shown in **Appendix A, Figure 1**. Botanical surveys were completed within a defined survey area as provided by the RCWD. The survey area included portions of the alignment of Branch 5 and Branch 6 of ACD 53-62 proposed for improvements, as well as a buffer of 50 feet on either side of the ditch centerline.

To prepare for the surveys, CCES reviewed correspondence from the MNDNR to the RCWD dated April 26, 2024 (Project ID: MCE-2024-00235). The letter summarized the results of a

Phone: 651.433.4410 Email: info@ccesinc.com Web: www.ccesinc.com

Natural Heritage Information System (NHIS) review completed by the MNDNR for the Project area. Results of the NHIS query indicated that "a dozen unique state-listed endangered and threatened plant species have been documented in the vicinity of the proposed project. Minnesota's Endangered Species Statute (Minnesota Statutes, section 84.0895) and associated Rules (Minnesota Rules, part 6212.1800 to 6212.2300 and 6134) prohibit the take of endangered or threatened plants or animals, including their parts or seeds, without a permit. A qualified surveyor was required to determine if suitable habitat exists within the Project's proposed impact area, and, if so, complete botanical surveys for state-listed and protected vascular plant species prior to initiation of any project activities.

CCES completed an additional query of the NHIS database (CCES License LA 2023-032, last updated April 2024) to generate a list of specific rare plant species known to occur within one mile of the entire survey boundary. These species and their associated habitats served as the focus and target of field surveys. Rare vascular plant species known to occur (NHIS) within a one mile radius of the survey boundary are listed below in **Table 1**.

Table 1: NHIS Query Results - Species List (Recommended for Survey)

Scientific Name	Common Name	MN Status	Optimal Survey Period
Aristida longespica	Slimspike three-awn	Endangered	August to September
Fimbristylis autumnalis	Autumn fimbry	Special Concern	July to September
Juncus marginatus	Marginated rush	Endangered	August to September
Orobanche uniflora	One-flowered broomrape	Threatened	May to June
Platanthera flava	Tubercled rein orchid	Threatened	June to August
Polygala cruciata	Cross-leaved milkwort	Endangered	July to August
Rubus fulleri	Fuller's bristle-berry	Threatened	July to August
Rubus missouricus	Missouri bristle-berry	Endangered	July to August
Rubus stipulatus	A bristle-berry	Endangered	July to August
Sceptridium rugulosum	St. Lawrence grapefern	Special Concern	Spring to Fall
Trichophorum clintonii	Clinton's bulrush	Threatened	May to June
Viola lanceolata	Lance-leaf violet	Threatened	Spring to Fall
Xyris torta	Twisted yellow-eyed grass	Endangered	July to August

The rare vascular plant species that were surveyed for included those listed above in **Table 1** as well as additional associated rare species which are known to occur in similar habitats in the Anoka Sand Plain (as shown below in **Table 2**).

Prior to the start of botanical survey work, CCES was required to submit a rare species survey proposal to the MNDNR for review and approval. As required, the proposed survey protocol was submitted to the MNDNR on June 26, 2024 via an email to reports.nhis@state.mn.us. This survey protocol is included as **Appendix C** of this report.

Survey Methods:

As proposed in the submitted survey protocol, CCES plant ecologists conducted botanical field surveys within the defined survey area (see **Figure 1**) to detect any Minnesota special concern, threatened, or endangered vascular plant species occurring within the survey area that could be affected by the planned ditch improvement project.

Target Plant Species:

CCES completed surveys for the target plant species that were identified in the NHIS review (**Table 1**), and for additional species, which have been detected in similar habitats within the vicinity of the project in the Anoka Sand Plain. Additional species that were surveyed for are included in **Table 2**, below.

Table 2: Additional Target Plant Species Included in the Survey

Scientific Name	Common Name	MN Status	Optimal Survey Period
Botrychium simplex	Least moonwort	Special Concern	May to June
Decodon verticillatus	Waterwillow	Special Concern	June to July
Gaylussacia baccata	Black huckleberry	Threatened	August to September
Potamogeton bicupulatus	Snailseed pondweed	Endangered	July to August
Rotala ramosior	Toothcup	Threatened	August to September
Rubus multifer	Kinnickinnick dewberry	Special Concern	July to August
Rubus vermontanus	Vermont blackberry	Special Concern	July to August
Rubus wheeleri	Wheeler's blackberry	Watchlist	July to August
Sceptridium oneidense	Blunt-lobed grapefern	Threatened	May to October

Desktop and Existing Data Review:

Prior to the start of any field work, CCES reviewed existing desktop based and written information related to the project site and/or the specific vascular plant species and habitats for which we will be surveying. CCES reviewed habitat requirements for each of the above listed species (**Table 1** and **Table 2**) using the MNDNR's Rare Species Guide as well as other pertinent reference material (i.e. Smith 2008, Trees and Shrubs of Minnesota, Statement of Need and Reasonableness (2012)).

As necessary, CCES visits the University of Minnesota Herbarium prior to conducting any field work to review collections of preserved specimens of the species listed in **Table 1** and **Table 2** to ensure a thorough understanding of identifying field characters.

CCES reviewed existing desktop-based habitat information (i.e. Color and infra-red aerial photographs, land cover, LiDAR, Soils, Wetlands/NWI, NHIS (LA 1034)) to help refine and focus our field search area.

Field Survey Methods:

Initial Surveys:

CCES ecologists conducted initial surveys for the presence/absence of the vascular plant species listed above (**Table 1** and **Table 2**) as well as their associated habitats between July 1 and August 30, 2024. The optimal survey period for most of the plant species listed was included within this survey time frame. Field survey work was led and completed by CCES Principal Ecologist, Jason Husveth (MNDNR Approved Surveyor for Endangered and Threatened Vascular Plant Species). Jason was assisted in the field by additional CCES field staff, including Amy Husveth.

Plant survey work was conducted using a random meander survey protocol. This type of survey allowed for coverage of all habitats and plant community types within the survey boundary, regardless of their condition and suitability to support rare species. When suitable habitat for any of the above listed species was encountered in the field (**Table 1** and **Table 2**), a more focused and intensive survey was completed within the habitat(s). An informed meander survey of suitable habitats was used to detect suitable micro-habitats and plant associations known to support the individual target rare plant species. Biotic and abiotic information was used to successfully detect and locate target rare species.

