MINNEHAHA CREEK
WATERSHED DISTRICT
QUALITY OF WATER, QUALITY OF LIFE

Meeting: Board of Managers
Meeting date: 2/27/2025
Agenda Item #: 9.1
Item type: Permit

Title: 24-401: Burl Oaks Golf Course Redesign

Prepared by: Name: Maggie Menden
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Recommendation:
Approval of the Minnehaha Creek Watershed District (MCWD) permit on the following conditions:

- Submittal of 100% design and modeling package
- Payment of MCWD fees for cost of permit application, public notice mailing, and engineering review
- Financial Assurance for Stormwater Management ($4,766.67) and Wetland Protection ($10,440)
- Declaration for maintenance of stormwater, waterbody crossings, wetland restoration, and buffer areas
- Provide final planting plans for wetland buffers and wetland restoration area for MCWD staff approval
- Submittal of annual reports of management inputs into the course, including fertilizer, irrigation and pesticide

Project Location and Scope

Location and Hydrology:

Burl Oaks Golf Course (BOGC or Applicant) is a 198.82 acre, privately owned 18-hole golf course located at 5400 North Arm Drive in the City of Minnetrista. The course is located within the Painter Creek subwatershed, which ultimately discharges to impaired Jennings Bay on Lake Minnetonka. Within the course, there are 13 wetlands, all of which are naturally occurring, that range from Manage 1 to Manage 3 classifications based on MCWD's Functional Assessment of Wetlands (FAW). All of these have been altered over time through excavation to serve as open water hazards and aesthetic features within the golf course. 92.3% of the site drains through these existing water features north towards the central large open water wetlands, into Wetland 23 to the northwest, under County Road 110 and then into Painter Marsh and Painter Creek, before traveling south under County Road 26, ultimately into impaired Jennings Bay on Lake Minnetonka. A small area representing 7.7% of the site, including the clubhouse, drains south under North Arm Drive into a series of wetlands, before traveling east under County Road 19 and into Forest Lake on Lake Minnetonka.

Project Purpose and Scope:

Burl Oaks Golf Course has strategically evaluated its future, considering the option of selling the course for housing, and has determined to reinvest in the course to reposition play to be more accessible to a broader demographic of players. The proposed project involves significant grading to modify the course layout, the replacement of aging drainage infrastructure comprising culverts under bituminous cart paths and stormsewer, and the removal and reconstruction of bituminous cart paths. Reconstruction of the course's cart paths is proposed to reduce existing impervious surface by 1.95 acres, from 5.43 existing acres to 3.48 acres. Drainage patterns and routing will remain almost identical.

Regulatory Framework and Triggers:

The applicant's proposed work triggers MCWD's regulations for Erosion Control, Floodplain Alteration, Waterbody Crossings and Structures, Stormwater Management, and Wetland Protection. The site's wetlands are also regulated pursuant to the Minnesota Wetland Conservation Act (WCA), MN Rules 8420, implemented by the City of Minnetrista as the Local Government Unit.

The Erosion Control Rule is triggered due to land disturbance area greater than 5,000 square feet. The Floodplain Alteration Rule is triggered due to grading within the 100-Year floodplain of wetlands on site. The Waterbody Crossings and Structures Rule is triggered based on the reconstruction of storm sewer infrastructure that contacts the bed and banks of wetlands on site. The Wetland Protection Rule is triggered, requiring buffers downgradient of impervious surface associated with cart paths and around wetlands where new storm sewer infrastructure is being placed. The

Stormwater Management Rule is triggered due to the construction of over one acre of impervious surface. The City of Minnetrista, as WCA LGU, and the United States Army Corps of Engineers have authorized 0.73 acres of wetland impact, associated with the proposed grading, to be replaced through offsite wetland banks.

Proposed Exception:

The applicant is proposing to meet the Wetland Protection Rule via an Exception. The applicant proposes to omit required wetland buffers (2.87 acres), in locations downgradient of cart paths and in locations where new storm sewer is to be placed within wetland edges, on the ground that they would interfere with golf play. Instead, the applicant is proposing an Exception, an alternative approach that would achieve or improve water resource outcomes of the type the Board intends with its wetland buffer standards, including:

- A 3.93-acre wetland restoration, which removes historic wetland fill
- 1.51 acres of wetland buffers in locations not required, where they do not interfere with play

Other elements of the applicant's proposal, intended to contribute additional water resource benefit, include:

- A 1.95-acre reduction in site hardcover from 5.43 to 3.48 acres
- 2.26 acres of low maintenance fescue in areas where wetland buffers are required
- 3,266 cubic yards, or 2 acre-feet, of additional 100-year floodplain storage
- New irrigation system estimated to reduce water consumption by 4.7M to 6.3M gallons per year (30-40%)
- Improved grass varieties estimated to reduce pesticide use by 40%, from 8-10 applications/year to 3-6
- Reduced fertilizer inputs by an estimated 20%. Burl Oaks is phosphorus free course

MCWD Rule Analysis:

Erosion & Sediment Control

MCWD's Erosion Control Rule applies to projects disturbing more than 5,000 square feet of ground surface. The project proposes to disturb 75-acres; therefore, the rule applies. The Applicant proposes redundant perimeter controls around all wetlands, rock construction entrances, and inlet protection. These Best Management Practices (BMPs) can be found in Attachment A.

Staff and the District Engineer have reviewed the proposed plans and have found them to be complete and compliant with all Erosion Control Rule requirements.

Floodplain Alteration

MCWD's Floodplain Alteration Rule is triggered when a project proposes to fill, excavate, or grade within the floodplain of a waterbody. MCWD defines a waterbody as a waterbasin, watercourse, or wetland. Therefore, any proposed fill within the floodplain of an on-site wetland must be offset so there is no loss in flood storage between the ordinary high water and 100-year high water elevation of the wetland. The Applicant has modeled the ordinary high-water level (OHW) and 100-year elevation for each wetland and has submitted cut-fill calculations based on the proposed grading. The Project meets floodplain requirements for each basin by offsetting all proposed fill with an equal or greater volume of compensatory storage. The design provides an additional 3,266 cubic yards of flood storage amongst 10 basins throughout the site. Cut and fill calculations for each individual wetland are shown in Attachment B.

Staff and the District Engineer have reviewed the permit application and have found it to be complete and compliant with all Floodplain Alteration Rule requirements.

Waterbody Crossings & Structures

MCWD's Waterbody Crossings and Structures Rule is triggered when a structure comes in contact with the bed or bank of a waterbody. Numerous structures associated with storm sewer inlets and outfalls trigger this rule. This Rule requires that each pipe meet the criterion of meeting a demonstrated specific need, retaining adequate hydraulic capacity, preserving navigational capacity, preserving aquatic and wildlife passage, being designed to reduce erosion and scour, and being the minimal impact solution. Each crossing has been designed to address each MCWD criterion. Details for each crossing can be found in Attachment C.

Staff and the District Engineer have reviewed the permit application and have found it to be complete and compliant with all Waterbody Crossings & Structures Rule requirements, subject to maintenance declaration.

Stormwater Management

MCWD's Stormwater Management Rule applies to development that meets criteria for site size, extent of site disturbance, and impervious surface as outlined in Table 1 in the rule. The Project is subject to Section 2(a) of the Stormwater Management rule, due to the proposed development on a site that is greater than one acre and proposes greater than one acre of new and fully reconstructed impervious area, less than 40% site disturbance, and less than 50% increase in impervious surface. Therefore, the Project is required to provide volume management for stormwater runoff from all new and reconstructed impervious surface, and to provide for rate control.

The Project proposes to reduce the site's impervious surface from 5.43 to 3.48 acres, associated with a reduction in total length and footprint of cart paths. The proposed reconstruction of 1.43 acres of cart path will require 10,382 cubic feet of volume treatment. Per 3(b)(5), due to the presence of Hydrologic Soil Group C and D soils, which have low infiltration rates and are unreliable for infiltration, the Applicant has proposed filtration of stormwater in a manner consistent with MCWD Rule. Due to the diffuse routing of runoff from the cart path, the applicant is proposing to treat runoff from the club house and parking lot area, which is presently untreated and discharges a higher pollutant load than the cart path. Given the reductions in hardcover elsewhere on the site, this configuration is expected to provide the greatest site load reduction while not increasing local loading within the northern portion of the site.

The majority of the site discharges northwest to Painter Creek. The remainder of the site discharges south at two points along North Arm Drive. The Applicant has provided H&H Modeling to demonstrate no increase in peak runoff rates from the site, in aggregate, for the 2-year, 10-year, and 100-year storm events. There is no proposed increase in peak runoff rates at the northwest discharge point and no proposed increase in peak runoff rates at the southern discharge points.

The Applicant has demonstrated that two feet of vertical separation is provided between the proposed filtration basins, and on-site wetlands, and the on-site structures, including the clubhouse and maintenance building, pursuant to Section 6. Modeling has been provided demonstrating that all wetland basins on site meet bounce, inundation and runout control elevation requirements as detailed in Section 7(b).

Staff and the District Engineer have reviewed the permit application and have found it to be complete and compliant with all Stormwater Management Rule requirements, subject to maintenance declaration and financial assurance.

Wetland Protection and Wetland Buffers

Per section 4(a)(1-2) of the Wetland Protection Rule, a wetland buffer is required on a wetland disturbed by placement of a new storm sewer structure, or one that is downstream of new or reconstructed impervious surface (cart path). Buffer width is based on the management classification of the wetland, established by the District's Functional Assessment of Wetlands (FAW). This Project consists of Manage 1, 2, and 3 wetlands which require 40, 30, and 20 foot buffers, respectively. The project is required to provide 2.87 acres of wetland buffer, which includes buffers around the entirety of wetland 17, and downgradient of the new cart paths for wetlands 2, 5, 6, 7, 18, and 23, as shown in Attachment D and by the table below.

Wetland 2, shown in the table below, is proposed to receive 38,431 square feet of buffer, but not immediately downgradient of the cart path. Wetland 8 is not required to have buffers but is proposed to have 27, 512 square feet of buffer. Together, these wetlands will provide 1.51 acres of natively planted buffer. While not eligible as wetland buffer, the applicant is also proposing 2.26 acres of low maintenance fescue grass around wetlands 2, 5, 7 and 23.

Wetland ID	Management Class	Required Buffer (SF)	Proposed Buffer (SF)	Non-Required Buffer (SF)	Non Eligible Fescue Grass Buffers (SF)
2	1	30,686	0	38,341	23,750
4	3	0	0	0	0
5	2	34,975	0	0	33,074
6	3	9,788	0	0	0
7	3	9,377	0	0	26,127
8	2	0	0	27,512	0
16	2	0	0	0	0
17	2	19,234	0	0	0
18	2	4,034	0	0	0
23	3	17,298	0	0	15,600
24	2	0	0	0	0
		125,392 SF (2.87 ac)	**0 ac**	**1.51 ac**	**98,552 SF (2.26 ac)**

Exception Request

Applicant Constraints:

The Applicant is proposing to meet the wetland buffer shortfall via an exception to the Wetland Protection Rule. The Applicant cites design constraints focused on minimizing permanent wetland impacts and adhering to U.S. Golf Association (USGA) standards, which guide against taller naturalized vegetation in areas of "essential golf features" such as greens, tees, fairways, bunkers, and water features in order to maintain visibility and safety. The applicant has evaluated the potential to relocate cart paths in certain locations to accommodate buffers and has found that this would require increased impervious surface due to longer and more circuitous routes.

MCWD Board Exception Criteria:

The MCWD Board of Managers may grant an exception from a particular water resource standard, such as a required wetland buffer, if it determines that an alternative approach proposed by the Applicant would achieve at least the same degree of water resource outcome as conformance to the standard.

Unlike an application for a variance, an application for an exception need not demonstrate need for the exception, simply that the proposal "*would achieve water resource outcomes of the type that the Board intends the standard, specification or method to achieve, and would do so to at least the same degree.*"

Applicant Exception Proposal:

The Applicant has proposed an exception to providing 2.87 acres of wetland buffers in the required locations. In lieu of the required buffer, Applicant proposes the following:

- Removal of historic wetland fill and restoration of 3.93 acres of wetland, comprising:
    - 1.62 acres of open water
    - 1.53 acres of wet meadow
    - 0.78 acres of shallow marsh
- 1.51 acres of wetland buffer in locations not required, where they do not interfere with play

Additional Elements:

Other proposed elements offered for additional water resource benefit include:

- A 1.95-acre reduction in site hardcover from 5.43 to 3.48 acres
- 2.26 acres of low maintenance fescue in areas where wetland buffers are required
- 3,266 cubic yards, or 2 acre-feet, of additional 100-year floodplain storage
- New irrigation system estimated to reduce water consumption by 4.7M to 6.3M gallons per year (30-40%)
- Improved grass varieties estimated to reduce pesticide use by 40%, from 8-10 applications/year to 3-6
- Reduced fertilizer inputs by an estimated 20%. Burl Oaks is a phosphorus free course

Exception Analysis

In evaluating the Applicant's proposal, staff, the District Engineer and wetland consultants from Moore Engineering assessed whether the alternative approach being proposed would achieve improved water resource outcomes of the type that the Board intends via the buffer standards within the Wetland Protection Rule.

Exception Guidelines:

To guide that analysis, staff considered the Board of Managers' stated policy of the Wetland Protection Rule, to protect and enhance the quantity, quality and biological diversity of Minnesota's wetlands by limiting direct and indirect impacts and fostering the restoration of wetlands.

Also considered were the specific functions of wetland buffers, required under the Wetland Protection Rule, which serve to filter sediment and pollutants from stormwater runoff, provide wildlife habitat through diverse vegetative communities, and mitigate flooding by slowing down the peak rate of runoff and acting as sponges through evapotranspiration.

Required Buffers and Existing Conditions:
As stated previously, the rule requires 2.87 acres of wetland buffers across 7 wetlands within the Burl Oaks Golf Course project, based on the reconstruction of hard surfaces associated with cart paths, and the placement of storm sewer inlets and outlets on the banks of wetlands.

Buffers in these locations are intended to filter stormwater runoff from the cart paths, improving water quality, and to mitigate the impact of placing structures within the bank of the wetland by providing vegetative structure and wildlife habitat. It is worth observing that, in many locations, cart paths are a significant distance away from both the wetland edge and wetland buffer and are separate by large areas of turf grass. Similarly, many of the site's wetlands have been the subject of past impact from the placement of structures or through excavation. Based on evaluations completed via the Minnesota Routine Assessment Method (MNRAM), these wetlands' primary function in their current excavated state is to provide stormwater management and pollutant filtering for downstream receiving waters. Implementation of wetland buffers in these locations would provide some stormwater filtering, but based on MNRAM analysis would not provide ecological lift sufficient to improve the overall management classification given these wetlands are not expected to provide significant quality of aquatic or terrestrial habitat.

Wetland Buffer Equivalents:
While the applicant is not proposing buffers in required locations downstream of cart paths, 1.51 acres of natively planted buffers are being proposed around Wetland 2 and 8. These buffers represent 52% of the total required buffer acreage and will provide additional water quality filtering and habitat functions in these locations.

Wetland Restoration:
A central consideration in the Exception analysis is the Board of Managers' stated policy within the Wetland Protection Rule to enhance the quantity, quality and biological diversity of Minnesota's wetlands by limiting direct and indirect impacts and fostering the restoration of wetlands. Wetland buffers serve a subset of this overarching policy directive, by limiting indirect impacts to wetlands, and enhancing the quality and biological diversity of Minnesota's wetlands.

The applicant proposes to remove historic wetland fill, placed to facilitate development of the golf course in the 1960s, and restore 3.93 acres of wetlands directly through excavation to native grades at or below 956', to reach hydric soil map units and the area's wetland hydrology determined from the original wetland delineation. These areas will be natively seeded as detailed in Appendix A of the proposed restoration plan (Attachment E). MCWD sought the opinion of wetland restoration professionals with Moore Engineering who found the proposal to provide a feasible strategy to restore wetland communities, based on the presence of hydric soils, area hydrology, and the proposed grading and seeding plan (Attachment F).

This proposal enhances the quantity and quality of wetlands and reverses direct impacts to wetlands through active restoration of 1.62 acres of open water, 1.53 acres of wet meadow, and 0.78 acres of shallow marsh. This is significant, since permitted wetland impacts are often guided away from site specific mitigation and towards wetland bank mitigation outside of MCWD's jurisdiction, by federal policy, thereby reducing the overall quantity and quality of wetlands within the watershed.

In terms of water quality, research indicates that a combination of wetland types enhances nitrogen and phosphorus retention, by increasing contact time between water and biological processes, where plant and microbial communities vary in their ability to uptake nutrients (Kaldec and Wallace, 2009; Chapin et al., 2011). This is important, as this wetland sits at the downstream end of the treatment train within the golf course, receiving over 90% of the site's drainage after it passes through other wetland systems and before it is ultimately discharged to Painter's Marsh to the west.

The inclusion of varied wet meadow and shallow marsh areas—with differing water depths—significantly enhances vegetation diversity and interspersion. Wetlands that combine interspersed vegetation with open water tend to support a greater diversity and abundance of fish and wildlife than areas with dense, uniform vegetation. Contiguity, or the connectedness of restored habitat, is also an important factor because it enhances ecological processes and supports biodiversity and resilience. Many species require large, connected landscapes to find food, mates and breeding sites. Similarly, many plant species depend on pollinators which require larger connected habitats to thrive. The proposed

restoration will ultimately be contiguous with larger wetlands to the west and east, as part of Wetland 23, as compared to the fragmented wetland buffers that might otherwise be dispersed inside the course where people are playing golf.

A MNRAM analysis completed for this proposal supported this assessment, showing ecological lift in categories of vegetative diversity and wildlife habitat structure, and raising Wetland 23 from a Manage 3 to a Manage 1 classification.

Storage and Flood Mitigation:
Wetland buffers also help attenuate flood flows. Native plant stem density slows peak flows and provides volume attenuation through evapotranspiration. The applicant has proposed a grading plan that cumulatively provides 3,266 cubic yards, or 2 acre-feet, of additional floodplain storage. While not permanently maintained through a declaration, this storage will be delivered into a permanent state through the implementation of mass grading. Future grading within the floodplain would be subject to MCWD permitting and require no net loss of storage.

Additional Considerations
Wetland Buffer Equivalents:
The applicant is proposing 2.26 acres of low maintenance fescue that will not receive irrigation or pesticide and fertilizer applications. This is not eligible as wetland buffer, generally due to it being a monoculture, receiving periodic mowing, and not being permanently protected through a declaration. However, this area will provide water quality function resembling wetland buffers and represents 79% of the total wetland buffer required.

Reduced Management Inputs:
Golf courses can contribute to nutrient loading in adjacent waterbodies through runoff. Leaching of phosphorus and nitrogen can occur with overapplication and overirrigation. However, since watershed stormwater regulations traditionally focus on managing runoff from impervious surface, runoff from greenspace is typically not the subject of stormwater regulation, and industry pollutant loading models do not capture the actual nutrient cycling associated with golf courses.

Industry best practices for reducing these potential impacts include reduced and precision application of fertilizer and pesticide, and efficient irrigation management to reduce the potential for leaching. While these actions would not be subject to an ongoing commitment enforceable by the District, information submitted by the Burl Oaks Golf Course Superintendent (Attachment G) plans to reduce irrigation, pesticide and fertilizer use with the course. This is part of what might be considered an evolving conservation ethic within the next generation of golf course managers.

At Burl Oaks, this is proposed to be accomplished through new bent grass selections with improved disease resistance, implementation of low maintenance fescue, and a redesigned irrigation system that will replace aging pump infrastructure, improved sprinkler layout, and optimized scheduling and zoning programming, to reduce overwatering, fine tuning to specific turf needs, which also improved aesthetics, play and economics for the course. Fertilizer applications will not be based on broadcast rates, but tailored to course needs through site specific soil testing and plant tissue health testing.