Detailed Surveys:

Once initial surveys were completed, CCES reported to the RCWD our initial findings in mid-August, 2024. CCES then coordinated with the RCWD to complete follow up detailed surveys of locations with positive rare species detections. Once authorized, CCES completed detailed surveys of two portions of ditch alignments where state-listed species were detected. Detailed surveys were authorized in late August 2024, and field work of detailed surveys was completed between September 1 and October 15, 2024. Detailed surveys focused on locating the spatial extents of all detected rare species subpopulations, flagging these extents in the field, recording of spatial extents with a GPS, counting of individuals, and collection of voucher specimens, photographs and required habitat information.

Documentation of Rare Vascular Plant Species:

When state-listed vascular plant species were detected by CCES ecologists in the field, CCES flagged the extents of rare species subpopulations or individuals and recorded GPS point locations. When detections were large and contained multiple individuals, CCES flagged the perimeter of the detection and counted the number of individual plants (or stems) contained within the area. CCES spatially recorded the boundary of the detection with a sub-meter accuracy Trimble global positioning system (GPS).

Along with location information, CCES also collected more detailed field data associated with each detection and summarized findings using a standard data collection sheet. Data sheets included a description of each detection, a description of the associated habitat, a list of associated species, and the number of individuals/or stems observed.

When appropriate, CCES collected a voucher specimen(s) of each rare vascular plant species encountered within the Project boundary under Jason Husveth's Special Collector's Permit (Permit No. 36050, issued

June 27, 2024). These specimens have been processed and are being submitted to the MNDNR with this final report and following standard procedures. Along with each specimen sheet, one archival specimen label has been provided which includes specific specimen information such as location, collectors/surveyors, dates, habitat, and associated species. These data are also included in Mr. Husveth's rare species reporting database, to be submitted to the MNDNR NHIS on or before January 31, 2025. Where necessary, representative photographs of specimens and habitats were collected (see **Appendix B** of this report).

Survey Results:

During the 2024 surveys of the ACD 53-62 ditch system, CCES detected four state-listed species occurring at two survey sites, comprising a total of five subpopulations. State-listed species were detected along ACD 53-62 Branch 5 and Branch 6 (see **Figures 2, 3A, and 3B, Appendix A**).

Along ACD 53-62 Branch 5, the following state-listed species was detected: *Rubus semisetosus* (MN Threatened; see **Figure 3A**). Along ACD 53-62 Branch 6, the following state-listed species were documented within the survey limits: *Rubus stipulatus* (MN Endangered), *Rubus semisetosus* (MN Threatened), *Platanthera flava* var. *herbiola* (MN Threatened), and *Rubus multifer* (MN Special Concern; see **Figure 3B**).

Tables 3 and 4 below, provide an accounting of each subpopulation detected by species, the spatial extent of each subpopulation as mapped in a GIS, and an estimated count of the number of individual plants located within each subpopulation per the methods described above. No additional rare species locations were detected within the remainder of the survey area.

ACD 53-62 Branch 5 Rare Plant Detections:

On location of rare plant subpopulations were detected along ACD 53-62 Branch 5. These were comprised of one location of *Rubus semisetosus* (Swamp Blackberry, MN Threatened). Detections along Branch 5 are summarized below, and are depicted in **Appendix A, Figures 2, and 3A.**

Table 3. ACD 53-62 Branch 5 Rare Plant Subpopulation Detections, Area, and Estimated Count of Individuals

Subpopulation ID	Scientific Name	Common Name	Subpopulation Area (SQFT)	Subpopulation Estimated Count
RSE-05	*Rubus semisetosus*	Swamp Blackberry	379	62 Canes

RSE-05 Subpopulation Notes: This subpopulation of *Rubus semisetosus* was comprised of 62 canes, located within a relatively small area immediately adjacent to the ditch and on ditch spoil (250 square feet). Of these canes, most were vegetative primocanes, and very few floricanes were observed producing viable fruit (restricted to sunnier areas). This subpopulation was located on the transition between a southern wet aspen forest (WFs55a) and northern wet meadow openings (WMn82b1) immediately adjacent to the ditch. These swamp blackberries were associated with*: Populus tremuloides, Betula papyrifera, Ulmus americana, Prunus serotina, Salix nigra, Salix* spp., *Rhamnus cathartica, Rubus idaeus, Spiraea alba, Solidago gigantea, Carex lacustris, Calamagrostis canadensis,* and *Phalaris arundinacea.* Soils were saturated to seasonally inundated Isanti sandy loams, with a shallow sedge peat organic surface layer. Exposure was partial sun to partial shade. The plants were most densely occurring in the sunnier and more open/exposed portions of the habitat and were stunted in shadier areas among the quaking aspen.

No voucher specimens of *Rubus semisetosus* were collected at the subpopulation location along ACD Branch 5. This was due to the general lack of flowering and fruiting floricanes and the relatively small size of the subpopulation (less than 100 canes, primarily primocanes). However, CCES is certain of the species identification, based on the following combination of field characters: an upright bristle-berry, with palmately compound leaves, aciculate prickles too weak to break skin, prickles weak and less than 4mm in length, and the undersides of primocane leaflets were moderately to densely hairy. The few withered floricane inflorescences that were found in the field contained flowers with glandular hairs on the pedicles.

ACD 53-62 Branch 6 Detections:

Four locations of rare plant subpopulations were detected along ACD 53-62 Branch 6. These were comprised of one location of *Rubus stipulatus* (A Species of Bristle-berry, MN Endangered), *Rubus semisetosus* (Swamp Blackberry, MN Threatened), one location of *Platanthera flava* var. *herbiola* (Tubercled Rein-orchid, MN Threatened), and one location of *Rubus multifer* (Kinnickinnick Dewberry, MN Special Concern). Detections along ACD 53-62 Branch 6 are summarized below, and are depicted in **Appendix A, Figures 2, and 3B.**

Table 4 summarizes these detections associated with the southern end of Branch 6 of Anoka County Ditch 53-62. These four species were generally occurring in the same wet meadow (WMn82a/b1) and wet forest (WFs55a) habitat near the southern end (headwaters) of Branch 6.