- New irrigation system estimated to reduce water consumption by 4.7M to 6.3M gallons per year (30-40%)
- Improved grass varieties estimated to reduce pesticide use by 40%, from 8-10 applications/year to 3-6
- Reduced fertilizer inputs by an estimated 20%. Burl Oaks is a phosphorus free course.

Burl Oaks Superintendent has committed to providing annual reports outlining management inputs into the course.

Summary and Conclusion:
Burl Oaks Golf Club has applied for a Minnehaha Creek Watershed District permit under the Erosion Control, Floodplain Alteration, Waterbody Crossings and Structures, Stormwater Management Rules, and an exception to section 4(a) (1-2) of the Wetland Protection Rule, which requires buffer where a new storm sewer structure is placed within a wetland and downstream of new or reconstructed impervious surface.

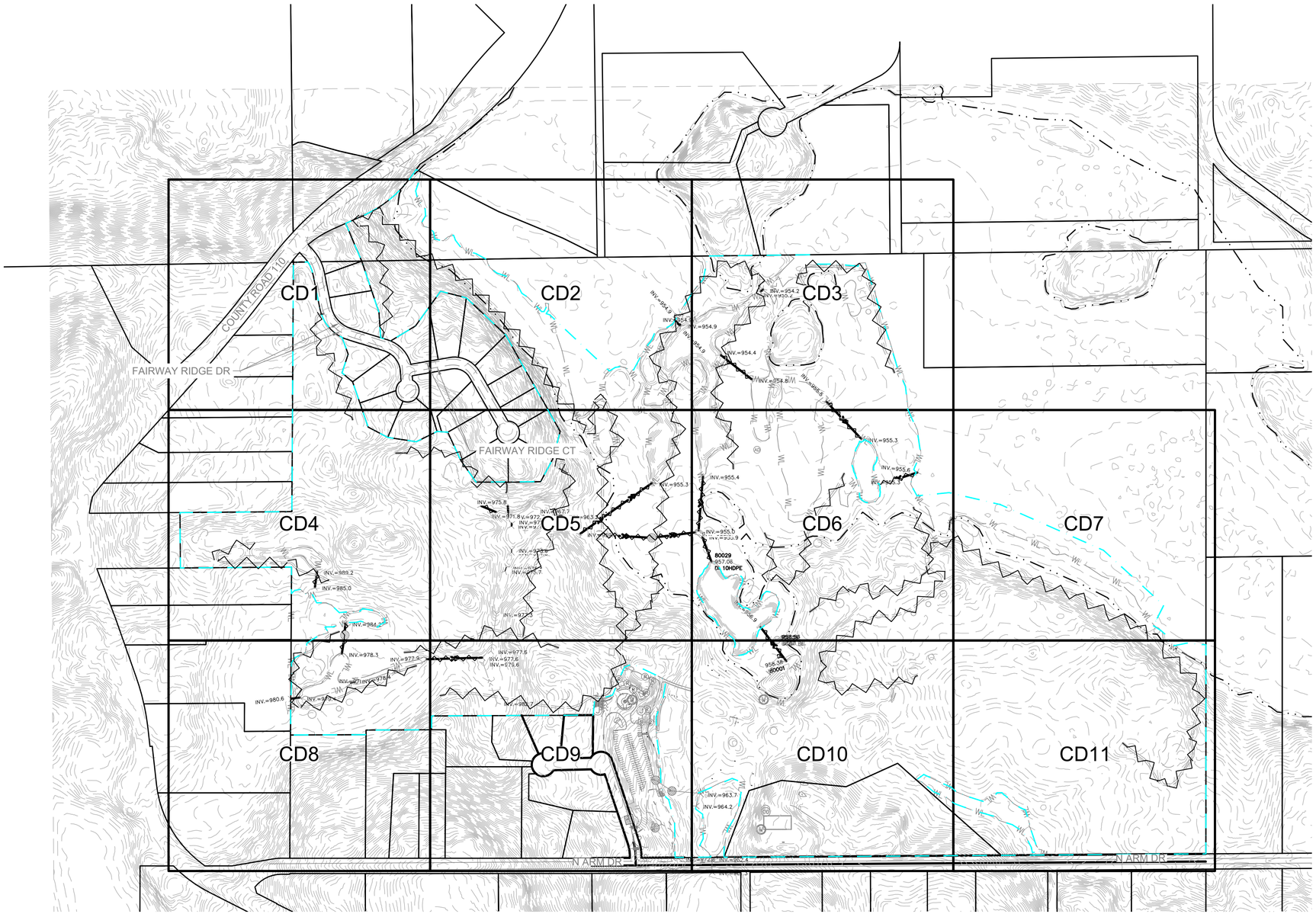
The Applicant has proposed the restoration of a historically manipulated wetland, resulting in 3.93 acres of restored wetlands on site, in addition to the establishment of 1.51 acres of wetland buffer in non-required areas, 3,266 cubic

yards of additional floodplain storage throughout the site, and 2.26 acres of low-maintenance fescue areas in required buffer locations.

MCWD staff and the District Engineer have evaluated the exception request by assessing the functions the required buffers, in the existing setting, would serve for water quality, habitat and vegetation, and flood storage, and comparing to the Applicant's proposed alternative measures. Staff and the Engineer find that the Applicant has provided sufficient evidence to demonstrate that the proposed project will achieve water resource outcomes equivalent to or greater than full rule compliance.

Recommendation:
Therefore, staff recommend approval of the requested exception, and the permit application, with the conditions listed at the beginning of this report.

Attachments
Attachment A: Construction Plans
Attachment B: Floodplain Exhibit
Attachment C: Waterbody Crossings Exhibit
Attachment D: Wetland Buffer Exhibit
Attachment E: Anderson Engineering Restoration Memo
Attachment F: Moore Engineering Restoration Review Memo
Attachment G: Turf Input Summary



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LEGEND

- PROPERTY LIMITS
- EXISTING STORM SEWER
- EXISTING STORM SEWER INLET
- REMOVE EXISTING UTILITY LINE
- FLOODPLAIN BOUNDARY
- CONSTRUCTION LIMITS
- DELINEATED WETLAND (WL)
- GOLF FEATURES (GREENS & TEES)
- REMOVE CART PATH

ANDERSON

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P 763.412.4000 | F 763.412.4090
Anderson Engineering of Minnesota, LLC

BURL OAKS - COURSE RENOVATION PROJECT

5400 N ARM DR
MINNETRISTA, MN 55364

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

PRINT NAME: ADAM THIELE, PE

SIGNATURE: NOT FOR CONSTRUCTION

DATE: 01/16/2025 LICENSE NO. 51317

REVISION LOG

NO.	DATE	DESCRIPTION OF REVISIONS
1	02/09/25	REVISED PER MCWD COMMENT
2	02/18/25	REVISED WETLAND RESTORATION

MCWD PERMIT APPLICATION

01/16/2025

DESIGNED:	DRAWN:	CHECKED BY:
AT	JR	AT

DRAWING TITLE

OVERALL DEMOLITION PLAN

DRAWING NO.

CD0

PLOTTED:	COMM. NO.
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LEGEND

- PROPERTY LIMITS
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KEY NOTES

1. CONTRACTOR SHALL INSTALL ALL EROSION CONTROL BMPS PRIOR TO BEGINNING ANY EARTH DISTURBING ACTIVITIES INCLUDING CLEARING & GRUBBING OR TREE REMOVALS.
2. CONTRACTOR SHALL COMPLETELY REMOVE ITEMS NOTED FOR DEMOLITION & PROMPTLY REMOVE DEBRIS FROM THE PROPERTY.
3. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PROTECT EXISTING IMPROVEMENTS NOT NOTED FOR DEMOLITION.

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MCWD PERMIT APPLICATION
01/16/2025

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AT	JR	AT

DRAWING TITLE

DEMOLITION PLAN

DRAWING NO.

CD1

PLOTTED:	COMM. NO.
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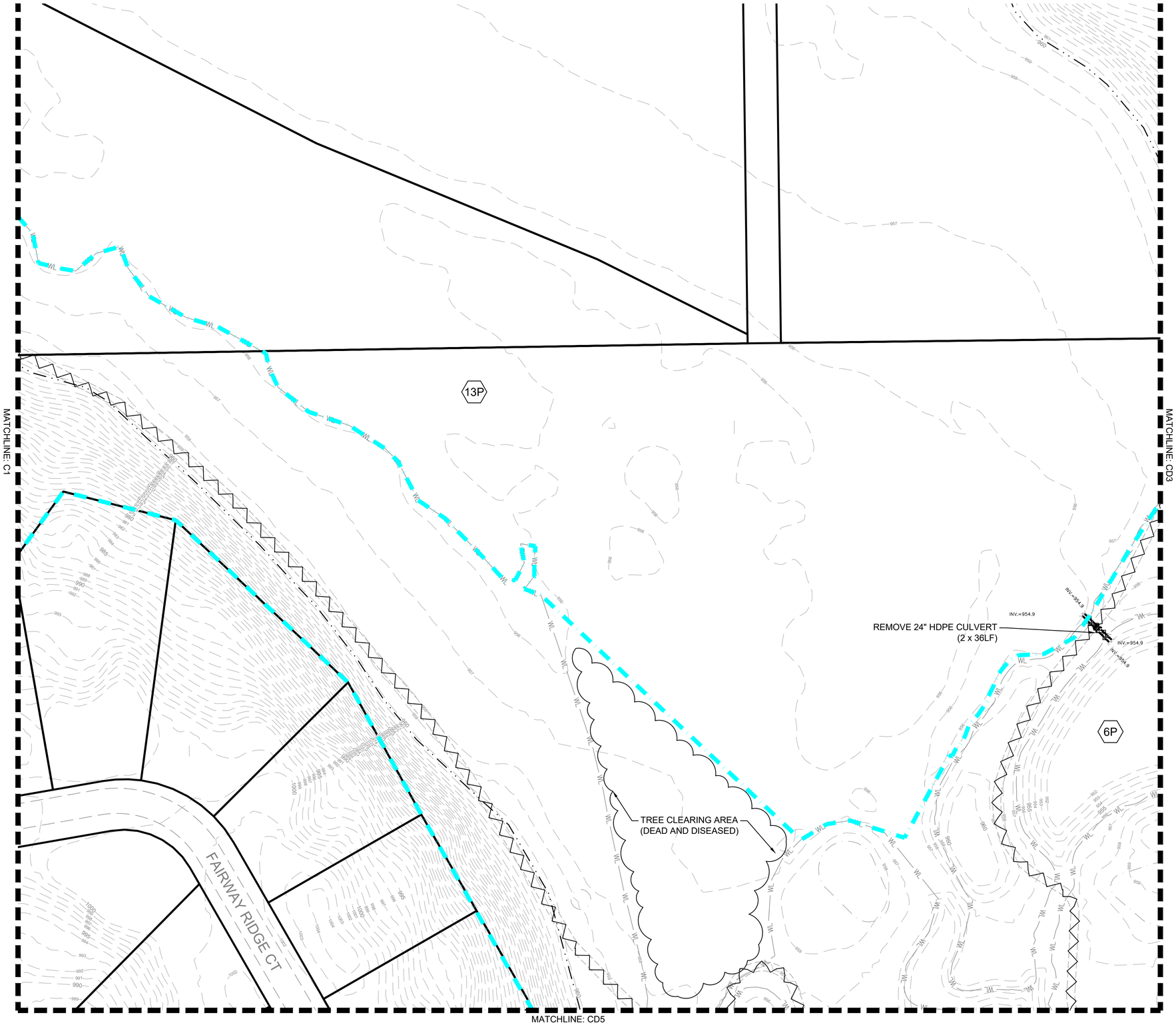

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MCWD PERMIT APPLICATION
01/16/2025

DESIGNED:	DRAWN:	CHECKED BY:
AT	JR	AT

DRAWING TITLE

DEMOLITION PLAN

DRAWING NO.

CD2

PLOTTED:	COMM. NO.
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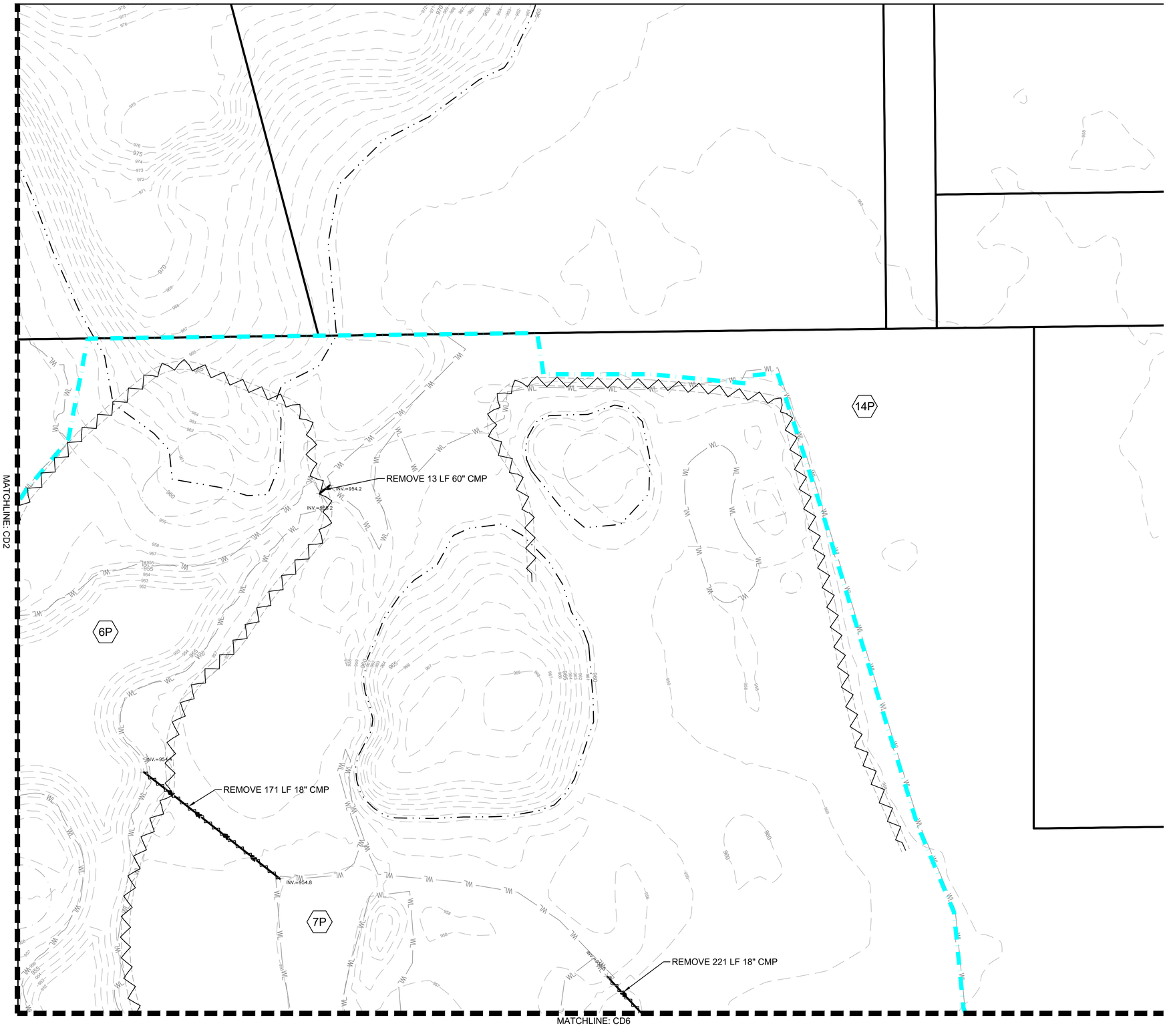

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BURL OAKS - COURSE RENOVATION PROJECT

5400 N ARM DR
MINNETRISTA, MN 55364

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

PRINT NAME: ADAM THIELE, PE

SIGNATURE: NOT FOR CONSTRUCTION

DATE: 01/16/2025 LICENSE NO. 51317

REVISION LOG

NO.	DATE	DESCRIPTION OF REVISIONS
1	02/09/25	REVISED PER MCWD COMMENT
2	02/18/25	REVISED WETLAND RESTORATION

MCWD PERMIT APPLICATION
01/16/2025

DESIGNED:	DRAWN:	CHECKED BY:
AT	JR	AT

DRAWING TITLE

DEMOLITION PLAN

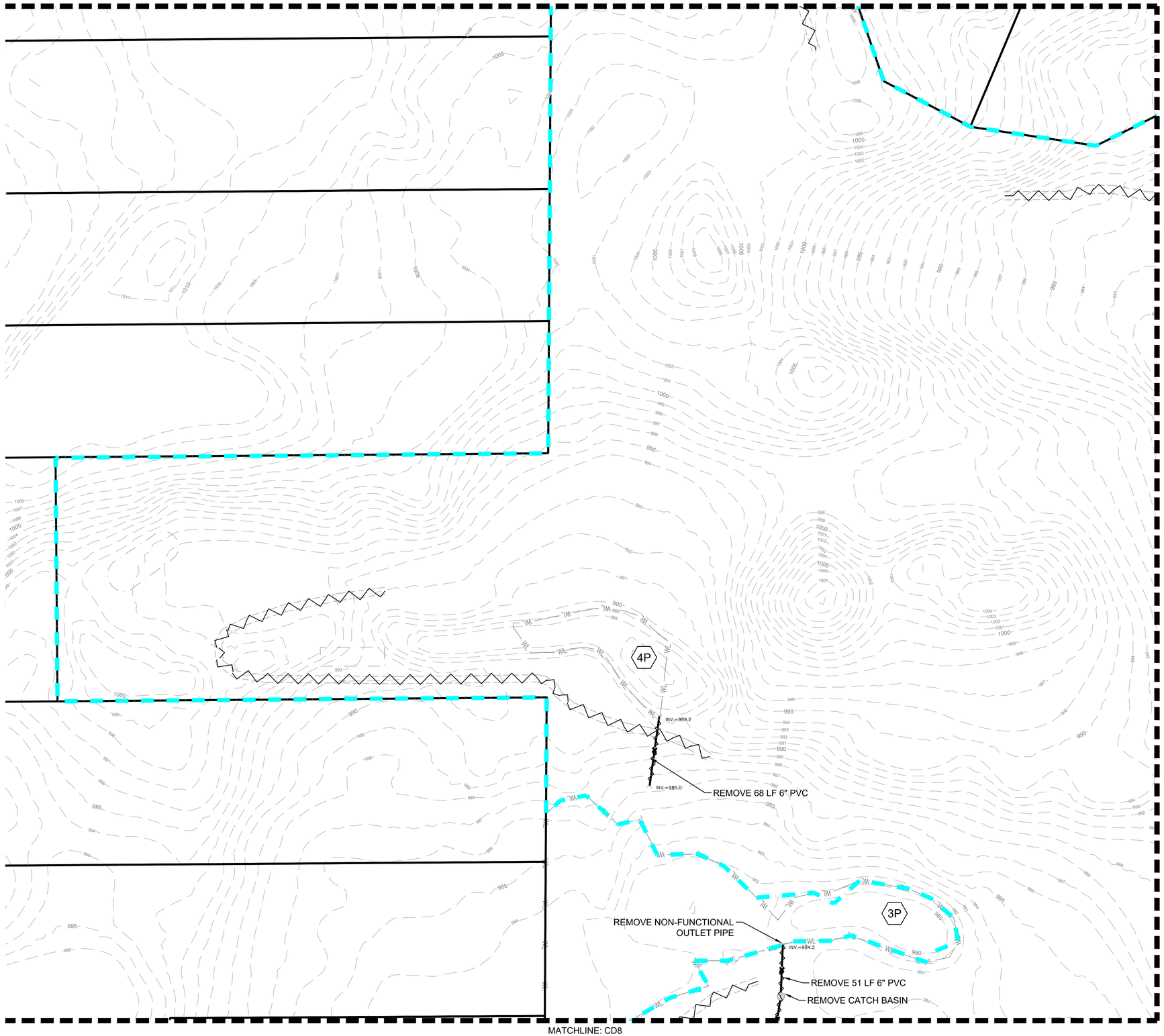
DRAWING NO.