Table 4. Branch 6 Rare Species Subpopulation Detections, Area, and Count of Individuals

Subpopulation ID	Scientific Name	Common Name	Subpopulation Area (SQFT)	Subpopulation Estimated Count
RST-06	*Rubus stipulatus*	A Species of Bristle-berry	371	16 Canes
RSE-06	*Rubus semisetosus*	Swamp Blackberry	4,062	508 Canes
PF-06	*Platanthera flava*	Tubercled Rein-orchid	594	74 Plants
RMU-06	*Rubus multifer*	Kinnickinnick Dewberry	67	3 Canes

Voucher specimens for RMU-06 (JJH-2024-144), RSE-06 (JJH-2024-118, 119, 120A/120B), and PF-06 (JJH-2024-114, 115) were collected at the Branch 6 locations. No voucher specimens were collected for RST-06 (*Rubus stipulatus*) because there were too few individuals and these were primarily primocane material, with diagnostic large stipules relatively absent from damping off in high humidity conditions. Photographs of *Rubus stipulatus* primocanes and leaves were collected.

RST-06 Subpopulation Notes: This subpopulation of *Rubus stipulatus* was comprised of 16 canes, located within a relatively small area (371 square feet). Of these canes, most were vegetative primocanes, and no floricanes were observed producing viable fruit. This subpopulation was located on the transition between a southern wet aspen forest (WFs55a) and northern wet meadow openings (WMn82b1). These Minnesota Endangered bristle-berries were closely associated and co-occurring with *Rubus semisetosus* (MN Threatened), *Rubus idaeus,* and *Rubus multifer* (MN Special Concern). Other associated species included: *Populus tremuloides, Betula papyrifera, Ulmus americana, Prunus serotina, Salix nigra, Salix* spp., *Rhamnus cathartica, Spiraea alba, Solidago gigantea, Carex lacustris, Calamagrostis canadensis,* and *Phalaris arundinacea.* Soils were earthworm impacted saturated to mesic Isanti sandy loams, with a shallow sedge peat organic surface layer. Exposure was partial shade to shade.

RSE-06 Subpopulation Notes: This subpopulation of *Rubus semisetosus* was comprised of 508 canes, located within a relatively small area (4,062 square feet). Of these canes, most were vegetative primocanes, and very few floricanes were observed producing viable fruit (floricanes were restricted to sunnier, open areas). This subpopulation was located on the transition between a southern wet aspen forest (WFs55a) and northern wet meadow openings (WMn82b1). These Minnesota Threatened bristle-berries were closely associated and co-occurring with *Rubus stipulatus* (MN Endangered), *Rubus idaeus, Rubus ferrofluvius,* and *Rubus multifer* (MN Special Concern). Other associated species included: *Populus tremuloides, Betula papyrifera, Ulmus americana, Acer rubrum, Acer saccharinum, Prunus serotina, Salix nigra, Salix* spp., *Rhamnus cathartica, Spiraea alba, Solidago gigantea, Lycopus americanus, Euthamia gymnospermoides, Carex lacustris, Calamagrostis canadensis,* and *Phalaris arundinacea.* Soils were earthworm impacted saturated to mesic Isanti sandy loams, with a shallow sedge peat organic surface layer. Exposure was partial shade to shade. Plants were absent from areas of thick reed canary grass or dense shade.

PF-06 Subpopulation Notes: This subpopulation of *Platanthera flava* was comprised of 74 plants, with three plants in flower/fruit at the time of detection on July 29, 2024. This subpopulation of *Platanthera flava* was located within a relatively small area (594 square feet). Of these plants, most were vegetative basal leaves only, with just three individuals producing flower spikes and fruits along open wet meadow microhabitats and deer paths. This subpopulation was located on the transition between a southern wet aspen forest (WFs55a) and northern wet meadow openings (WMn82b1). These Minnesota threatened orchids were associated with typical wet forest and wet meadow species of the Anoka Sand Plain, including: *Populus tremuloides, Betula papyrifera, Ulmus americana, Acer saccharinum, Prunus serotina, Ilex verticillata, Salix nigra, Salix* spp., *Rubus idaeus, Rubus pubescens, Rhamnus cathartica, Spiraea alba, Solidago gigantea, Boehmeria cylindrica, Scutellaria lateriflora, Eutrochium maculatum, Eupatorium perfoliatium, Onoclea sensibilis, Thelypteris palustris, Persicaria saggitata, Carex lacustris, Calamagrostis canadensis,* and *Phalaris arundinacea.* There is a portion of the *Rubus semisetosus* (MN Threatened) subpopulation nearby, sixty feet to the east of these orchids on the east side of the ditch lateral. Soils were earthworm impacted saturated to seasonally inundated Isanti sandy loams, with a shallow sedge peat organic surface layer.

RMU-06 Subpopulation Notes: This small subpopulation of *Rubus multifer* was comprised of three (3) canes, located within a relatively small area (67 square feet). Of these canes, two were prostrate vegetative primocanes, and one was a fruiting floricane. This subpopulation was located as two separate individuals along the upper topographic positions of the transition between a southern wet aspen forest (WFs55a) and northern wet meadow openings (WMn82b1). These Minnesota Special Concern dewberries were closely associated and co-occurring with *Rubus stipulatus* (MN Endangered), *Rubus semisetosus* (MN Threatened)*, Rubus ferrofluvius,* and *Rubus idaeus. Populus tremuloides, Betula papyrifera, Ulmus americana, Acer rubrum, Acer saccharinum, Prunus serotina, Salix nigra, Salix* spp., *Rhamnus cathartica, Spiraea alba, Solidago gigantea, Lycopus americanus, Euthamia gymnospermoides, Carex lacustris, Calamagrostis canadensis,* and *Phalaris arundinacea.* Soils were earthworm impacted mesic to dry Isanti sandy loams, with a shallow sedge peat organic surface layer. Exposure was partial shade to sun, with flowering and fruit production occurring in sub exposed portions of the habitat.

No other state-listed vascular plant species or subpopulations were detected in the remaining 32.3 acre survey areas along the Anoka County Ditch 53-62 Branch 5 and 6.

Other Noteworthy Detections:

As a result of the 2024 surveys, three locations of a non-listed but rarely documented dewberry, *Rubus ithicanus,* were detected and collected. *Rubus ithicanus* is a species of dewberry that is native to Minnesota but has only two prior detections and collections throughout the state (Bell Museum Biodiversity Atlas, accessed December 2024, Smith 2008, Welby Smith email communication July 2024). CCES encountered *Rubus ithicanus* at three locations during the completion of this survey. CCES collected multiple voucher specimens of *Rubus ithicanus* primocanes and floricanes, and these specimens are being submitted along with state-listed species voucher specimens associated with this survey report (specimen sheets JJH-2024-106, 107, 108, 109, 100, and 234, 235).