CD3

PLOTTED:	COMM. NO.
---	17652

Feb 21, 2025 - 12:38am AThiele
Y:\17600\17652\ BURL OAKS - COURSE RENOVATION PROJECT_ 07 Civil_ 01 CAD files_ 01 SHEETS\17652 C_ DEMO.dwg
Xref Filename: \ 17652_ s_ base \ 17652 22x34 AE Commercial Title Block \ 4.30.24 -g-grading plan \ 17041_ 15783_ S_ BASE \ 17041 22x34 AE Commercial Title Block \ 13709_ BOGC_ Wetland_ NOD\

MATCHLINE: CD1



MATCHLINE: CD8

MATCHLINE: CD5

N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- EXISTING STORM SEWER
- EXISTING STORM SEWER INLET
- REMOVE EXISTING UTILITY LINE
- FLOODPLAIN BOUNDARY
- CONSTRUCTION LIMITS
- DELINEATED WETLAND (WL)
- GOLF FEATURES (GREENS & TEES)
- REMOVE CART PATH

KEY NOTES

1. CONTRACTOR SHALL INSTALL ALL EROSION CONTROL BMPS PRIOR TO BEGINNING ANY EARTH DISTURBING ACTIVITIES INCLUDING CLEARING & GRUBBING OR TREE REMOVALS.
2. CONTRACTOR SHALL COMPLETELY REMOVE ITEMS NOTED FOR DEMOLITION & PROMPTLY REMOVE DEBRIS FROM THE PROPERTY.
3. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PROTECT EXISTING IMPROVEMENTS NOT NOTED FOR DEMOLITION.

ANDERSON

13605 1st Avenue N. #100
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MCWD PERMIT APPLICATION
01/16/2025

DESIGNED:	DRAWN:	CHECKED BY:
AT	JR	AT

DRAWING TITLE

DEMOLITION PLAN

DRAWING NO.

CD4

PLOTTED:	COMM. NO.
----	17652

Feb 21, 2025 - 12:38am ATheile
Xref Filename: \ 17652__s__base \ 17652 22x34 AE Commercial Title Block \ 4.30.24 +grading plan \ 17041__15783__S__BASE \ 17041 22x34 AE Commercial Title Block \ 13708__BOGC__Wetland_NOD
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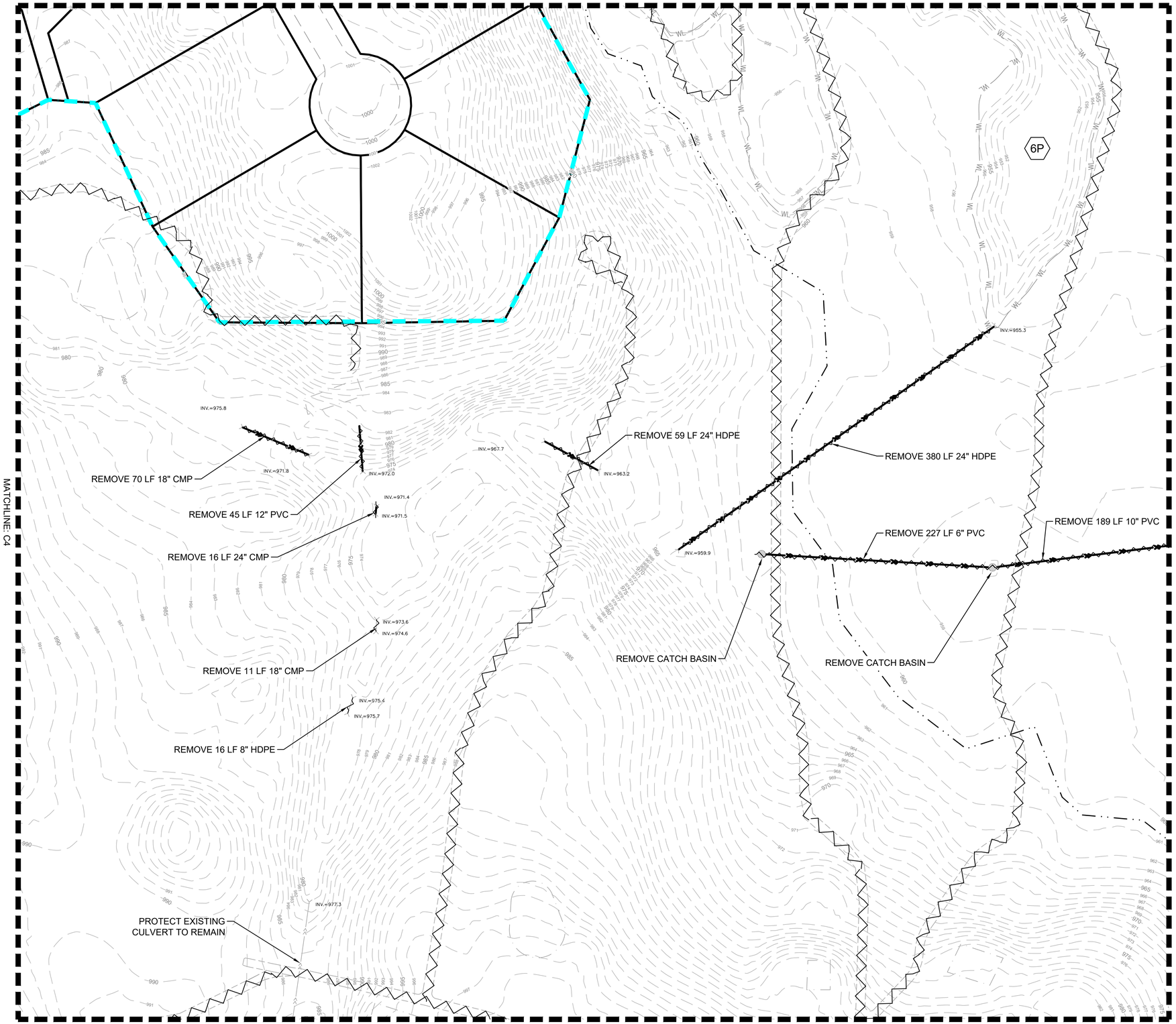
MATCHLINE: CD2

MATCHLINE: C4

MATCHLINE: CD6

MATCHLINE: CD8



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0 50' 100'

LEGEND

- PROPERTY LIMITS
- EXISTING STORM SEWER
- EXISTING STORM SEWER INLET
- REMOVE EXISTING UTILITY LINE
- FLOODPLAIN BOUNDARY
- CONSTRUCTION LIMITS
- DELINEATED WETLAND
- GOLF FEATURES (GREENS & TEES)
- REMOVE CART PATH

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01/16/2025

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AT	JR	AT

DRAWING TITLE

DEMOLITION PLAN

DRAWING NO.

CD5

PLOTTED:	COMM. NO.
----	17652

Feb 21, 2025 - 12:37am AThiele
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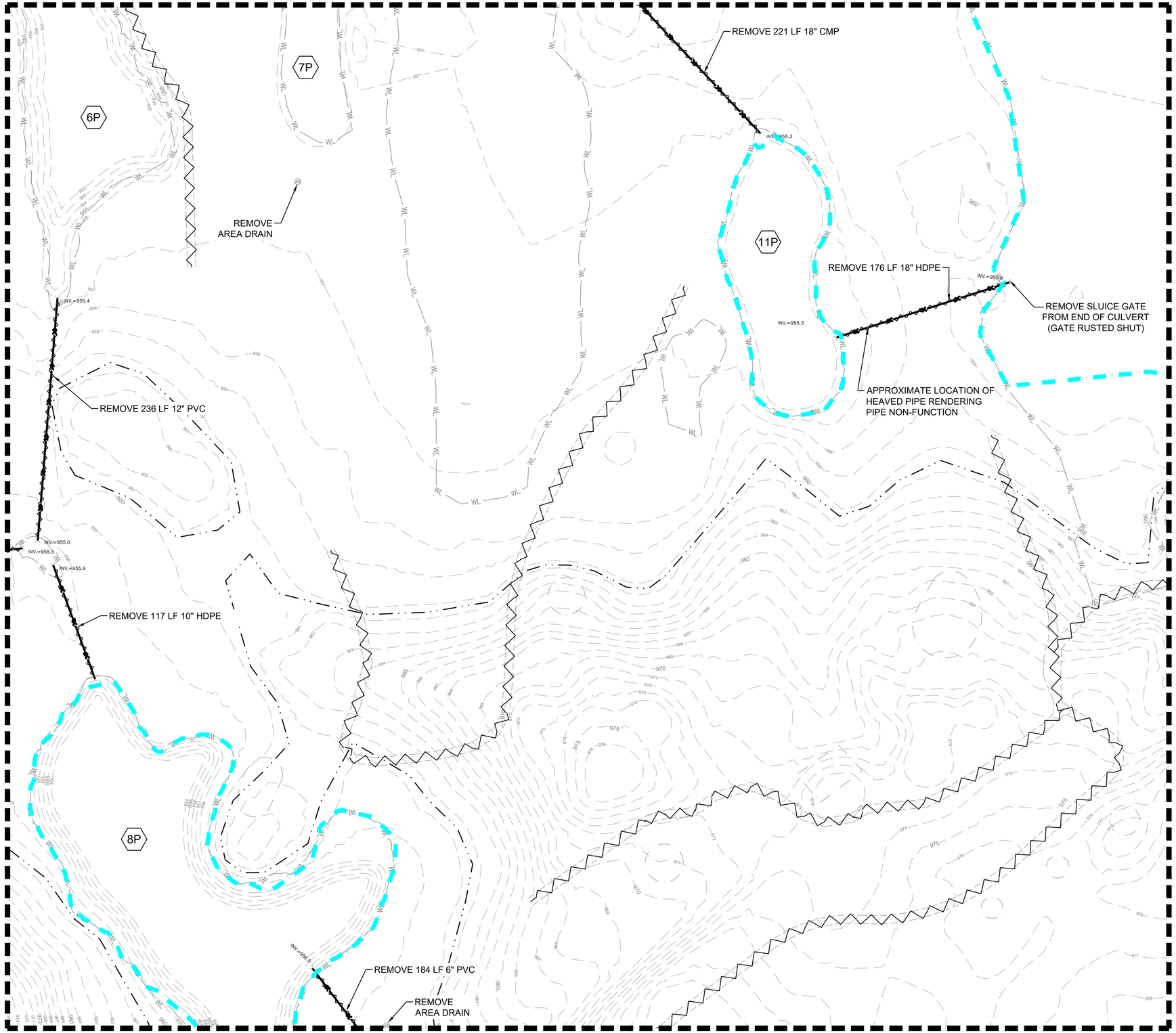
Xref Filename: \ 17652_ s_ base \ 17652 22x34 AE Commercial Title Block \ 4.30.24 -g-grading plan \ 17041_ 15783_ S_ BASE \ 17041 22x34 AE Commercial Title Block \ 13709_ BOGC_ Wetland_NO

MATCHLINE: CD3

MATCHLINE: CD5

MATCHLINE: CD7

MATCHLINE: CD10



N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- EXISTING STORM SEWER
- EXISTING STORM SEWER INLET
- REMOVE EXISTING UTILITY LINE
- FLOODPLAIN BOUNDARY
- CONSTRUCTION LIMITS
- DELINEATED WETLAND
- GOLF FEATURES (GREENS & TEES)
- REMOVE CART PATH

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DRAWING TITLE

DEMOLITION PLAN

DRAWING NO.

CD6

PLOTTED:	COMM. NO.
----	17652

Feb 21, 2025 - 12:37am ATheile
Xref Filename: \ 17652_ s_ base \ 17652 22x34 AE Commercial Title Block \ 4.30.24 -grading plan \ 17041_ 15783_ S_ BASE \ 17041 22x34 AE Commercial Title Block \ 13709_ BOGC_ Wetland_ NOD
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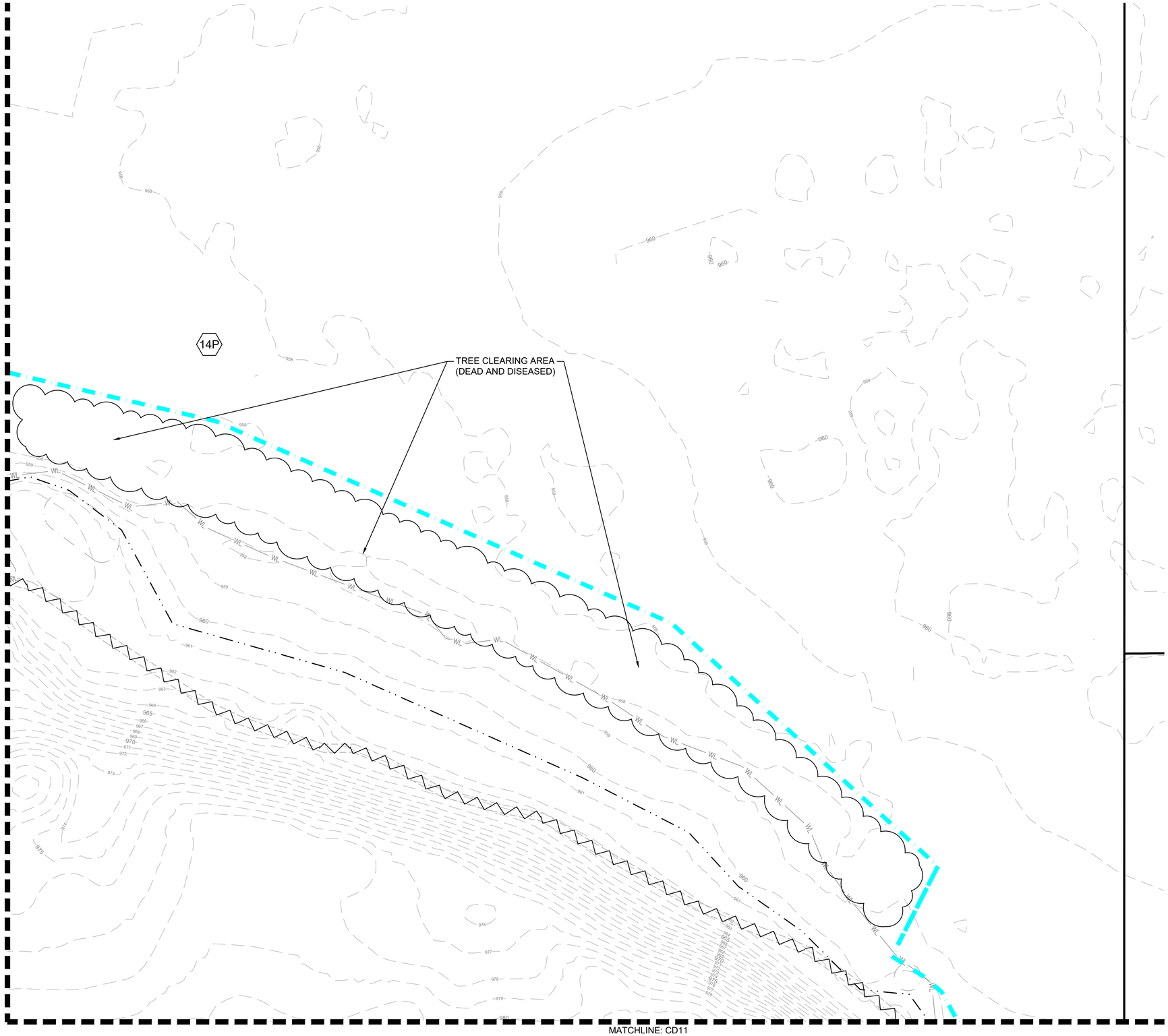

N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- EXISTING STORM SEWER
- EXISTING STORM SEWER INLET
- REMOVE EXISTING UTILITY LINE
- FLOODPLAIN BOUNDARY
- CONSTRUCTION LIMITS
- DELINEATED WETLAND
- GOLF FEATURES (GREENS & TEES)
- REMOVE CART PATH

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DRAWING TITLE

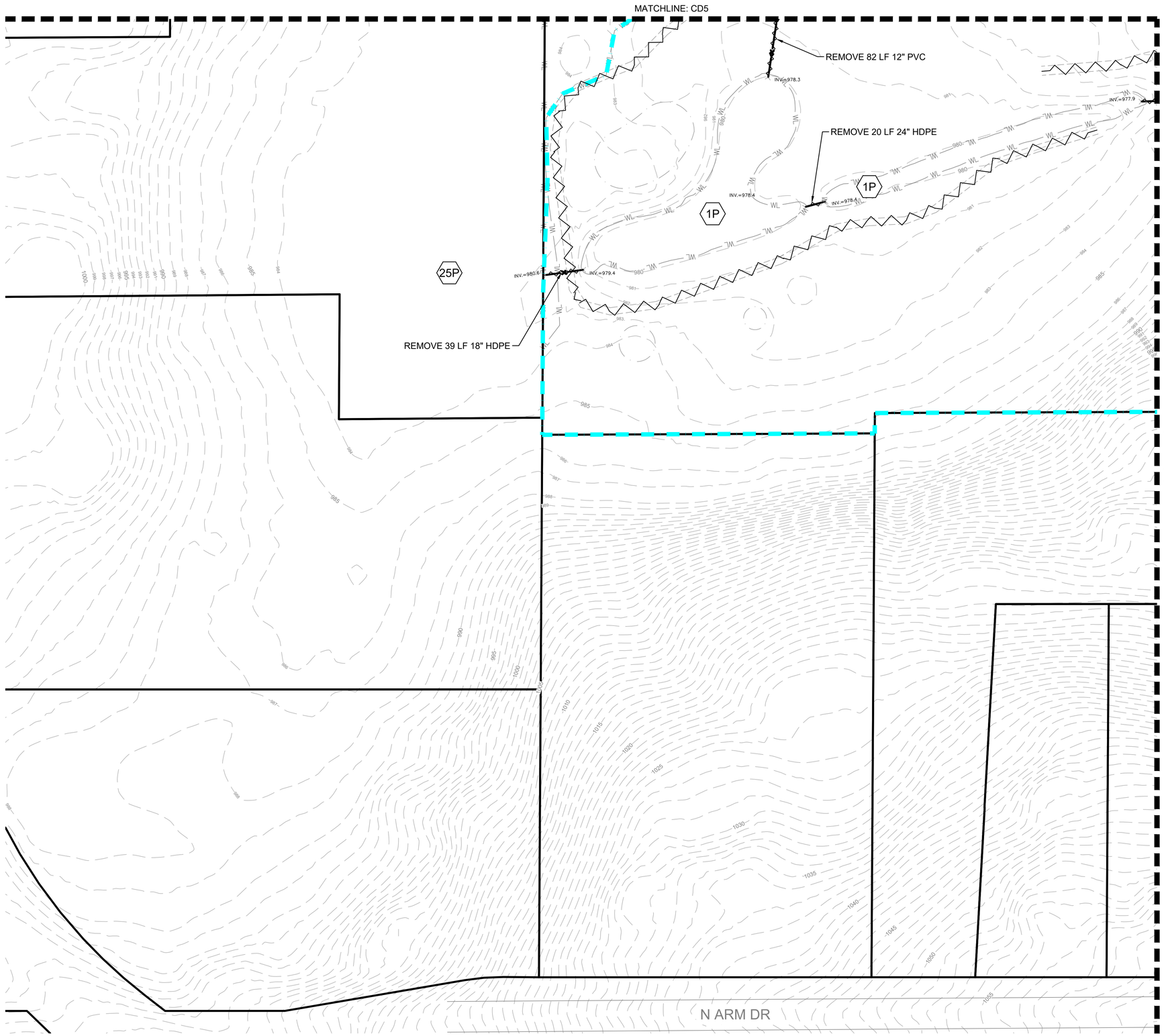
DEMOLITION PLAN

DRAWING NO.