Berberis thunbergii is an exotic and invasive woody species. Multiple naturalized fruiting individuals were detected among subpopulations RST-06, RSE-06, PF-06, and RMU-06 within wetland edge and upland habitats along Branch 6 of ACD 53-62. In the twenty five years we have been surveying the landscapes of Anoka County, this is the first time we have detected *Berberis thunbergii* as a naturalizing species. Voucher specimens were collected (specimen sheets JJH-2024-113A and 113B). This invasive species location was documented by Jason Husveth through the eddmaps.org website with photo documentation and mapping on July 30, 2024 (Record ID: 12105116, verified by Laura Van Ripper).

Deliverables to the MNDNR:

CCES has prepared this final survey report that includes an introduction, background, methods, and results of the survey effort. In addition to this final survey report, as permitted by MNDNR, CCES has collected and prepared voucher specimens with archival labels to be submitted to Welby Smith, MNDNR State Botanist, at the time of the issuance of the final survey report. Where collections were not permitted or possible, diagnostic digital macrophotography were collected in place of voucher specimens where possible (see **Appendix B**). Lastly, CCES will provide accompanying rare species GIS point and polygon shapefiles and attribute database to Lisa Joyal (MNDNR Endangered Species Environmental Review Coordinator) upon issuance of this final survey report.

Thank you for your review of this botanical survey final report for a planned Anoka County Ditch 53-62 improvement project located in T31N R23W Sections 15, 22, 23, 26, 27, & 28; in the City of Blaine, Anoka County, Minnesota.

Please review this final survey report and supporting information and voucher specimens. Please contact Jason Husveth if you have any questions or require additional information regarding our survey and findings. As of the writing of this report, we believe that botanical surveys of the 32.3 acre ACD 53-62 project area are now complete, and no additional surveys should be necessary.

Respectfully submitted,

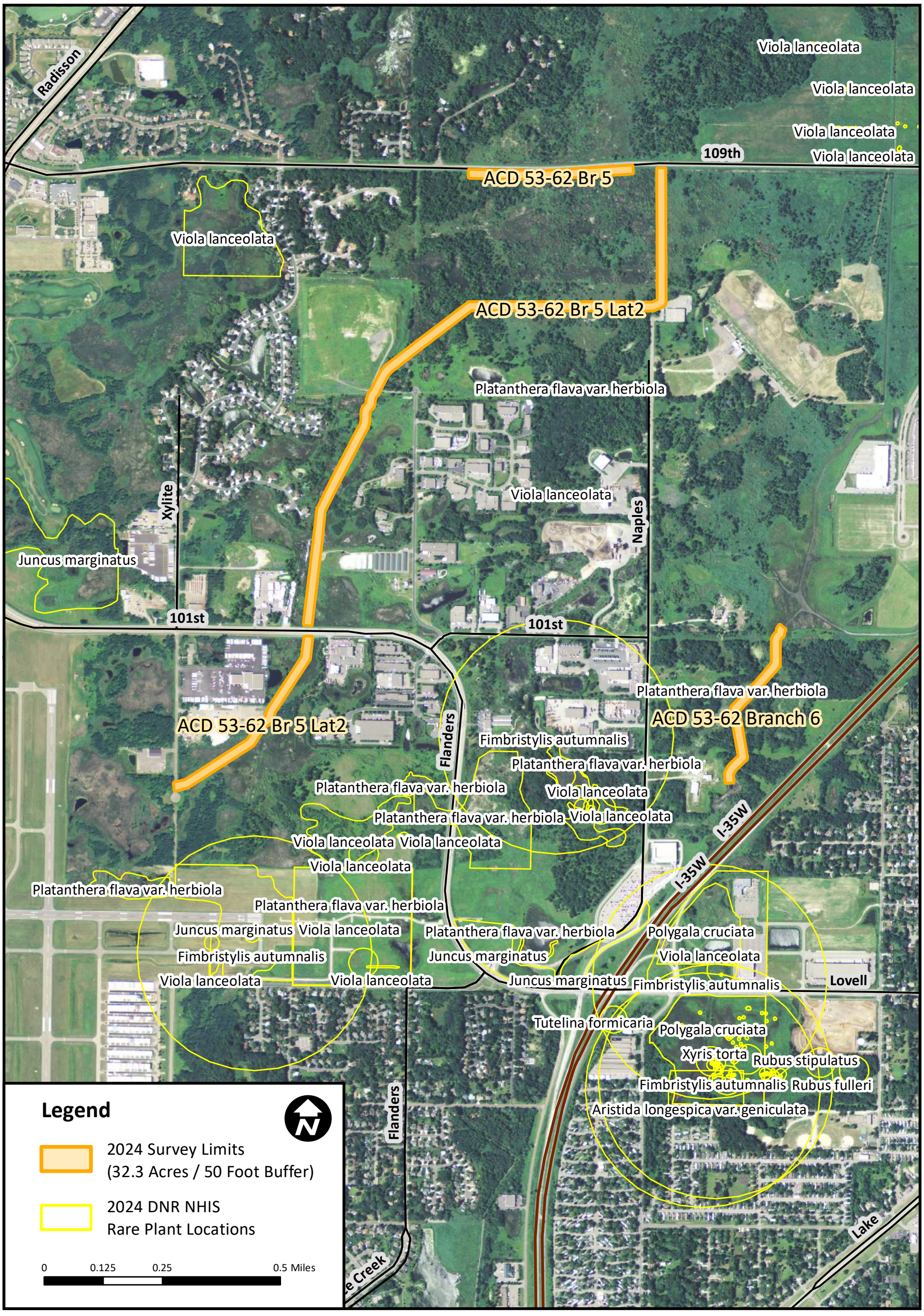
Critical Connections Ecological Services, Inc.