CD7

PLOTTED:	COMM. NO.
----	17652

Feb 21, 2025 - 12:37am AThiele Y:\17600\17652 BURL OAKS - COURSE RENOVATION PROJECT_07 Civil_01 CAD files_01 SHEETS\17652 C_DEMO.dwg
Xref Filename: \ 17652_s_ base \ 17652 22x34 AE Commercial Title Block \ 4.30.24 -g-grading plan \ 17041_ 15783_ S_ BASE \ 17041 22x34 AE Commercial Title Block \ 13708_ BOGC_ Wetland_ NODE



N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- EXISTING STORM SEWER
- EXISTING STORM SEWER INLET
- REMOVE EXISTING UTILITY LINE
- FLOODPLAIN BOUNDARY
- CONSTRUCTION LIMITS
- DELINEATED WETLAND
- GOLF FEATURES (GREENS & TEES)
- REMOVE CART PATH

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DRAWING TITLE

DEMOLITION PLAN

DRAWING NO.

CD8

PLOTTED:	COMM. NO.
----	17652

Feb 21, 2025 - 12:37am ATheile
Xref Filename: \ 17652__s__base \ 17652 22x34 AE Commercial Title Block \ 4.30.24 -grading plan \ 17041__15783__S__BASE \ 17041 22x34 AE Commercial Title Block \ 13709_ BOGC__Wetland_ NOD\
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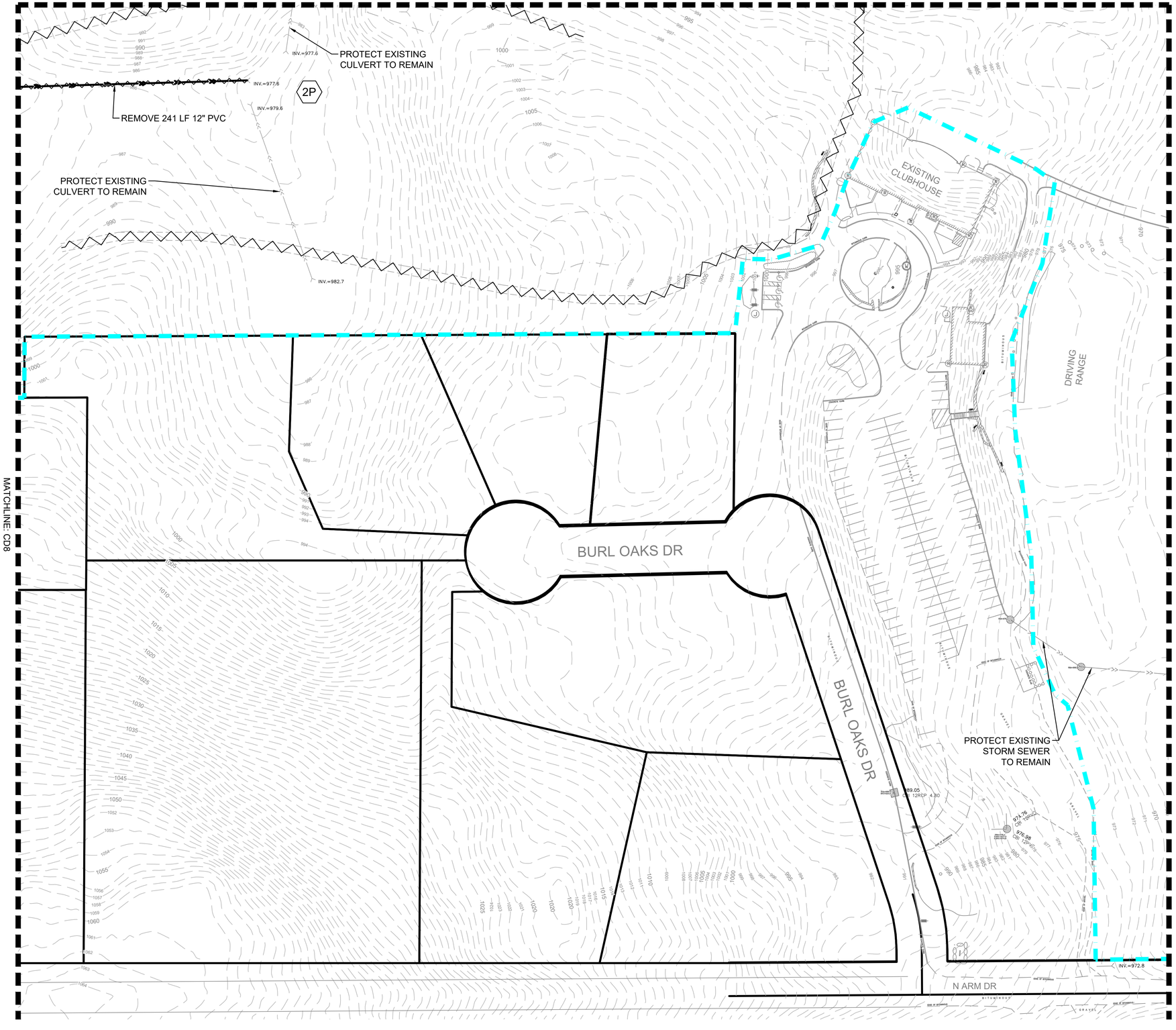
MATCHLINE: CD5



MATCHLINE: CD8

MATCHLINE: CD10

N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- EXISTING STORM SEWER
- EXISTING STORM SEWER INLET
- REMOVE EXISTING UTILITY LINE
- FLOODPLAIN BOUNDARY
- CONSTRUCTION LIMITS
- WL — DELINEATED WETLAND
- GOLF FEATURES (GREENS & TEES)
- REMOVE CART PATH

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DRAWING TITLE

DEMOLITION PLAN

DRAWING NO.

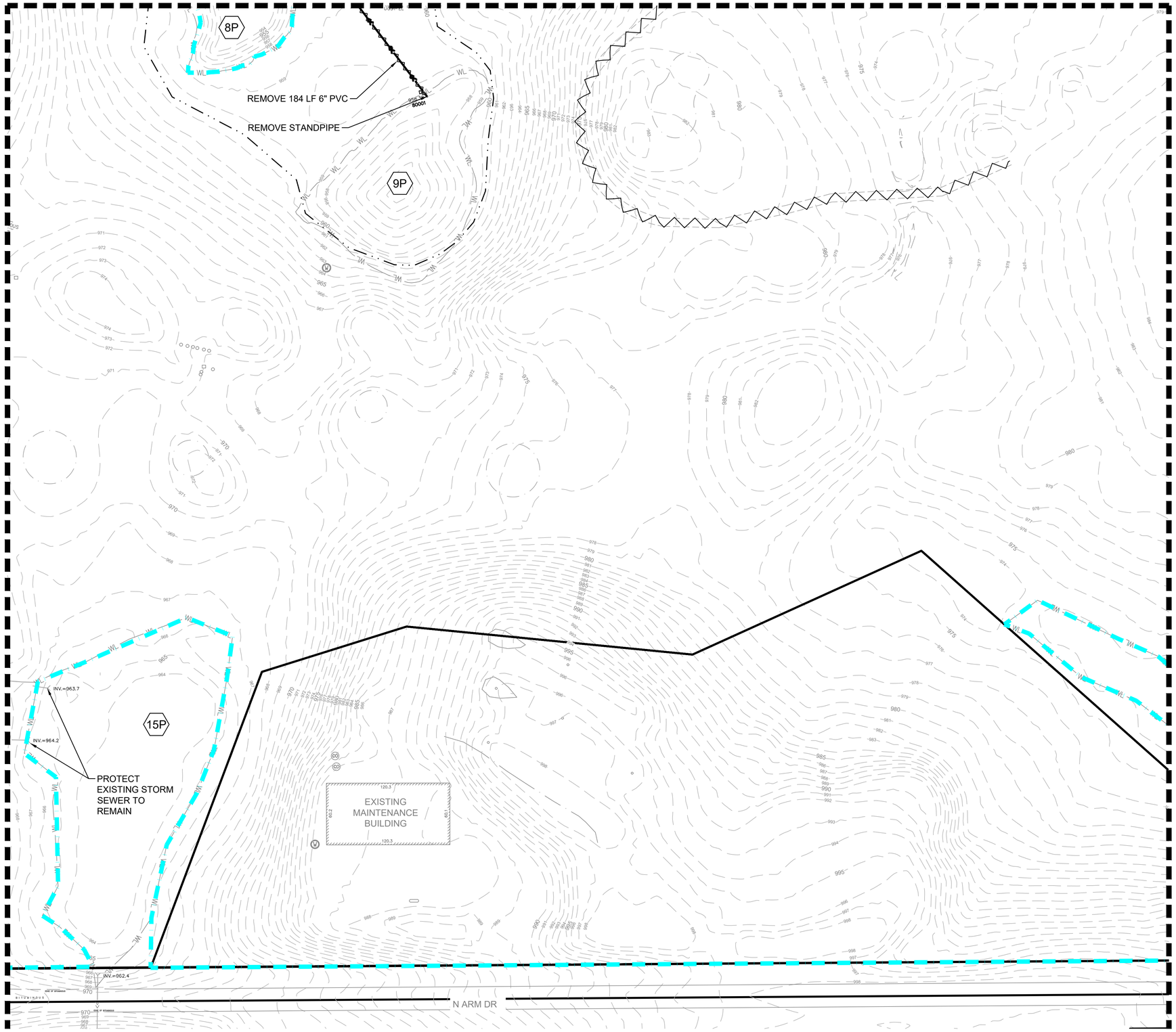
CD9

PLOTTED:	COMM. NO.
----	17652

MATCHLINE: CD6

MATCHLINE: CD9

MATCHLINE: CD11



N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- EXISTING STORM SEWER
- EXISTING STORM SEWER INLET
- REMOVE EXISTING UTILITY LINE
- FLOODPLAIN BOUNDARY
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DRAWING TITLE

DEMOLITION PLAN

DRAWING NO.

CD10

PLOTTED:	COMM. NO.
----	17652

Feb 21, 2025 - 12:37am ATHiele
Xref Filename: \ 17652_ s_ base \ 17652 22x34 AE Commercial Title Block \ 4.30.24 -g-grading plan \ 17041_ 15783_ S_ BASE \ 17041 22x34 AE Commercial Title Block \ 13709_ BOGC_ Wetland_ NDON
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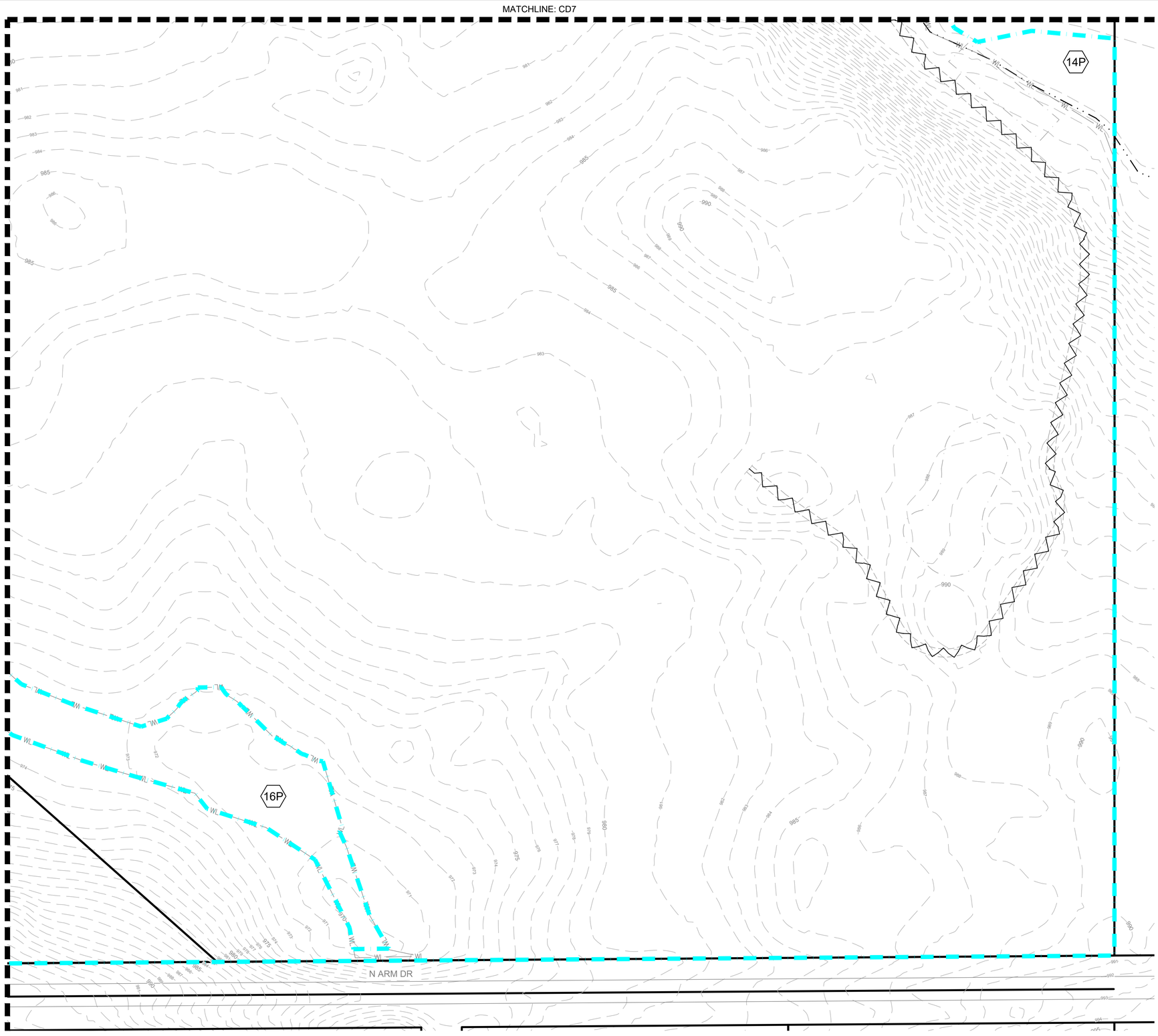

N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- EXISTING STORM SEWER
- EXISTING STORM SEWER INLET
- REMOVE EXISTING UTILITY LINE
- FLOODPLAIN BOUNDARY
- CONSTRUCTION LIMITS
- DELINEATED WETLAND
- GOLF FEATURES (GREENS & TEES)
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DRAWING TITLE

DEMOLITION PLAN

DRAWING NO.

CD11

PLOTTED:	COMM. NO.
----	17652

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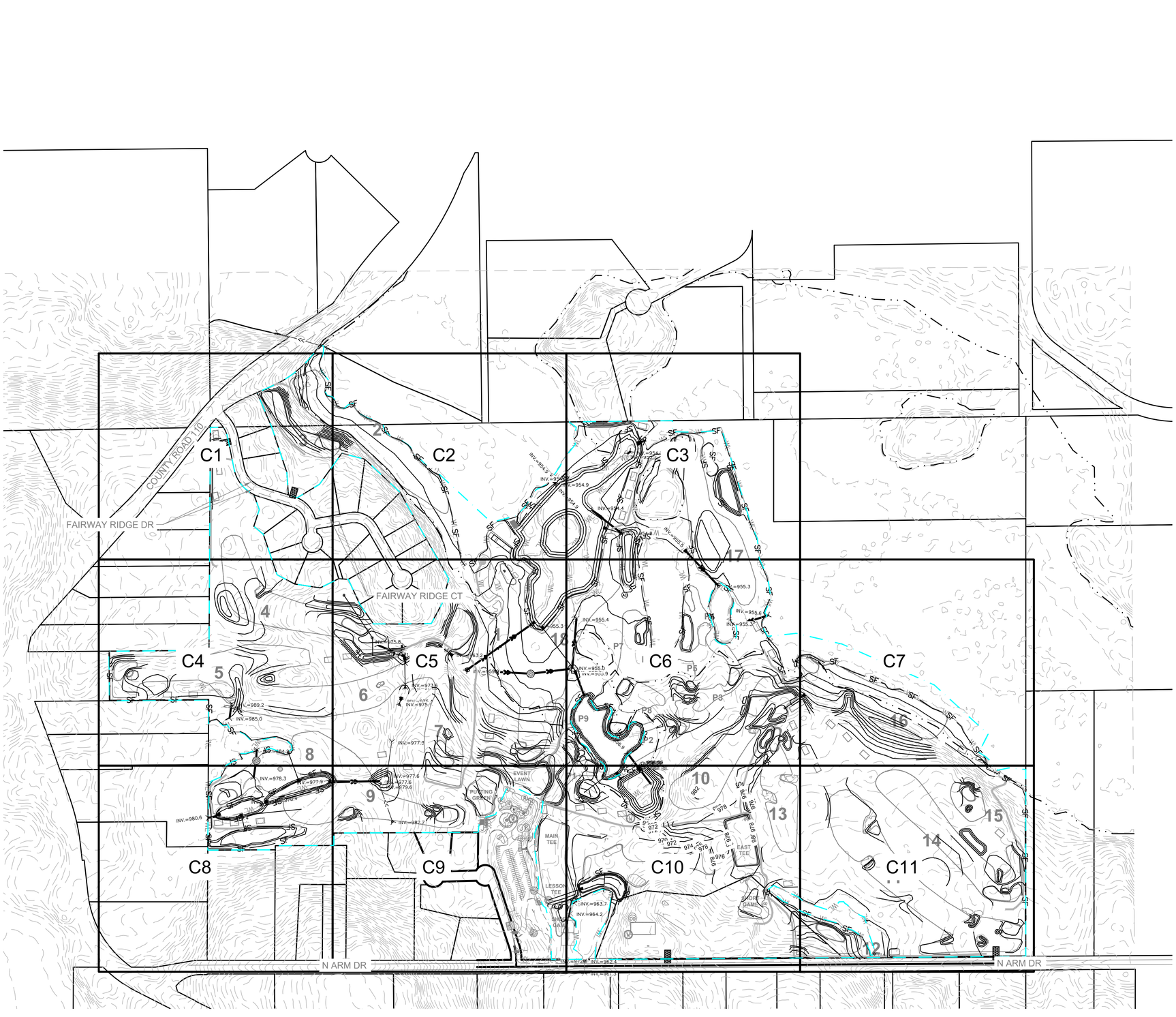
Xref Filename: \ 17652_ s_ base \ 17652 22x34 AE Commercial Title Block \ 4.30.24 -sj-grading plan \ 17041_ 15783_ S_ BASE \ 17041 22x34 AE Commercial Title Block \ 13709_ BOGC_ Wetland_ NODi



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AT	JR	AT

DRAWING TITLE

GRADING, DRAINAGE & EROSION CONTROL PLAN - OVERALL

DRAWING NO.