Jason J. Husveth, MS
Principal Ecologist
jhusveth@ccesinc.com | 651-247-0474 cell

cc: Chris Otterness, PE, Senior Civil Engineer, Houston Engineering, Inc.
Nick Tomczik, Administrator, Rice Creek Watershed District
Melissa Collins, MNDNR Regional Environmental Assessment Ecologist

Appendix A

Figures

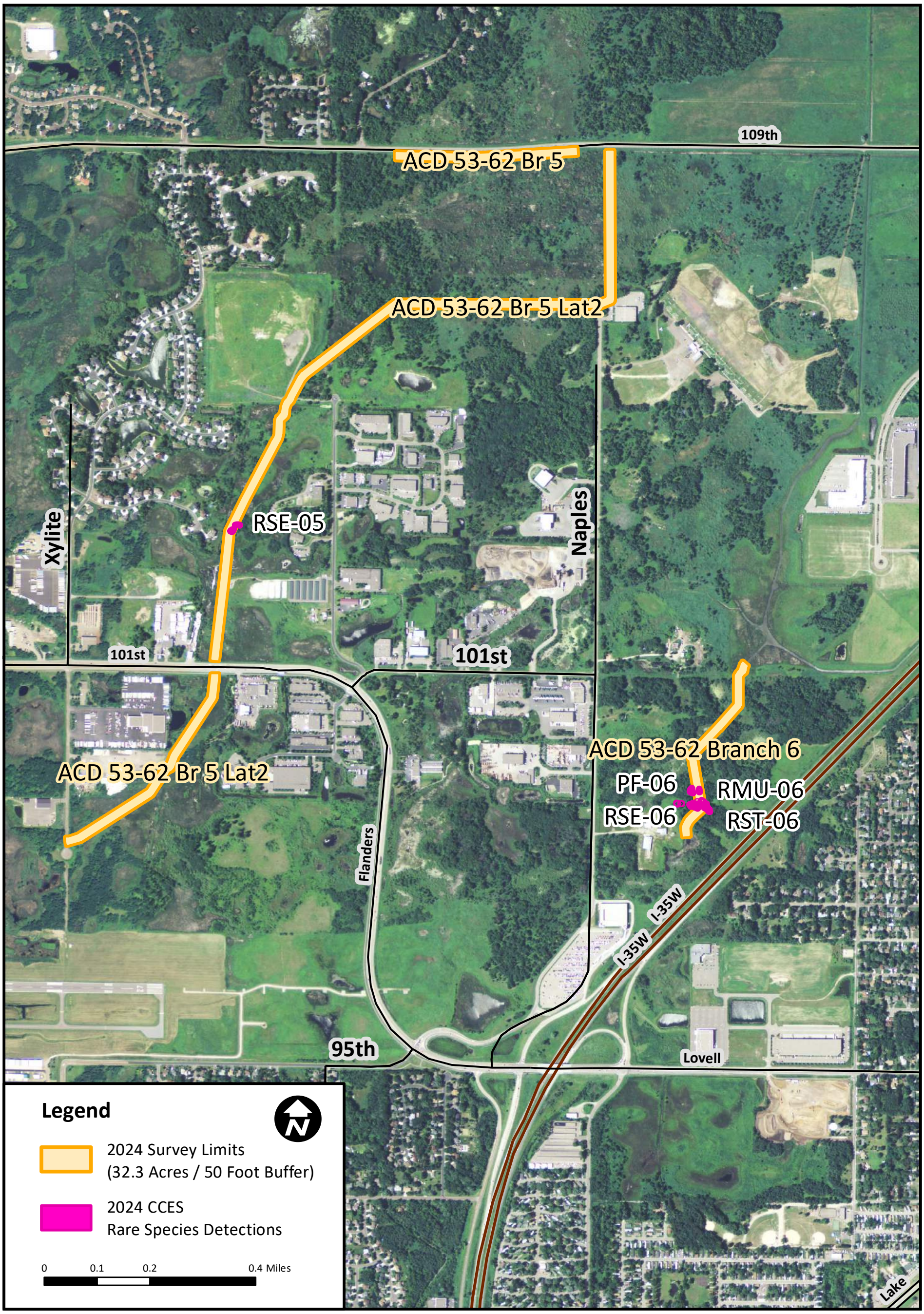


December 18, 2024

Anoka County Ditch 53-62, Branch 5 and 6
Rare Plant Surveys
2024 Survey Areas and NHIS Rare Species Records
Rice Creek Watershed District, Blaine, Anoka County, MN

Critical Connections
Ecological Services, Inc.

Figure 1



December 18, 2024

Anoka County Ditch 53-62, Branch 5 and 6
Rare Plant Surveys
2024 CCES Rare Plant Detections (Overview)
Rice Creek Watershed District, Blaine, Anoka County, MN

Critical Connections
Ecological Services, Inc.