C0

PLOTTED:	COMM. NO.
----	17652

Feb 21, 2025 - 12:38am AThiele
Xref Filename: \ 17652__s__base \ 17652 22x34 AE Commercial Title Block \ 4.30.24 -p-grading plan \ 17041__15783__S__BASE \ 17041 22x34 AE Commercial Title Block \ 13709__BOGC__Wetland__NOD\
Y:\17600\17652 BURL OAKS - COURSE RENOVATION PROJECT__07 Civil__01 CAD files__01 SHEETS\17652 C__GRAD.dwg

N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- CONSTRUCTION LIMITS
- 966 EXISTING CONTOUR
- 966 PROPOSED CONTOUR
- DRAINAGE ARROW
- SF REDUNDANT SILT FENCE
- INLET SEDIMENT PROTECTION
- ROCK CONSTRUCTION ENTRANCE
- ×800.1 PROPOSED SPOT ELEVATION
- BITUMINOUS PATHWAY
- WL EXISTING WETLAND
- FLOODPLAIN BOUNDARY
- COURSE FEATURE (GREEN, TEE, FAIRWAY)
- EXISTING STORM SEWER
- PROPOSED STORM SEWER

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01/16/2025

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AT	JR	AT

DRAWING TITLE

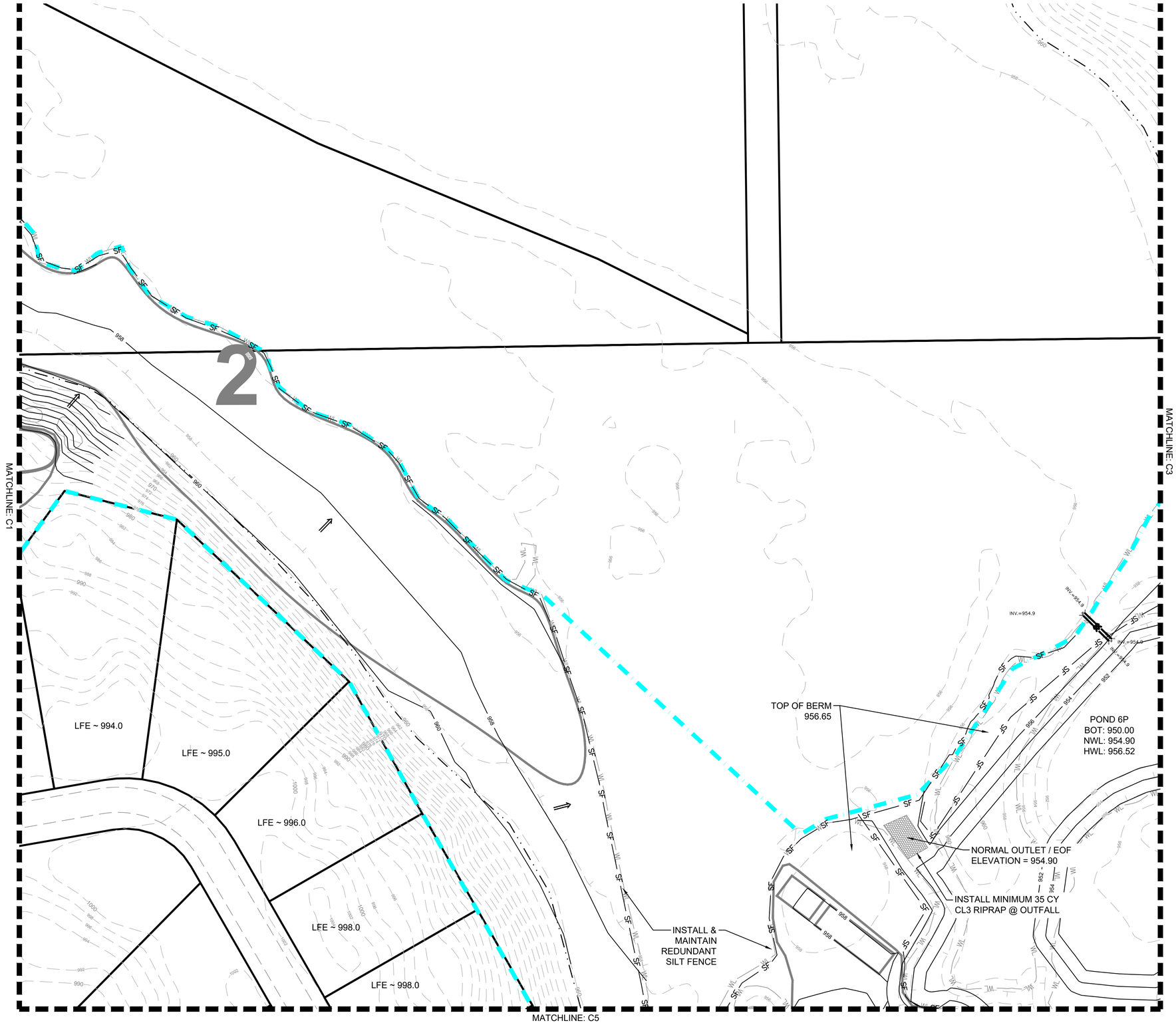
GRADING, DRAINAGE & EROSION CONTROL PLAN

DRAWING NO.

C1

PLOTTED:	COMM. NO.
----	17652

Feb 21, 2025 - 12:38am ATheile
Xref Filename: \ 17652_ s_ base \ 17652 22x34 AE Commercial Title Block \ 4.30.24 -grading plan \ 17041_ 15783_ S_ BASE \ 17041 22x34 AE Commercial Title Block \ 13709_ BOGC_ Wetland_ NOD\
Y:\17600\17652 BURL OAKS - COURSE RENOVATION PROJECT_ 07 Civil_ 01 CAD files_ 01 SHEETS\17652 C_ GRAD.dwg



N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- CONSTRUCTION LIMITS
- EXISTING CONTOUR
- PROPOSED CONTOUR
- DRAINAGE ARROW
- REDUNDANT SILT FENCE
- INLET SEDIMENT PROTECTION
- ROCK CONSTRUCTION ENTRANCE
- PROPOSED SPOT ELEVATION
- BITUMINOUS PATHWAY
- EXISTING WETLAND
- FLOODPLAIN BOUNDARY
- COURSE FEATURE (GREEN, TEE, FAIRWAY)
- EXISTING STORM SEWER
- PROPOSED STORM SEWER

ANDERSON

13605 1st Avenue N. #100
Plymouth, MN 55441 | ae-mn.com
P 763.412.4000 | F 763.412.4090
Anderson Engineering of Minnesota, LLC

BURL OAKS - COURSE RENOVATION PROJECT

5400 N ARM DR
MINNETRISTA, MN 55364

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PRINT NAME: ADAM THIELE, PE

SIGNATURE: NOT FOR CONSTRUCTION

DATE: 01/16/2025 LICENSE NO. 51317

REVISION LOG

NO.	DATE	DESCRIPTION OF REVISIONS
1	02/09/25	REVISED PER MCWD COMMENT
2	02/18/25	REVISED WETLAND RESTORATION

MCWD PERMIT APPLICATION
01/16/2025

DESIGNED:	DRAWN:	CHECKED BY:
AT	JR	AT

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GRADING, DRAINAGE & EROSION CONTROL PLAN

DRAWING NO.

C2

PLOTTED:	COMM. NO.
----	17652

Feb 21, 2025 - 12:38am ATheile
Xref Filename: \ 17652__s__base \ 17652 22x34 AE Commercial Title Block \ 4.30.24 +grading plan \ 17041__15783__S__BASE \ 17041 22x34 AE Commercial Title Block \ 13708__BOGC__Wetland_NOV
Y:\17600\17652 BURL OAKS - COURSE RENOVATION PROJECT__07 Civil__01 CAD files__01 SHEETS\17652 C_GRAD.dwg

N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- CONSTRUCTION LIMITS
- EXISTING CONTOUR
- PROPOSED CONTOUR
- DRAINAGE ARROW
- REDUNDANT SILT FENCE
- INLET SEDIMENT PROTECTION
- ROCK CONSTRUCTION ENTRANCE
- PROPOSED SPOT ELEVATION
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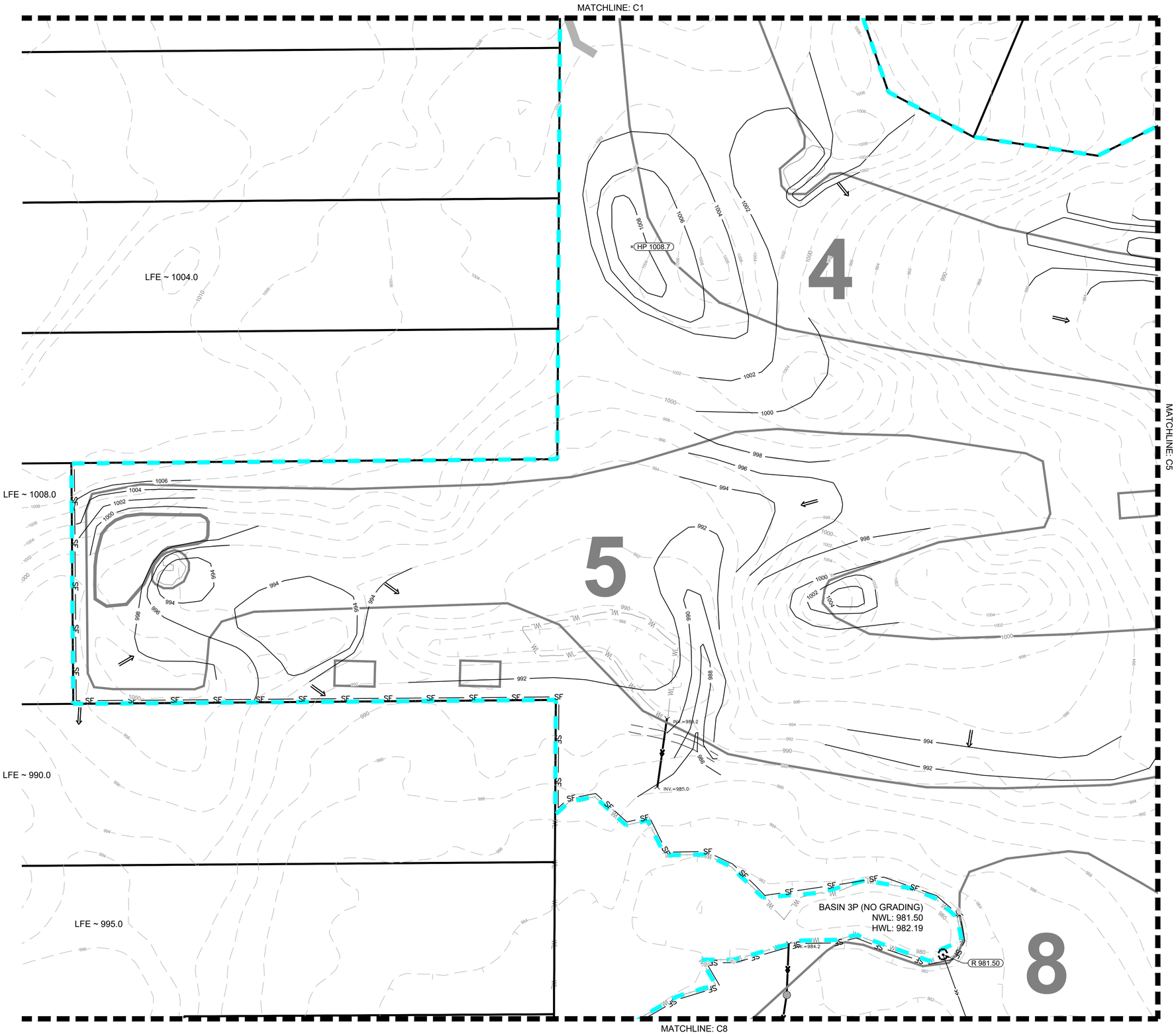
DRAWING NO.

C3

PLOTTED:	COMM. NO.
----	17652



N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- CONSTRUCTION LIMITS
- EXISTING CONTOUR
- PROPOSED CONTOUR
- DRAINAGE ARROW
- REDUNDANT SILT FENCE
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GRADING, DRAINAGE & EROSION CONTROL PLAN

DRAWING NO.

C4

PLOTTED:	COMM. NO.
----	17652

Feb 21, 2025 - 12:38am AThiele
Xref Filename: \ 17652_ s_ base \ 17652 22x34 AE Commercial Title Block \ 4.30.24 -sgrading plan \ 17041_ 15783_ S_ BASE \ 17041 22x34 AE Commercial Title Block \ 13709_ BOGC_ Wetland_ NODs
Y:\17600\17652 BURL OAKS - COURSE RENOVATION PROJECT_ 07 Civil_ 01 CAD files_ 01 SHEETS\17652 C_ GRAD.dwg

MATCHLINE: C2

MATCHLINE: C4

MATCHLINE: C6

MATCHLINE: C9

LFE ~ 998.0

LFE ~ 997.0

LFE ~ 994.0

LFE ~ 998.0

LFE ~ 996.0

R 983.30

R 979.41

R 963.58

INV.=959.9

POND 6P
BOT: 950.00
NWL: 954.90
HWL: 956.64

FES-38
INV 954.90

FES-39
INV 954.90

FES-33
INV 974.50

FES-34
INV 974.00

FES-35
INV 969.00

FES-31
INV 976.20

FES-30
INV 976.00

FES-27
INV 974.00

FES-36
INV 968.60

FES-32
INV 976.50

BASIN 20P
NWL:974.50
HWL:978.84

FES-25
INV 975.40

FES-26
INV 975.00

FES-24
INV 975.70

1

18

6

7

N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- CONSTRUCTION LIMITS
- EXISTING CONTOUR
- PROPOSED CONTOUR
- DRAINAGE ARROW
- REDUNDANT SILT FENCE
- INLET SEDIMENT PROTECTION
- ROCK CONSTRUCTION ENTRANCE
- PROPOSED SPOT ELEVATION
- BITUMINOUS PATHWAY
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- COURSE FEATURE (GREEN, TEE, FAIRWAY)
- EXISTING STORM SEWER
- PROPOSED STORM SEWER

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GRADING, DRAINAGE & EROSION CONTROL PLAN

DRAWING NO.

C5

PLOTTED:	COMM. NO.
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Feb 21, 2025 - 12:38am AThiele
Xref Filename: \ 17652__s__base \ 17652 22x34 AE Commercial Title Block \ 4.30.24 +grading plan \ 17041__15783__S__BASE \ 17041 22x34 AE Commercial Title Block \ 13708_ BOGC_ Wetland_ NOD\
Y:\17600\17652 BURL OAKS - COURSE RENOVATION PROJECT__07 Civil__01 CAD files__01 SHEETS\17652 C_GRAD.dwg

MATCHLINE: C3

MATCHLINE: C5

MATCHLINE: C7

MATCHLINE: C10

POND 7P
BOT: 950.50
NWL: 954.90
HWL: 957.12
EOF 956.70

INSTALL & MAINTAIN
REDUNDANT SILT FENCE

INSTALL & MAINTAIN
REDUNDANT SILT FENCE

FES-10
INV 955.50

POND 11P
(NO GRADING)
NWL: 955.50
HWL: 956.59

INV.=955.3

INV.=955.4

TREE CLEARING ONLY
NO GRADING PROPOSED
WITHIN WETLAND

INSTALL &
MAINTAIN
REDUNDANT
SILT FENCE

FES-40
INV 956.30

FES-41
INV 956.40

POND 27P
BOT: 955.4
NWL: 956.3
HWL: 959.38

FES-42
INV 957.06

FES-45
INV 974.50

POND 8P
BOT: 953.50
NWL: 957.06
HWL: 959.46

INSTALL & MAINTAIN
REDUNDANT SILT FENCE

P2 P3 P4 P5 P6 P7 P8 P9

N
0 50' 100'

LEGEND

- PROPERTY LIMITS
- CONSTRUCTION LIMITS
- EXISTING CONTOUR
- PROPOSED CONTOUR
- DRAINAGE ARROW
- REDUNDANT SILT FENCE
- INLET SEDIMENT PROTECTION
- ROCK CONSTRUCTION ENTRANCE
- PROPOSED SPOT ELEVATION
- BITUMINOUS PATHWAY
- EXISTING WETLAND
- FLOODPLAIN BOUNDARY
- COURSE FEATURE (GREEN, TEE, FAIRWAY)
- EXISTING STORM SEWER
- PROPOSED STORM SEWER

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5400 N ARM DR
MINNETRISTA, MN 55364

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01/16/2025

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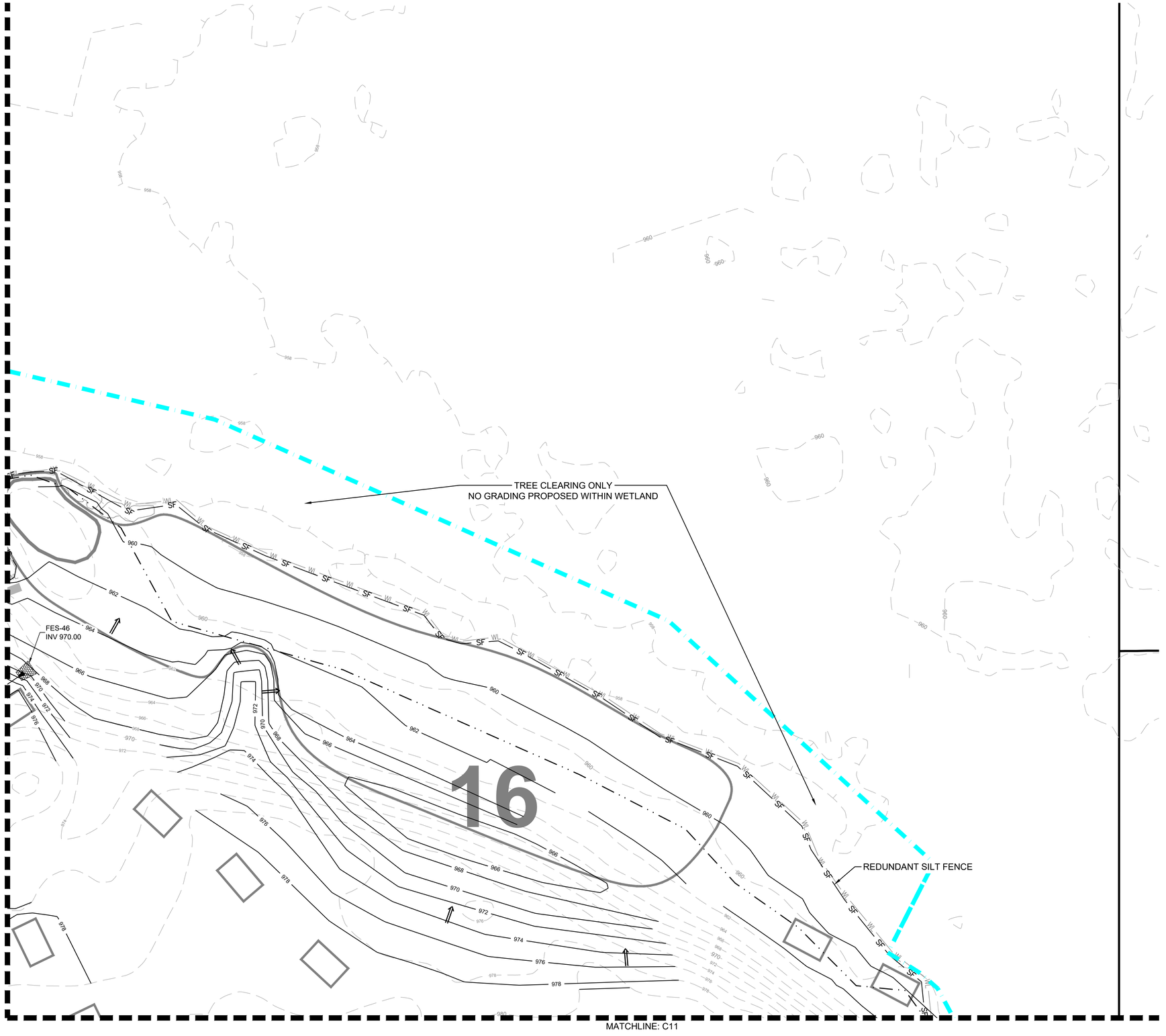
DRAWING TITLE

GRADING, DRAINAGE & EROSION CONTROL PLAN

DRAWING NO.