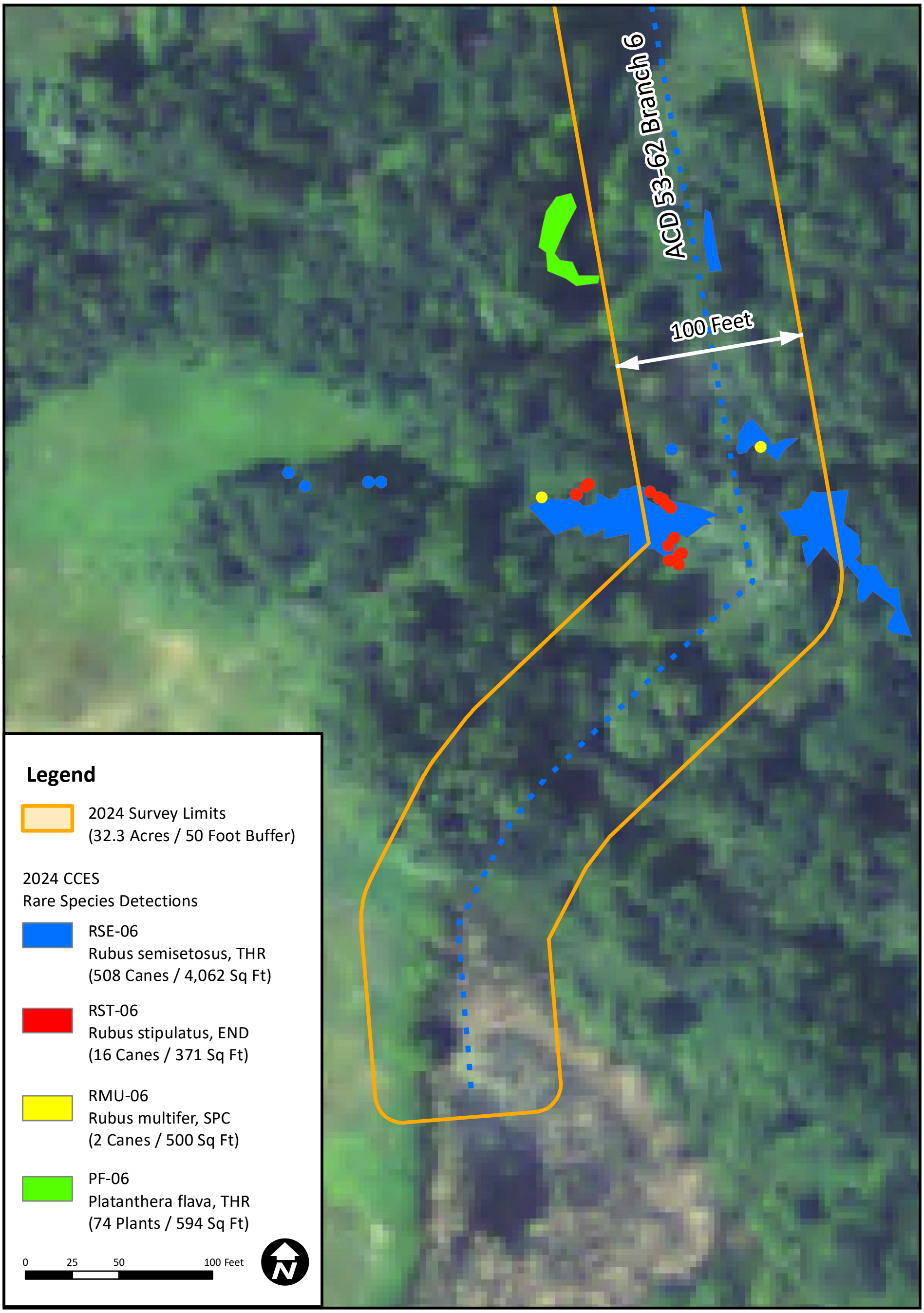
Figure 2

Critical Connections
Ecological Services, Inc.

Anoka County Ditch 53-62, Branch 5
Rare Plant Surveys
2024 CCES Rare Plant Detections (Detail)
Rice Creek Watershed District, Blaine, Anoka County, MN

December 18, 2024

Figure 3A



Critical Connections Ecological Services, Inc.

Anoka County Ditch 53-62, Branch 6
Rare Plant Surveys
2024 CCES Rare Plant Detections (Detail)
Rice Creek Watershed District, Blaine, Anoka County, MN

December 18, 2024

Figure 3B

Appendix B

Photographs

Rubus semisetosus subpopulation RSE-05 along the eastern edge of ACD 53-62 Branch 5

Rubus semisetosus subpopulation RSE-05, primocane leaf and leaf hairs detail

Rubus stipulatus and *R. semisetosus* habitat at southern end of ACD 53-62 Branch 6

Rubus stipulatus subpopulation RST-06 leaf and diagnostic stipules

Platanthera flava subpopulation PF-06, cluster of basal leaf plants at ACD 53-62 Branch 6

Platanthera flava subpopulation PF-06 voucher specimens of flowering orchids

Rubus semisetosus subpopulation RSE-05 along the eastern edge of ACD 53-62 Branch 6

Rubus semisetosus subpopulation RSE-05, primocane leaf, aciculate prickles, and leaf hairs detail

Appendix C

Survey Protocol

(June 26, 2024)

Critical Connections Ecological Services, Inc.
450 Main Street North, Suite 130, Stillwater, Minnesota 55082

Natural Resource Consulting
Landscape Ecology
Botanical Inventories
Threatened & Endangered Species Surveys
Greenway & Open Space Planning
Natural Community Restoration
Wetland Delineation & Permitting
Wetland Banking & Monitoring
Minnesota Land Cover Classification
Geographic Information Systems
Global Positioning Systems
Database Management & Development
Environmental Education

June 26, 2024

Ms. Lisa Joyal
Endangered Species Review Coordinator
Minnesota Department of Natural Resources
500 Lafayette Road, Box 32
St. Paul, MN 55155-4032

RE: Botanical Survey Protocol
Houston Engineering, Inc.
Anoka County Ditch 53-62 Branch 5&6 Repair
City of Blaine, Anoka County, Minnesota

Dear Lisa Joyal:

Houston Engineering, Inc. (Client) has retained the services of Critical Connections Ecological Services (CCES) to complete botanical surveys to determine the presence/absence and distribution of state-listed rare vascular plant species occurring within a 22.5 acre survey area. The survey area includes portions of the alignment of Anoka County Ditch 53-62 Branch 5 and Branch 6 as well as a buffer to the ditch alignment as defined by the Client. This portion of ACD 53-62 is scheduled for improvements and maintenance by the Rice Creek Watershed District (RCWD). The survey area associated with this proposed Project is shown as attached in **Figure 1**.

The ACD 53-62 improvements and maintenance project (Project) is located in T31N R23W Sections 15, 22, 23, 26, 27, & 28; in the RCWD, City of Blaine, Anoka County, Minnesota. The Project is generally located to the west of Interstate 35 and south of 109th Avenue NE (County Hwy 12). The project location and associated survey boundaries are shown in **Figure 1**. Botanical surveys will be completed within a defined survey area as provided by the Client. The survey area includes portions of the alignment of Branch 5 and Branch 6 of ACD 53-62 as well as a buffer of 50 feet on either side of the ditch centerline. CCES will begin presence/absence surveys beginning on Monday, July 1, 2024.

CCES reviewed correspondence from the MNDNR to the Client dated April 26, 2024 (Project ID: MCE-2024-00235). The letter summarized the results of a Natural Heritage Information System (NHIS) review completed by the MNDNR for the Project area. Results of the NHIS query indicated that "a dozen unique state-listed endangered and threatened plant species have been documented in the vicinity of the proposed project. Minnesota's Endangered Species Statute (Minnesota Statutes, section 84.0895) and associated Rules

(Minnesota Rules, part 6212.1800 to 6212.2300 and 6134) prohibit the take of endangered or threatened plants or animals, including their parts or seeds, without a permit. To demonstrate avoidance, a qualified surveyor will need to determine if suitable habitat exists within the activity impact area and, if so, conduct a survey prior to any project activities.