C6

PLOTTED:	COMM. NO.
----	17652



N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- CONSTRUCTION LIMITS
- 966 EXISTING CONTOUR
- 966 PROPOSED CONTOUR
- DRAINAGE ARROW
- SF REDUNDANT SILT FENCE
- INLET SEDIMENT PROTECTION
- ROCK CONSTRUCTION ENTRANCE
- ×800.1 PROPOSED SPOT ELEVATION
- BITUMINOUS PATHWAY
- WL EXISTING WETLAND
- FLOODPLAIN BOUNDARY
- COURSE FEATURE (GREEN, TEE, FAIRWAY)
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DRAWING TITLE

GRADING, DRAINAGE & EROSION CONTROL PLAN

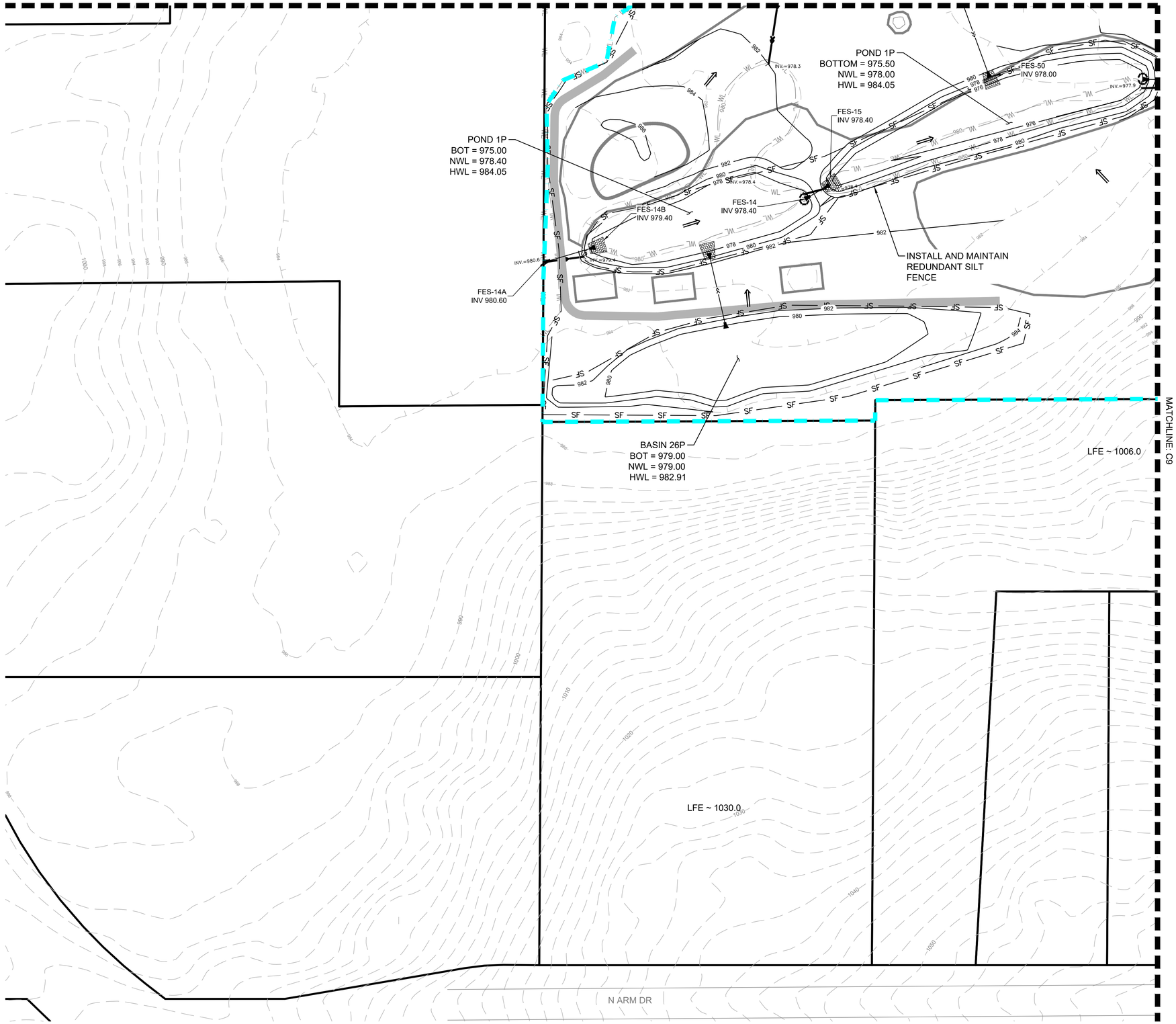
DRAWING NO.

C7

PLOTTED:	COMM. NO.
----	17652

Feb 21, 2025 - 12:38am AThiele
Y:\17600\17652 BURL OAKS - COURSE RENOVATION PROJECT_07 Civil_01 CAD files_01 SHEETS\17652 C_GRAD.dwg
Xref Filename: \ 17652_ s_ base \ 17652 22x34 AE Commercial Title Block \ 4.30.24 -g-grading plan \ 17041_ 15783_ S_ BASE \ 17041 22x34 AE Commercial Title Block \ 13708_ BOGC_ Wetland_ NOD\

MATCHLINE: C4



N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- CONSTRUCTION LIMITS
- EXISTING CONTOUR
- PROPOSED CONTOUR
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- REDUNDANT SILT FENCE
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DRAWING NO.

C8

PLOTTED:	COMM. NO.
----	17652

MATCHLINE: C5

MATCHLINE: C8

MATCHLINE: C10

9

BASIN 2P
BOT=977.6
NWL=977.6
HWL=985.47

FES-17
INV 977.70

INV=977.6

INV=979.6

INV.=982.7

EVENT LAWN

PUTTING GREEN

LFE=983.5

EXISTING CLUBHOUSE

MAIN TEE

LESSON TEE

SHOP

GAM

LFE ~ 992.0

LFE ~ 994.0

LFE ~ 1002.0

LFE ~ 1000.0

989.05
12RCP 4.80

974.76
15R 1.50%

976.98
15R 1.50%

INV.=972.8

N ARM DR

BITUMINOUS

GRAVEL

N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- CONSTRUCTION LIMITS
- EXISTING CONTOUR
- PROPOSED CONTOUR
- DRAINAGE ARROW
- REDUNDANT SILT FENCE
- INLET SEDIMENT PROTECTION
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DRAWING NO.

C9

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Feb 21, 2025 - 12:39am ATthiele
Xref Filename: \ 17652_ c_ base \ 17652 22x34 AE Commercial Title Block \ 4.30.24 -grading plan \ 17041_ 15783_ S_ BASE \ 17041 22x34 AE Commercial Title Block \ 13709_ BOGC_ Wetland_ NOD\
Y:\17600\17652 BURL OAKS - COURSE RENOVATION PROJECT_ 07 Civil_ 01 CAD files_ 01 SHEETS\17652 C_ GRAD.dwg

MATCHLINE: C6

MATCHLINE: C9

MATCHLINE: C11

NORMAL OUTLET
EOF = 962.0

FES-43
INV 957.20

EOF = 959.70

FES-44
INV 958.40

POND 9P
BOT = 950.50
NWL = 958.40
HWL = 960.38

INSTALL &
MAINTAIN
REDUNDANT
SILT FENCE

10

POND 10P
NWL=975.30
HWL=975.60

13

FILTRATION BASIN 24INF
BOTTOM = 961.20
NWL = 962.0
HWL = 962.27
SEE 1/C14

FES-47
INV 966.00

FES-48
INV 968.10

EAST
TEE

FILTRATION BASIN 15INF
BOTTOM = 965.50
NWL = 966.50
HWL = 967.13
SEE 1/C14

RIPRAP WEIR
NORMAL OUTLET 966.50

TOP OF BERM
EOF 967.0

INV.=963.7

INV.=964.2

INSTALL & MAINTAIN
REDUNDANT SILT FENCE

SHORT
GAME

EXISTING
MAINTENANCE
BUILDING

POND 15P
NWL=962.40
HWL=966.35

ROCK CONSTRUCTION
ENTRANCE

INV.=962.4

N ARM DR

N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- CONSTRUCTION LIMITS
- EXISTING CONTOUR
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- DRAINAGE ARROW
- REDUNDANT SILT FENCE
- INLET SEDIMENT PROTECTION
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DRAWING NO.

C10

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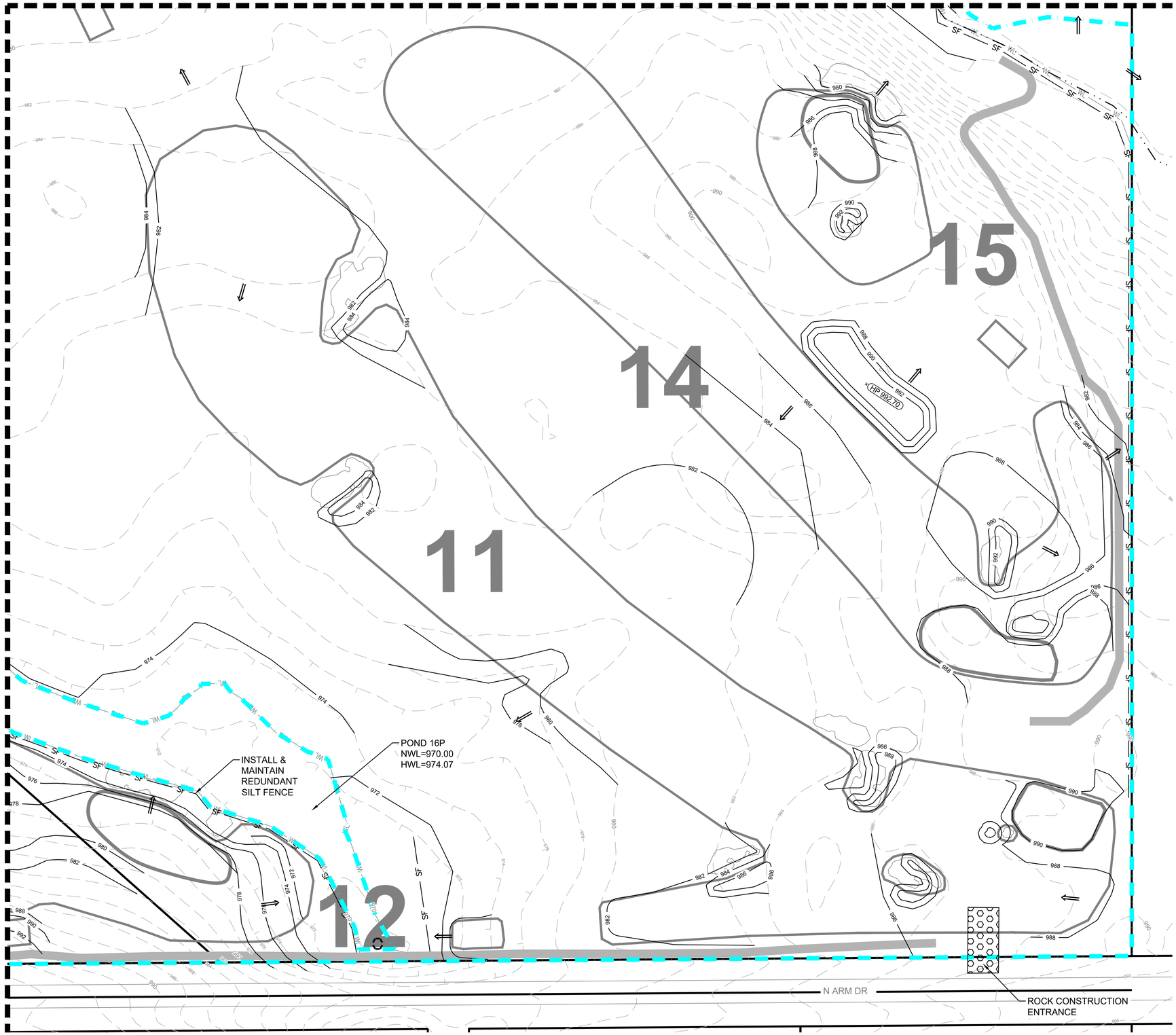
Y:\17600\17652 BURL OAKS - COURSE RENOVATION PROJECT__07 Civil__01 CAD files__01 SHEETS\17652 C__GRAD.dwg

MATCHLINE: C7

MATCHLINE: C10



N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- CONSTRUCTION LIMITS
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- PROPOSED CONTOUR
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GRADING, DRAINAGE & EROSION CONTROL PLAN

DRAWING NO.

C11

PLOTTED:	COMM. NO.
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Feb 21, 2025 - 12:39am AThiele
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STORM WATER POLLUTION PREVENTION PLAN NARRATIVE - PAGE 1 OF 2

PROJECT DESCRIPTION/LOCATION

BURL OAKS GOLF CLUB IS LOCATED IN THE CITY OF MINNETRISTA IN HENNEPIN COUNTY. THE PROPERTY IS LOCATED IN MINNEHAHA CREEK WATERSHED DISTRICT. THE SITE ENCOMPASSES 198.82 ACRES.

THE PLANNED SCOPE OF THE PROJECT INCLUDES:

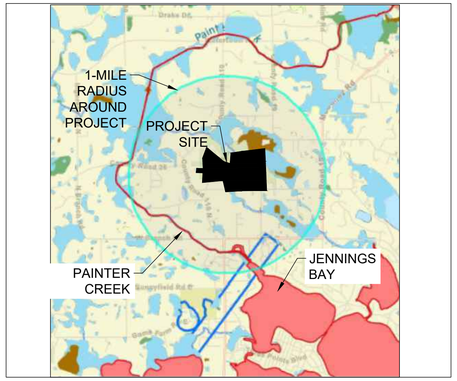
- THE INSTALLATION OF EROSION CONTROL MEASURES AS REQUIRED FOR THE MASS GRADING OF THE SITE FOR THE CONSTRUCTION OF GOLF COURSE FEATURES.
- GRADING AS REQUIRED FOR THE INSTALLATION OF GOLF COURSE FEATURES.
- INSTALLATION OF STORM SEWER.
- RECONSTRUCTION OF BITUMINOUS CART PATHS.

RECEIVING WATERS

THESE WATERS ARE LOCATED WITHIN ONE MILE (AERIAL RADIUS) OF THE PROJECT LIMITS AND RECEIVE RUNOFF FROM THE PROJECT SITE. DUE TO THE PROXIMITY OF THE RECEIVING WATERS, THE BMPS DESCRIBED IN APPENDIX A OF THE NPDES PERMIT MAY APPLY TO ALL AREAS OF THE SITE.

SITES THAT DISCHARGE NEAR WATERS WITH QUALITIES THAT WARRANT EXTRA PROTECTION (SPECIAL WATERS) MUST USE ADDITIONAL BEST MANAGEMENT PRACTICES AND ENHANCED RUNOFF CONTROLS.

SITES WITHIN ONE MILE (AERIAL RADIUS MEASUREMENT) OF AND THAT DISCHARGE TO A WATER IMPAIRED FOR PHOSPHORUS, TURBIDITY, DISSOLVED OXYGEN, AND BIOTIC IMPAIRMENT, MUST MEET SPECIAL CONDITIONS (APPENDIX A, SECTION B.10). THERE ARE NO ADDITIONAL REQUIREMENTS FOR WATERS IMPAIRED FOR OTHER POLLUTANTS.



WATERS WITHIN 1 MILE RADIUS					
NAME OF WATER BODY	TYPE (LAKE, RIVER, WETLAND, DITCH, ETC)	APPENDIX A SPECIAL WATER (YES OR NO)	IMPAIRED WATER WITHIN 1 MILE OF PROJECT SITE (YES OR NO)	APPROVED TMDL	RECEIVING WATERS (YES OR NO)
JENNINGS BAY	LAKE	YES	YES	YES	YES
PAINTER CREEK	CREEK	YES	YES	YES	YES

DUE TO THE PROXIMITY OF JENNINGS BAY AND PAINTER CREEK, THE FOLLOWING WILL BE IMPLEMENTED ACCORDING TO THE MPCA REQUIREMENTS FOR DISCHARGING INTO IMPAIRED WATERS:

1. PERMITTEES MUST IMMEDIATELY INITIATE STABILIZATION OF EXPOSED SOIL AREAS, AS DESCRIBED IN ITEM 8.4, AND COMPLETE THE STABILIZATION WITHIN SEVEN (7) CALENDAR DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE TEMPORARILY OR PERMANENTLY CEASES.
2. PERMITTEES MUST PROVIDE A TEMPORARY SEDIMENT BASIN AS DESCRIBED IN SECTION 14 FOR COMMON DRAINAGE LOCATIONS THAT SERVE AN AREA WITH FIVE (5) OR MORE ACRES DISTURBED AT ONE TIME.
3. ALSO, A MANDATORY STORMWATER POLLUTION PREVENTION PLAN (SWPPP) REVIEW IS REQUIRED BY THE MPCA IF THE PROJECT WILL DISTURB OVER 50 ACRES AND HAS A DISCHARGE POINT ON THE PROJECT WITHIN 1 MILE (AERIAL RADIUS MEASUREMENT) OF, AND FLOWS TO THE IMPAIRED WATER. OWNERS MUST SUBMIT THE APPLICATION FOR COVERAGE AND THE STORM WATER POLLUTION PREVENTION PLAN AT LEAST 30-DAYS BEFORE THE CONSTRUCTION START DATE. THE SWPPP CAN BE ATTACHED ELECTRONICALLY WHEN USING THE ONLINE APPLICATION.
4. PERMITTEES MUST IMMEDIATELY INITIATE STABILIZATION OF EXPOSED SOIL AREAS, AS DESCRIBED IN ITEM 8.4, AND COMPLETE THE STABILIZATION WITHIN SEVEN (7) CALENDAR DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE TEMPORARILY OR PERMANENTLY CEASES.
5. PERMITTEES MUST PROVIDE A TEMPORARY SEDIMENT BASIN AS DESCRIBED IN SECTION 14 FOR COMMON DRAINAGE LOCATIONS THAT SERVE AN AREA WITH FIVE (5) OR MORE ACRES DISTURBED AT ONE TIME.
6. ALSO, A MANDATORY STORMWATER POLLUTION PREVENTION PLAN (SWPPP) REVIEW IS REQUIRED BY THE MPCA IF THE PROJECT WILL DISTURB OVER 50 ACRES AND HAS A DISCHARGE POINT ON THE PROJECT WITHIN 1 MILE (AERIAL RADIUS MEASUREMENT) OF, AND FLOWS TO THE IMPAIRED WATER. OWNERS MUST SUBMIT THE APPLICATION FOR COVERAGE AND THE SWPPP AT LEAST 30-DAYS BEFORE THE CONSTRUCTION START DATE. THE SWPPP CAN BE ATTACHED ELECTRONICALLY WHEN USING THE ONLINE APPLICATION.

SOIL TYPES

SOIL TYPES TYPICALLY FOUND IN THE PROJECT AREA CONSIST OF MUSKEGO AND HOUGHTON, LESTER-KILKENNY COMPLEX AND ANGUS-KILKENNY COMPLEX, MAKING UP 65% OF ONSITE SOILS, PER SOIL REPORT TAKEN FROM WEBSOILSURVEY.NRCS.USDA.GOV.

PROJECT PERSONNEL AND TRAINING

THIS SWPPP WAS PREPARED BY PERSONNEL THAT ARE CERTIFIED IN THE DESIGN OF CONSTRUCTION SWPPP. COPIES OF THE CERTIFICATIONS ARE ON FILE WITH THE ENGINEER.

PROVIDE A CERTIFIED EROSION CONTROL SUPERVISOR IN GOOD STANDING WHO IS KNOWLEDGEABLE AND EXPERIENCED IN THE APPLICATION OF EROSION PREVENTION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES. THE EROSION CONTROL SUPERVISOR WILL WORK WITH THE PROJECT ENGINEER / SWPPP DESIGNER TO OVERSEE THE IMPLEMENTATION OF THE SWPPP AND THE INSTALLATION, INSPECTION, AND MAINTENANCE OF THE EROSION PREVENTION AND SEDIMENT CONTROL BMPS BEFORE, DURING, AND AFTER CONSTRUCTION UNTIL THE NOTICE OF TERMINATION (NOT) HAS BEEN FILED WITH THE MPCA. PROVIDE PROOF OF CERTIFICATION AT THE PRECONSTRUCTION MEETING. WORK WILL NOT BE ALLOWED TO COMMENCE UNTIL PROOF OF CERTIFICATION HAS BEEN PROVIDED TO THE PROJECT ENGINEER.