CCES then completed an additional query of the NHIS database (LA 2023-032) to generate a list of specific species known to occur within 1-mile of the survey boundary. These species and their associated habitats will serve as the focus and target of field surveys. Rare vascular plant species known to occur (NHIS) within a one mile radius of the survey boundary are listed below in **Table 1**.

Table 1: NHIS Query Results - Species List

Scientific Name	Common Name	Status	Optimal Survey Period
Aristida longespica	Slimspike three-awn	Endangered	August to September
Fimbristylis autumnalis	Autumn fimbry	Special Concern	July to September
Juncus marginatus	Marginated rush	Endangered	August to September
Orobanche uniflora	One-flowered broomrape	Threatened	May to June
Platanthera flava	Tubercled rein orchid	Threatened	June to August
Polygala cruciata	Cross-leaved milkwort	Endangered	July to August
Rubus fulleri	Fuller's bristle-berry	Threatened	July to August
Rubus missouricus	Missouri bristle-berry	Endangered	July to August
Rubus stipulatus	A bristle-berry	Endangered	July to August
Sceptridium rugulosum	St. Lawrence grapefern	Special Concern	Spring to Fall
Trichophorum clintonii	Clinton's bulrush	Threatened	May to June
Viola lanceolata	Lance-leaf violet	Threatened	Spring to Fall
Xyris torta	Twisted yellow-eyed grass	Endangered	July to August

Due to the presence of multiple state listed species as well as written correspondence and guidance from the MNDNR, a qualified surveyor must complete a habitat assessment and botanical survey within the survey boundary. Rare vascular plant species to be surveyed for include those listed above in **Table 1** as well as additional species as shown below in **Table 2** which are known to occur in similar habitats in the Anoka Sand Plain.

Prior to the start of botanical survey work, CCES is required to submit a rare species survey proposal to the MNDNR for review and approval. To meet this requirement, CCES has prepared the following information:

Proposed Survey Methods:

CCES plant ecologists will conduct field surveys within the defined survey area (see **Figure 1**) to detect any Minnesota special concern, threatened, or endangered vascular plant species occurring within the survey area that could be affected by the planned Project.

In addition to the species to be surveyed for as indicated by NHIS review, CCES will also assess all habitat within the survey area and document any locations of habitat that could be associated with additional rare species that are known to occur in the Anoka Sand Plain in similar habitats as those occurring within the survey boundary.

Target Plant Species:

CCES will complete surveys for the target plant species listed above in **Table 1.**

In addition, CCES will also conduct surveys for additional species, which have been detected in similar habitats within the vicinity of the project in the Anoka Sand Plain. These species are listed below in **Table 2**. Species in **Table 2** are listed as Endangered, Threatened, Special Concern, or Watchlist.

Table 2: Additional Target Plant Species To Be Included in Survey

Scientific Name	Common Name	Status	Optimal Survey Period
Botrychium simplex	Least moonwort	Special Concern	May to June
Decodon verticillatus	Waterwillow	Special Concern	June to July
Gaylussacia baccata	Black huckleberry	Threatened	August to September
Potamogeton bicupulatus	Snailseed pondweed	Endangered	July to August
Rotala ramosior	Toothcup	Threatened	August to September
Rubus multifer	Kinnickinnick dewberry	Special Concern	July to August
Rubus vermontanus	Vermont blackberry	Special Concern	July to August
Rubus wheeleri	Wheeler's blackberry	Watchlist	July to August
Sceptridium oneidense	Blunt-lobed grapefern	Threatened	May to October

The vascular plant species listed above in **Table 1** and **Table 2** as well as their associated habitats will be the focus of the upcoming initial survey effort. Should habitat with the potential to support additional rare vascular plant species not included in the tables above be detected, CCES will make note of such detections in the final report and make recommendations to the Client regarding future survey needs.

Desktop and Existing Data Review:

Prior to the start of any field work, CCES will review existing desktop based and written information related to the project site and/or the specific vascular plant species and habitats for which we will be surveying. CCES will review habitat requirements for each of the above listed species (**Table 1** and **Table 2**) using the MNDNR's Rare Species Guide as well as other pertinent reference material (i.e. Smith 2008, Trees and Shrubs of Minnesota, Statement of Need and Reasonableness (2012)).

If necessary, CCES will visit the University of Minnesota Herbarium prior to conducting any field work to review collections of preserved specimens of the species listed in **Table 1** and **Table 2** to ensure a thorough understanding of identifying field characters.

CCES will also review existing desktop-based habitat information (i.e. Color and infra-red aerial photographs, land cover, LiDAR, Soils, Wetlands/NWI, NHIS (LA 1034)) to help refine and focus our field search area.

Field Survey Methods:

CCES ecologists will conduct surveys for the presence/absence of the vascular plant species listed above (Table 1 and Table 2) as well as their associated habitat between July 1 and August 30, 2024. The optimal survey period for most of the plant species listed does include this planned survey time frame and CCES has experience detecting each of the above listed species during this time period. Should habitat be encountered for any rare vascular plant species that cannot be readily identified or detected during the proposed survey period, CCES will note habitat detections and make a recommendation in the survey report that additional field survey work be considered by the Client.

Field survey work will be lead and completed by CCES lead/principal ecologist, Jason Husveth (MNDNR Approved Surveyor for Endangered and Threatened Vascular Plant Species). Jason may be assisted in the field by additional CCES field staff.

Plant survey work will be conducted using a random meander survey protocol. This type of survey allows for coverage of all plant community types within the survey boundary. When suitable habitat for any of the above listed species is encountered in the field (**Table 1** and **Table 2**), a more focused and intensive survey will be completed in the area. An informed meander survey of suitable habitats will be used to detect suitable micro-habitats and plant associations known to support the individual target rare plant species. Biotic and abiotic information will be used to successfully detect and locate target rare species.

Documentation of Rare Vascular Plant Species:

Should state-listed vascular plant species be detected by CCES ecologists in the field, CCES will flag and record a GPS point location(s) of individual rare vascular plant(s) or populations. If detections are large and contain multiple individuals, CCES will flag the perimeter of the detection and count the number of individual plants contained within the area. CCES will then GPS the boundary of the detection.
Along with location information, CCES will also collect detailed field data associated with each detection and summarize findings using a standard data collection sheet. Data sheets will include a description of each detection, a description of the associated habitat, a list of associated species, and the number of individuals/or stems observed.