PROVIDE AT LEAST ONE CERTIFIED INSTALLER FOR EACH CONTRACTOR OR SUBCONTRACTOR THAT INSTALLS THE PRODUCTS LISTED IN SPECIFICATION SECTION 2573.3.A.2 CERTIFIED INSTALLERS. PROVIDE PROOF OF CERTIFICATION AT THE PRECONSTRUCTION MEETING. WORK WILL NOT BE ALLOWED TO COMMENCE UNTIL PROOF OF CERTIFICATION HAS BEEN PROVIDED TO THE PROJECT ENGINEER.

CHAIN OF RESPONSIBILITY

THE OWNER AND CONTRACTOR ARE CO-PERMITTEES FOR THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) CONSTRUCTION PERMIT. THE CONTRACTOR IS RESPONSIBLE TO COMPLY WITH ALL ASPECTS OF THE NPDES CONSTRUCTION PERMIT AT ALL TIMES UNTIL THE NOTICE OF TERMINATION (NOT) HAS BEEN FILED WITH THE MPCA THE CONTRACTOR WILL DEVELOP A CHAIN OF COMMAND WITH ALL OPERATORS ON THE SITE TO ENSURE THAT THE SWPPP WILL BE IMPLEMENTED AND STAY IN EFFECT UNTIL THE CONSTRUCTION PROJECT IS COMPLETE, THE ENTIRE SITE HAS UNDERGONE FINAL STABILIZATION, AND A NOTICE OF TERMINATION (NOT) HAS BEEN SUBMITTED TO THE MPCA.

PROJECT CONTACTS

THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTATION OF THE SWPPP AND INSTALLATION, INSPECTION, AND MAINTENANCE OF THE EROSION PREVENTION AND SEDIMENT CONTROL BMPS BEFORE, DURING, AND AFTER CONSTRUCTION UNTIL THE NOTICE OF TERMINATION (NOT) HAS BEEN FILED.

CONTACT INFORMATION		
ORGANIZATION	CONTACT NAME	PHONE
BURL OAKS GOLF CLUB	NATHAN PETERS	952-472-7017
ANDERSON ENGINEERING (SWPPP DESIGN)	JACOB DOBIAS*	763-412-4000
[CONTRACTOR]		

*CERTIFIED FOR DESIGN OF CONSTRUCTION SWPPP BY UNIVERSITY OF MINNESOTA, EXPIRES 5/31/26

MPCA DUTY OFFICER 24 HOUR EMERGENCY NOTIFICATION:
651-649-5451 OR 800-422-0798

SITE INSPECTION AND MAINTENANCE

CONTRACTOR SHALL PROVIDE NAME, CONTACT INFO, AND TRAINING DOCUMENTATION FOR THE PERSON RESPONSIBLE FOR SWPPP IMPLEMENTATION AND INSPECTION/MAINTENANCE OF BMPS.

INSPECT THE ENTIRE CONSTRUCTION SITE A MINIMUM OF ONCE EVERY SEVEN DAYS DURING ACTIVE CONSTRUCTION AND WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES WITHIN A 24 HOUR TIME FRAME. INSPECT ALL TEMPORARY AND PERMANENT WATER QUALITY MANAGEMENT, EROSION PREVENTION AND SEDIMENT CONTROL BMPS UNTIL THE SITE HAS UNDERGONE FINAL STABILIZATION AND THE N.O.T. HAS BEEN SUBMITTED. INSPECT SURFACE WATER INCLUDING DRAINAGE DITCHES FOR SIGNS OF EROSION AND SEDIMENT DEPOSITION. INSPECT CONSTRUCTION SITE VEHICLE EXIT LOCATIONS FOR EVIDENCE OF TRACKING ONTO PAVED SURFACES. INSPECT SURROUNDING PROPERTIES FOR EVIDENCE OF OFF SITE SEDIMENT ACCUMULATION.

RECORD ALL INSPECTIONS AND MAINTENANCE ACTIVITIES IN WRITING WITHIN 24 HOURS. SUBMIT INSPECTION REPORTS IN A FORMAT THAT IS ACCEPTABLE TO THE PROJECT ENGINEER.

FOR PROJECTS THAT DISCHARGE TO PROHIBITED WATERS, CONDUCT ROUTINE SITE INSPECTIONS AT A MINIMUM OF ONCE EVERY 72 HOURS (3 DAYS).

INCLUDE THE FOLLOWING IN THE RECORDS OF EACH INSPECTION AND MAINTENANCE ACTIVITY:

A. DATE AND TIME OF INSPECTIONS
B. NAME OF PERSONS CONDUCTING INSPECTIONS
C. FINDINGS OF INSPECTIONS, INCLUDING RECOMMENDATIONS FOR CORRECTIVE ACTIONS
D. CORRECTIVE ACTION TAKEN, INCLUDING DATES, TIMES, AND PARTY COMPLETING MAINTENANCE ACTIVITIES
E. DATE AND AMOUNT OF ALL RAINFALL EVENTS GREATER THAN 0.5 INCH IN 24 HOURS
F. DOCUMENTS AND CHANGES MADE TO THE SWPPP

REPLACE, REPAIR OR SUPPLEMENT ALL NONFUNCTIONAL BMPS IN THE TIME PROVIDED BELOW:

A. REPAIR, REPLACE, OR SUPPLEMENT PERIMETER CONTROL DEVICES WHEN IT BECOMES NONFUNCTIONAL OR SEDIMENT REACHES ½ THE HEIGHT OF THE DEVICE. COMPLETE REPAIRS BY THE END OF THE NEXT BUSINESS DAY FOLLOWING DISCOVERY.
B. REPAIR OR REPLACE INLET PROTECTION DEVICES WHEN THEY BECOME NONFUNCTIONAL OR SEDIMENT REACHES ½ THE HEIGHT AND/OR DEPTH OF THE DEVICE. COMPLETE REPAIRS BY THE END OF THE NEXT BUSINESS DAY FOLLOWING DISCOVERY.
C. DRAIN AND REMOVE SEDIMENT FROM TEMPORARY AND PERMANENT SEDIMENT BASINS ONCE THE SEDIMENT HAS REACHED ½ THE STORAGE VOLUME. COMPLETE WORK WITHIN 72 HOURS OF DISCOVERY.
D. REMOVE ALL DELTAS AND SEDIMENT DEPOSITED IN SURFACE WATER INCLUDING DRAINAGE WAYS, CATCH BASINS, AND OTHER DRAINAGE SYSTEMS. RESTABILIZE ANY AREAS THAT ARE DISTURBED BY SEDIMENT REMOVAL OPERATION. SEDIMENT REMOVAL AND STABILIZATION MUST BE COMPLETED WITHIN 7 DAYS OF DISCOVERY. PREPARE AND SUBMIT A SITE MANAGEMENT PLAN FOR WORKING IN SURFACE WATERS.
E. REMOVE TRACKED SEDIMENT FROM PAVED SURFACES BOTH ON AND OFF SITE WITHIN 24 HOURS OF DISCOVERY. STREET SWEEPING MAY HAVE TO OCCUR MORE OFTEN TO MINIMIZE OFF SITE IMPACTS. LIGHTLY WET THE PAVEMENT PRIOR TO SWEEPING.
F. MAINTAIN ALL BMPS UNTIL WORK HAS BEEN COMPLETED, SITE HAS GONE UNDER FINAL STABILIZATION, AND THE NOTICE OF TERMINATION (NOT) HAS BEEN SUBMITTED TO THE MPCA.

AREA SUMMARY

ACREAGE SUMMARY	
AREA	ACRES
PROPERTY	198.82
DISTURBED	74.26
RECONSTRUCTED IMPERVIOUS	1.43
NEW IMPERVIOUS	0

SPECIAL SITE NOTES

HYDROLOGIC MODELING DATA IS AVAILABLE UPON REQUEST.

THE SWPPP COORDINATOR MUST BE AVAILABLE FOR AN ONSITE INSPECTION WITHIN 72 HOURS UPON REQUEST BY THE MPCA AND SHALL BE RESPONSIBLE FOR THE FOLLOWING:

- SUBMIT THE NPDES PERMIT APPLICATION AND COMPLY WITH ALL REQUIREMENTS.
- IMPLEMENT THE SWPPP.
- OVERSEE INSTALLATION AND MAINTENANCE PRACTICES AND REPAIRS IDENTIFIED IN THE SWPPP.
- IMPLEMENT AND OVERSEE EMPLOYEE TRAINING AND RECORD IN OR WITH THE SWPPP.
- CONDUCT OR PROVIDE FOR INSPECTION AND MONITORING ACTIVITIES AND MAINTAIN LOGS AS PERMIT REQUIRES.
- IDENTIFY OTHER POTENTIAL POLLUTANT SOURCES NOT LISTED IN THE SWPPP AND ADD THEM.
- IDENTIFY ANY DEFICIENCIES IN THE SWPPP AND CORRECT THEM.
- ENSURE THAT CHANGES TO CONSTRUCTION PLANS ARE ADDRESSED IN THE SWPPP.
- FILE THE NOTICE OF TERMINATION UPON PROJECT COMPLETION.

AFTER THE NOTICE OF TERMINATION HAS BEEN FILED, THE OWNER SHALL BE RESPONSIBLE FOR ASSIGNING RESPONSIBILITY FOR PERMANENT MAINTENANCE MEASURES.

PERMITS

THE FOLLOWING PERMITS APPLY TO THIS PROJECT:

AGENCY	TYPE OF PERMIT	PERMIT # AND DATES
MINNESOTA POLLUTION CONTROL AGENCY (MPCA)	NPDES CONSTRUCTION PERMIT	
CITY OF MINNETRISTA	GRADING PERMIT	

LOCATION OF SWPPP REQUIREMENTS

THE REQUIRED SWPPP ELEMENTS MAY BE LOCATED IN MANY PLACES WITHIN THE PLAN SET.

SWPPP AMENDMENTS

A QUALIFIED INDIVIDUAL MUST COMPLETE ALL SWPPP CHANGES. CHANGES INVOLVING THE USE OF A LESS STRINGENT BMP MUST INCLUDE A JUSTIFICATION DESCRIBING HOW THE REPLACEMENT BMP IS EFFECTIVE FOR THE SITE CHARACTERISTICS.

PERMITTEES MUST AMEND THE SWPPP TO INCLUDE ADDITIONAL OR MODIFIED BMPS AS NECESSARY TO CORRECT PROBLEMS IDENTIFIED OR ADDRESS SITUATIONS WHENEVER THERE IS A CHANGE IN DESIGN, CONSTRUCTION OPERATION, MAINTENANCE, WEATHER, OR SEASONAL CONDITIONS HAVING A SIGNIFICANT EFFECT ON THE DISCHARGE OF POLLUTANTS TO SURFACE WATERS OR GROUNDWATER.

PERMITTEES MUST AMEND THE SWPPP TO INCLUDE ADDITIONAL OR MODIFIED BMPS AS NECESSARY TO CORRECT PROBLEMS IDENTIFIED OR ADDRESS SITUATIONS WHENEVER INSPECTIONS OR INVESTIGATIONS BY THE SITE OWNER OR OPERATOR, USEPA OR MPCA OFFICIALS INDICATE THE SWPPP IS NOT EFFECTIVE IN ELIMINATING OR SIGNIFICANTLY MINIMIZING THE DISCHARGE OF POLLUTANTS TO SURFACE WATERS OR GROUNDWATER OR THE DISCHARGES ARE CAUSING WATER QUALITY STANDARD EXCEEDANCES OR THE SWPPP IS NOT CONSISTENT WITH THE OBJECTIVES OF A USEPA APPROVED TMDL.

ANDERSON
13605 1st Avenue N. #100
Plymouth, MN 55441 | ae-mn.com
P 763.412.4000 | F 763.412.4090
Anderson Engineering of Minnesota, LLC

BURL OAKS - COURSE RENOVATION PROJECT

5400 N ARM DR
MINNETRISTA, MN 55364

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

PRINT NAME: ADAM THIELE, PE
SIGNATURE: NOT FOR CONSTRUCTION
DATE: 01/16/2025 LICENSE NO. 51317

REVISION LOG

NO.	DATE	DESCRIPTION OF REVISIONS
1	02/09/25	REVISED PER MCWD COMMENT
2	02/18/25	REVISED WETLAND RESTORATION

MCWD PERMIT APPLICATION
01/16/2025

DESIGNED:	DRAWN:	CHECKED BY:
AT	JR	AT

DRAWING TITLE

SWPPP - PG 1

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STORM WATER POLLUTION PREVENTION PLAN NARRATIVE - PAGE 2 OR 2

STABILIZATION TIME FRAMES

ALL AREAS DISTURBED BY CONSTRUCTION WILL RECEIVE SEED OR SOD ACCORDING TO THE PLANS AND SPECIFICATIONS AND WITHIN THE SPECIFIED VEGETATIVE TIME SCHEDULE. FINAL STABILIZATION WILL OCCUR WHEN THE SITE HAS A UNIFORM VEGETATIVE COVER WITH A DENSITY OF 70% OVER THE ENTIRE DISTURBED AREA COMPARED TO EXISTING CONDITIONS. ALL TEMPORARY SYNTHETIC EROSION PREVENTION AND SEDIMENT CONTROL BMPS MUST BE REMOVED AS PART OF THE SITE FINAL STABILIZATION. ALL SEDIMENT MUST BE CLEANED OUT OF CONVEYANCES AND TEMPORARY SEDIMENTATION BASINS IF APPLICABLE.

AREA	TIME FRAME	NOTES
LAST 200 LINEAL FEET OF DRAINAGE DITCH OR SWALE	WITHIN 24 HOURS OF CONNECTION TO SURFACE WATER OR PROPERTY EDGE	1, 2, 3
REMAINING PORTIONS OF DRAINAGE DITCH OR SWALE	7 DAYS	1, 3
PIPE AND CULVERT OUTLETS	24 HOURS	
STOCKPILES	7 DAYS	1

1. INITIATE INLET STABILIZATION IMMEDIATELY WHEN CONSTRUCTION HAS TEMPORARILY OR PERMANENTLY CEASED ON ANY PORTION OF THE SITE. COMPLETE STABILIZATION WITHIN THE TIME FRAME LISTED. IN MANY INSTANCES THIS WILL REQUIRE STABILIZATION TO OCCUR MORE THAN ONCE DURING THE COURSE OF THE PROJECT. TEMPORARY SOIL STOCKPILES WITHOUT SIGNIFICANT CLAY OR SILT AND STOCKPILED AND CONSTRUCTED ROAD BASE ARE NOT APPROPRIATE AND THEREFORE EXEMPT FROM THE STABILIZATION REQUIREMENT.

2. APPLICATION OF MULCH, HYDROMULCH, TACKIFIER AND POLYACRYLAMIDE ARE NOT ACCEPTABLE STABILIZATION METHODS IN THESE AREAS.

3. STABILIZE ALL AREAS OF THE SITE PRIOR TO THE ONSET OF WINTER, ANY WORK STILL BEING PERFORMED WILL BE SNOW MULCHED, SEEDED, AND BLANKETED WITHIN THE TIME FRAMES IN THE NPDES PERMIT.

4. TOPSOIL BERMS MUST BE STABILIZED IN ORDER TO BE CONSIDERED PERIMETER CONTROL BMPS. USE RAPID STABILIZATION METHOD 2, 3, OR 4 AS DIRECTED BY THE ENGINEER. THE SEED MIX USED IN THE RAPID STABILIZATION MAY BE SUBSTITUTED AS FOLLOWS:

   A. SINGLE YEAR CONSTRUCTION BETWEEN MAY 1 - AUGUST 1, SEED WITH SEED MIXTURE 21.111
   B. SINGLE YEAR CONSTRUCTION BETWEEN AUGUST 1 AND OCTOBER 31, SEED WITH SEED MIXTURE 21-112
   C. MULTI YEAR CONSTRUCTION 22-111

5. KEEP DITCHES AND EXPOSED SOILS IN AN EVEN ROUGH GRADED CONDITION IN ORDER TO BE ABLE TO APPLY EROSION CONTROL MULCHES, HYDROMULCHES AND BLANKETS.

GENERAL SWPPP NOTES FOR CONSTRUCTION ACTIVITY

1. CONTRACTOR SHALL AMEND THE SWPPP AND DOCUMENT ANY AND ALL CHANGES TO THE SWPPP AND ASSOCIATED PLAN SHEETS WITHIN 7 DAYS UPON IMPLEMENTATION. STORE THE SWPPP AND ALL AMENDMENTS ON SITE AT ALL TIMES.
2. PREPARE AND SUBMIT A SITE MANAGEMENT PLAN FOR THE ENGINEER'S ACCEPTANCE FOR CONCRETE MANAGEMENT, CONCRETE SLURRY APPLICATION AREAS, WORK IN AND NEAR AREAS OF ENVIRONMENTAL SENSITIVITY, AREAS IDENTIFIED IN THE PLANS AS "SITE MANAGEMENT PLAN AREA", ANY WORK THAT WILL REQUIRE DEWATERING, AND AS REQUESTED BY THE ENGINEER. SUBMIT ALL SITE MANAGEMENT PLANS TO THE ENGINEER IN WRITING. ALLOW A MINIMUM OF 7 DAYS FOR THE ENGINEER TO REVIEW AND ACCEPT SITE MANAGEMENT PLAN SUBMITTALS. WORK WILL NOT BE ALLOWED TO COMMENCE IF A SITE MANAGEMENT PLAN IS REQUIRED UNTIL ACCEPTANCE HAS BEEN GRANTED BY THE ENGINEER. THERE WILL BE NO EXTRA TIME ADDED TO THE CONTRACT DUE TO THE UNTIMELY SUBMITTAL.
3. IT IS THE DESIGNER'S INTENT THAT THE CONTRACTOR BUILD PONDS AND INSTALL EROSION CONTROL BMPS BEFORE PUTTING THEM INTO ACTIVE SERVICE TO THE MAXIMUM EXTENT PRACTICABLE.
4. BURNING OF ANY MATERIAL IS NOT ALLOWED WITHIN PROJECT BOUNDARY.
5. DO NOT DISTURB AREAS OUTSIDE OF THE CONSTRUCTION LIMITS. DELINEATE AREAS NOT TO BE DISTURBED PRIOR TO STARTING GROUND DISTURBING ACTIVITIES. IF IT BECOMES NECESSARY TO DISTURB AREAS OUTSIDE OF THE CONSTRUCTION LIMITS, OBTAIN WRITTEN PERMISSION FROM THE PROJECT ENGINEER PRIOR TO PROCEEDING. PRESERVE ALL NATURAL BUFFERS SHOWN ON THE PLANS.
6. ROUTE STORMWATER AROUND UNSTABILIZED AREAS OF THE SITE WHENEVER FEASIBLE. PROVIDE EROSION CONTROL AND VELOCITY DISSIPATION DEVICES AS NEEDED TO KEEP CHANNELS FROM ERODING AND TO PREVENT NUISANCE CONDITIONS AT THE OUTLET.
7. DIRECT DISCHARGES FROM BMPS TO VEGETATED AREA WHENEVER FEASIBLE. PROVIDE VELOCITY DISSIPATION DEVICES AS NEEDED TO PREVENT EROSION.
8. THE EROSION PREVENTION AND SEDIMENT CONTROL BMPS SHALL BE PLACED AS NECESSARY TO MINIMIZE EROSION FROM DISTURBED SURFACES AND TO CAPTURE SEDIMENT ON SITE. ALL EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO COMMENCEMENT OF ANY REMOVAL WORK AND/OR GROUND DISTURBING ACTIVITIES COMMENCE.
9. ESTABLISH SEDIMENT CONTROL DEVICES ON ALL DOWN GRADIENT PERIMETERS AND UP GRADIENT OF ANY BUFFER ZONES BEFORE UP GRADIENT LAND DISTURBING ACTIVITIES BEGIN. MAINTAIN SEDIMENT CONTROL DEVICES UNTIL CONSTRUCTION IS COMPLETE AND THE SITE IS STABILIZED.
10. LOCATE PERIMETER CONTROL ON THE CONTOUR TO CAPTURE OVERLAND, LOW-VELOCITY SHEET FLOWS DOWN GRADIENT OF ALL EXPOSED SOILS AND PRIOR TO DISCHARGING TO SURFACE WATERS. PLACE J-HOOKS AT A MAXIMUM OF 100 FOOT INTERVALS.
11. PROVIDE PERIMETER CONTROL AROUND ALL STOCKPILES. PLACE BMP A MINIMUM 5 FEET FROM THE TOE OF SLOPE WHERE FEASIBLE. DO NOT PLACE STOCKPILES IN NATURAL BUFFER AREAS, SURFACE WATERS OR STORMWATER CONVEYANCES.
12. FLOATING SILT CURTAIN IS ALLOWED AS PERIMETER CONTROL FOR IN WATER WORK ONLY. INSTALL THE FLOATING SILT CURTAIN AS CLOSE TO SHORE AS POSSIBLE. PLACE PERIMETER CONTROL BMP ON LAND IMMEDIATELY AFTER THE IN WATER WORK IS COMPLETED.
13. DITCH CHECKS WILL BE PLACED AS INDICATED ON THE PLANS DURING ALL PHASES OF CONSTRUCTION.
14. PLACE CONSTRUCTION EXITS, AS NECESSARY, TO PREVENT TRACKING OF SEDIMENT ONTO PAVED SURFACES BOTH ON AND OFF THE PROJECT SITE. PROVIDE CONSTRUCTION EXITS OF SUFFICIENT SIZE TO PREVENT TRACK OUT. MAINTAIN CONSTRUCTION EXITS WHEN EVIDENCE OF TRACKING IS DISCOVERED. REGULAR STREET SWEEPING IS NOT AN ACCEPTABLE ALTERNATIVE TO PROPER CONSTRUCTION EXIT INSTALLATION AND MAINTENANCE. CONSTRUCTION EXITS ARE INCIDENTAL.
15. DISCHARGE TURBID OR SEDIMENT LADEN WATER TO TEMPORARY SEDIMENT BASINS WHENEVER FEASIBLE. IN THE EVENT THAT IT IS NOT FEASIBLE TO DISCHARGE THE SEDIMENT LADEN WATER TO A TEMPORARY SEDIMENT BASIN, THE WATER MUST BE TREATED SO THAT IT DOES NOT CAUSE A NUISANCE CONDITION IN THE RECEIVING WATERS OR TO DOWNSTREAM LANDOWNERS. CLEAN OUT ALL PERMANENT STORMWATER BASINS REGARDLESS OF WHETHER USED AS TEMPORARY SEDIMENT BASINS OR TEMPORARY SEDIMENT TRAPS TO THE DESIGN CAPACITY AFTER ALL UP GRADIENT LAND DISTURBING ACTIVITY IS COMPLETED.
16. PROVIDE SCOUR PROTECTION AT ANY OUTFALL OF DEWATERING ACTIVITIES.
17. PROVIDE STABILIZATION IN ANY TRENCHES CUT FOR DEWATERING OR SITE DRAINING PURPOSES.