CCES will collect one voucher specimen of each rare vascular plant species encountered within the Project boundary under Jason Husveth's Special Collector's Permit (permit renewal pending approval

with Bridget Henning-Randa, renewal application submitted June 18, 2024). The specimen(s) will be prepared and submitted to the MNDNR following standard procedures. Along with each specimen, one archival specimen label will be provided which shall include specific specimen information such as location, collectors/surveyors, habitat, and associated species.

Deliverables to the MNDNR:

CCES will prepare a final survey report that will include an introduction, background, methods, and results section to summarize the survey effort. The final survey report will be issued to the MNDNR at the completion of the survey. In addition to the final survey report, as permitted by MNDNR, CCES will provide voucher specimens with archival labels to Welby Smith, MNDNR State Botanist, at the time of the issuance of the final survey report. If collections are not permitted or possible, diagnostic digital macrophotography will be submitted in place of voucher specimens. Lastly, CCES will provide a completed rare species GIS point and/or polygon shape file and attribute database to Lisa Joyal (MNDNR Endangered Species Environmental Review Coordinator) and Derek Anderson (Botanist/Plant Ecologist) upon completion of the surveys and issuance of the final survey report.

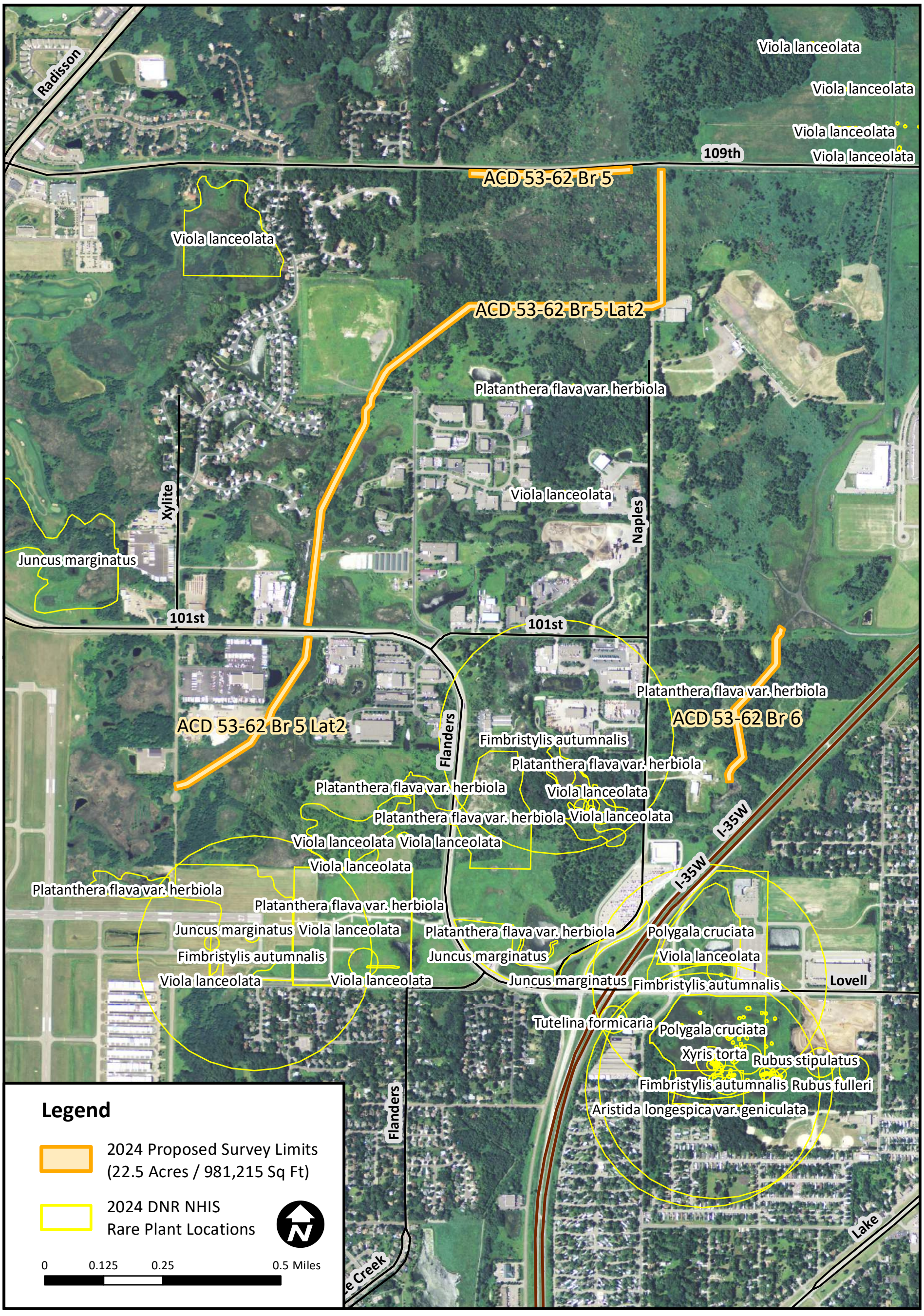
Thank you for your review of our rare species survey proposal (provided by CCES on behalf of Houston Engineering, Inc. for a planned project located in T31N R23W Sections 15, 22, 23, 26, 27, & 28; in the City of Blaine, Anoka County, Minnesota. Please review the proposed survey methods and contact us if you have any questions or suggestions to improve upon our suggested survey methodology. CCES plans to begin survey work as soon as possible in July 2024.

Respectfully submitted,

Critical Connections Ecological Services, Inc.

Jason J. Husveth, MS
Principal Ecologist
651-247-0474
jhusveth@ccesinc.com

cc: Chris Otterness, PE, Senior Civil Engineer, Houston Engineering, Inc.



June 26, 2024

Initial Rare Plant Surveys and Potential Habitat Assessment
Anoka County Ditch 53-62, Branch 5 and 6
2024 Proposed Survey Area and NHIS Rare Species Detections
Rice Creek Watershed District, Blaine, Anoka County, MN

Critical Connections
Ecological Services, Inc.

Figure 1