POLLUTION PREVENTION

1. PROVIDE A SPILL KIT AT EACH WORK LOCATION ON THE SITE.
2. STORE ALL BUILDING MATERIALS THAT HAVE THE POTENTIAL TO LEACH POLLUTANTS, PESTICIDES, HERBICIDES, INSECTICIDES, FERTILIZERS, TREATMENT CHEMICALS, AND LANDSCAPE MATERIALS UNDER COVER WITH SECONDARY CONTAINMENT.
3. PROVIDE A SECURE STORAGE AREA WITH RESTRICTED ACCESS FOR ALL HAZARDOUS MATERIALS AND TOXIC WASTE. RETURN ALL HAZARDOUS MATERIALS AND TOXIC WASTE TO THE DESIGNATED STORAGE AREA AT THE END OF THE BUSINESS DAY UNLESS INFEASIBLE. STORE ALL HAZARDOUS MATERIALS AND TOXIC WASTE (INCLUDING BUT NOT LIMITED TO OIL, DIESEL FUEL, GASOLINE, HYDRAULIC FLUIDS, PAINT, PETROLEUM BASED PRODUCTS, WOOD PRESERVATIVES, ADDITIVES, CURING COMPOUNDS, AND ACIDS) IN SEALED CONTAINERS WITH SECONDARY CONTAINMENT. CLEAN UP SPILLS IMMEDIATELY.
4. STORE, COLLECT AND DISPOSE OF ALL SOLID WASTE.
5. POSITION ALL PORTABLE TOILETS SO THAT THEY ARE SECURE AND CANNOT BE TIPPED OR KNOCKED OVER. PROPERLY DISPOSE OF ALL SANITARY WASTE.
6. FUEL AND MAINTAIN VEHICLES IN A DESIGNATED CONTAINED AREA WHENEVER FEASIBLE. USE DRIP PANS OR ABSORBENT MATERIALS TO PREVENT SPILLS OR LEAKED CHEMICALS FROM DISCHARGING TO SURFACE WATER OR STORMWATER CONVEYANCES. PROVIDE A SPILL KIT AT EACH LOCATION THAT VEHICLES AND EQUIPMENT ARE FUELED OR MAINTAINED AT.
7. LIMIT VEHICLE AND EQUIPMENT WASHING TO A DEFINED AREA OF THE SITE. CONTAIN RUNOFF FROM THE WASHING AREA TO A TEMPORARY SEDIMENT BASIN OR OTHER EFFECTIVE CONTROL. PROPERLY DISPOSE OF ALL WASTE GENERATED BY VEHICLE AND EQUIPMENT WASHING. ENGINE DEGREASING IS NOT ALLOWED ON THE SITE.
8. PROVIDE EFFECTIVE CONTAINMENT FOR ALL LIQUID AND SOLID WASTES GENERATED BY WASHOUT OF CONCRETE, STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS AND OTHER CONSTRUCTION MATERIALS. LIQUID AND SOLID WASHOUT WASTES MUST NOT CONTACT THE GROUND. DESIGN THE CONTAINMENT SO THAT IT DOES NOT RESULT IN RUNOFF FROM THE WASHOUT OPERATIONS OR CONTAINMENT AREA.
9. CREATE AND FOLLOW A WRITTEN DISPOSAL PLAN FOR ALL WASTE MATERIALS. INCLUDE IN THE PLAN HOW THE MATERIAL WILL BE DISPOSED OF AND THE LOCATION OF THE DISPOSAL SITE. SUBMIT PLAN TO THE ENGINEER.
10. USE METHODS AND OPERATIONAL PROCEDURES THAT PREVENT DISCHARGE OR PLACEMENT OF BITUMINOUS GRINDINGS, CUTTINGS, MILLINGS, AND OTHER BITUMINOUS WASTES FROM AREAS OF EXISTING OR FUTURE VEGETATED SOILS AND FROM ALL WATER CONVEYANCE SYSTEMS, INCLUDING INLETS, DITCHES AND CURB FLOW LINES.
11. USE METHODS AND OPERATIONAL PROCEDURES THAT PREVENT CONCRETE DUST, PARTICLES, CONCRETE WASH OUT, AND OTHER CONCRETE WASTES FROM LEAVING SITE, DEPOSITING IN EXISTING OR FUTURE VEGETATED AREAS, AND FROM ENTERING STORMWATER CONVEYANCE SYSTEMS, INCLUDING INLETS, DITCHES AND CURB FLOW LINES. USE METHODS AND OPERATIONAL PROCEDURES THAT PREVENT SAW CUT SLURRY AND PLANING WASTE FROM LEAVING SITE AND FROM ENTERING STORMWATER CONVEYANCE SYSTEMS INCLUDING DITCHES AND CULVERTS.

RECORD RETENTION

THE SWPPP, ALL CHANGES TO IT AND INSPECTION AND MAINTENANCE RECORDS MUST BE KEPT ON-SITE DURING CONSTRUCTION. THE OWNER MUST RETAIN A COPY OF THE SWPPP ALONG WITH THE FOLLOWING RECORDS FOR THREE (3) YEARS AFTER SUBMITTAL OF THE NOTICE OF TERMINATION (NOT):

1. ANY OTHER PERMITS REQUIRED FOR THE PROJECT.
2. RECORDS OF ALL INSPECTION AND MAINTENANCE CONDUCTED DURING CONSTRUCTION
3. ALL PERMANENT OPERATIONS AND MAINTENANCE AGREEMENTS THAT HAVE BEEN IMPLEMENTED INCLUDING ALL RIGHT OF WAY, CONTRACTS, COVENANTS AND OTHER BINDING REQUIREMENTS REGARDING PERPETUAL MAINTENANCE; AND
4. ALL REQUIRED CALCULATIONS FOR DESIGN OF THE TEMPORARY AND PERMANENT STORMWATER MANAGEMENT SYSTEMS.

SWPPP SCHEDULE OF INSTALLATION & MAINTENANCE

ITEM	INSTALLATION	INSPECTION & MAINTENANCE	REMOVAL
SILT FENCE	PRIOR TO COMMENCEMENT OF EARTHWORK OPERATIONS.	INSPECT & MAINT. AFTER EACH RUN-OFF EVENT. REMOVE SEDIMENTS AS REQUIRED.	AFTER TRIBUTARY DRAINAGE AREA IS RESTORED.
ROCK CONST. ENTRANCE	PRIOR TO COMMENCEMENT OF EARTHWORK OPERATIONS.	INSPECT REGULARLY. MAINTAIN AS NEEDED.	PRIOR TO PAVING.
OUTLET SKIMMER STRUCTURE	AFTER POND GRADING IS COMPLETED.	INSPECT REGULARLY. MAINTAIN AS NEEDED.	PERMANENT.
RIP-RAP & FILTER	UPON COMPLETION OF POND GRADING, CONC. SWALE CONST. AND OUTLET INSTALLATION.	INSPECT & MAINTAIN AT LEAST ANNUALLY AND AFTER HEAVY RAINFALL EVENT.	PERMANENT.
DETENTION POND	DURING EARTHWORK OPERATIONS.	AFTER HEAVY RAINFALL EVENTS. REMOVE SEDIMENTS AS NEEDED.	PERMANENT.
SEED & MULCH	AFTER POND GRADING IS COMPLETED.	INSPECT & MAINTAIN AFTER HEAVY RAINS. REPLACE WASH-OUT AREAS IMMEDIATELY	NO REMOVAL NECESSARY.
INLET PROTECTION	UPON INLET CONSTRUCTING	WHEN 1/3 CAPACITY OF BMP IS REACHED	AFTER TRIBUTARY AREAS ARE FULLY RESTORED

DESCRIPTION OF PERMANENT STORMWATER TREATMENT SYSTEMS

RATE CONTROL WILL BE ACCOMPLISHED THROUGH EXISTING AND PROPOSED PONDS/WETLANDS, SWALES, AND DEPRESSIONS. VOLUME CONTROL WILL BE ACCOMPLISHED THROUGH FOUR FILTRATION BASINS THROUGHOUT THE SITE. SEE STORMWATER MANAGEMENT PLAN.

CALCULATIONS FOR TEMPORARY & PERMANENT STORMWATER TREATMENT SYSTEMS

SEE STORMWATER MANAGEMENT PLAN.

ESTIMATED BMPS QUANTITIES

BMP	ORIGINAL ESTIMATE	MODIFICATION	DATE
ENERGY DISSIPATER			
TEMP. DIVERSION DIKES			
CHECK DAMS			
TEMP SEEDING			
PERMANENT SEEDING			
PERMANENT SODDING			
MULCHES (SPECIFY TYPES)			
CAT 3 EROSION CONTROL BLANKET			
SOIL TACKIFIERS			
SILT FENCING	38,700 LF		
EROSION CONTROL MATS			
STORM DRAIN INLET PROTECTION	10 EA		
TEMPORARY OR PERMANENT SEDIMENTATION BASINS			
CONSTRUCTION ENTRANCE	2 EA		
DEWATERING (TREATMENT LOCATION, SCHEMATIC, & SAMPLING PLAN REQUIRED			

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BURL OAKS - COURSE RENOVATION PROJECT

5400 N ARM DR
MINNETRISTA, MN 55364

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SIGNATURE: NOT FOR CONSTRUCTION

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MCWD PERMIT APPLICATION
01/16/2025

DESIGNED:	DRAWN:	CHECKED BY:
AT	JR	AT

DRAWING TITLE

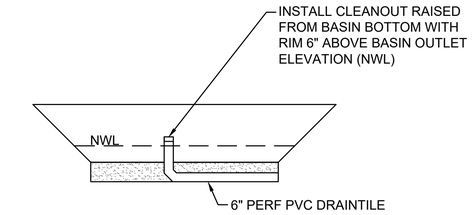
SWPPP - PG 2

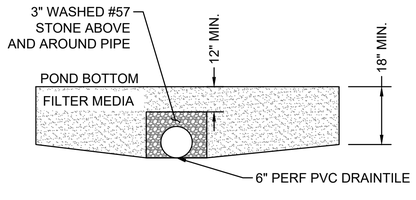
DRAWING NO.

C13

PLOTTED:	COMM. NO.
----	17652

Feb 21, 2025 - 12:39am AThiele
Xref Filename: \ 17652 22x34 AE Commercial Title Block\
Y:\17600\17652 BURL OAKS - COURSE RENOVATION PROJECT_ 07 Civil_ 01 CAD files_ 01 SHEETS\17652 C_SWPPP.dwg

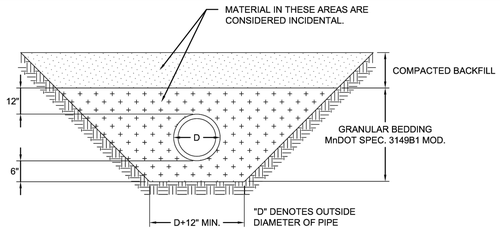




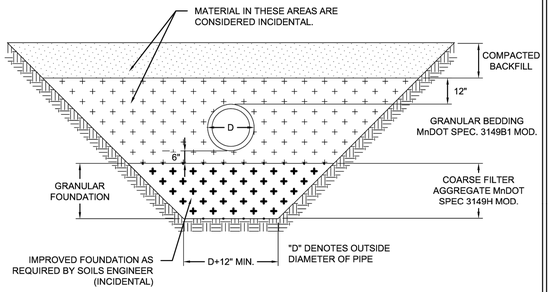
FILTER MEDIA NOTES:

- MEDIA MIX C CONSISTING OF THE FOLLOWING MATERIAL BY VOLUME:
  - COURSE SAND (ASTM C-33) = 85 - 88%
  - FINES (SILT AND CLAY) = 8 - 12%
  - COMPOST (MNDOT 3890 GRADE 2) = 3 - 5%

1 TYPICAL FILTRATION BASIN
NTS



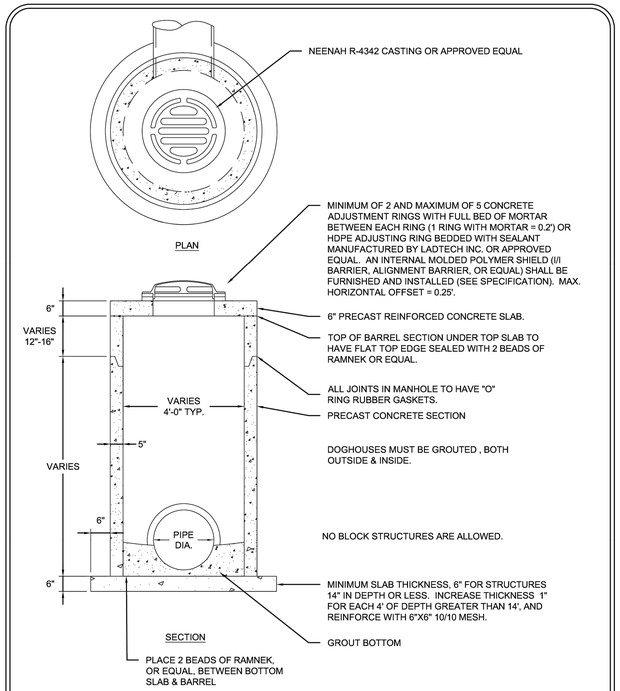
PIPE FOUNDATION & BEDDING IN GOOD SOILS



PIPE FOUNDATION & BEDDING IN POOR SOILS

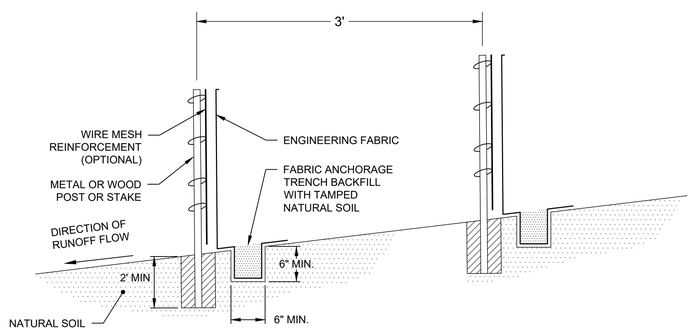
CITY OF MINNETRISTA	BEDDING METHODS FOR PLASTIC PIPE	STANDARD DETAILS Date: JAN. 2022 Revised: BED-01

2 PIPE BEDDING
NTS



CITY OF MINNETRISTA	CATCHBASIN MANHOLE 48" DIAMETER OR LARGER	STANDARD DETAILS Date: JAN. 2022 Revised: STO-07

3 CATCH BASIN MANHOLE
NTS



NOTE: DEPENDING UPON CONFIGURATION, ATTACH FABRIC TO WIRE MESH WITH HOG RINGS, STEEL POSTS WITH TIE WIRES, OR WOOD POSTS WITH STAPLES.

TYPICAL INSTALLATION

4 REDUNDANT SILT FENCE
NTS

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DRAWING TITLE

DETAILS

DRAWING NO.

C14

PLOTTED:	COMM. NO.
----	17652

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DRAWING TITLE

OVERALL STORM UTILITY PLAN

DRAWING NO.

CU0

PLOTTED:	COMM. NO.
----	17652

Feb 21, 2025 - 12:38am AThiele Y:\17600\17652 BURL OAKS - COURSE RENOVATION PROJECT_07 Civil_01 CAD files_01 SHEETS\17652 C_UTIL.dwg
Xref Filename: \ 17652_ s_ base \ 17652 22x34 AE Commercial Title Block \ 4.30.24 -tg-grading plan \ 17041_ 15783_ S_ BASE \ 17041 22x34 AE Commercial Title Block \ 13709_ BOGC_ Wetland_ NODA

NO WORK SHOWN ON THIS SHEET

COUNTY ROAD 110

COUNTY ROAD 110

FAIRWAY RIDGE DR

FAIRWAY RIDGE CT

MATCHLINE: CU2

MATCHLINE: CU4

N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- PROPOSED STORM STRUCTURE
- PROPOSED FLARED END SECTION
- BITUMINOUS PATHWAY
- EXISTING WETLAND
- FLOODPLAIN BOUNDARY
- COURSE FEATURE (GREEN, TEE, FAIRWAY)

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DRAWING TITLE

UTILITY PLAN

DRAWING NO.

CU1

PLOTTED:	COMM. NO.
----	17652

NO WORK SHOWN ON THIS SHEET

MATCHLINE: CU1

MATCHLINE: CU3

MATCHLINE: CU5

N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- PROPOSED STORM STRUCTURE
- PROPOSED FLARED END SECTION
- BITUMINOUS PATHWAY
- EXISTING WETLAND
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DRAWING TITLE

UTILITY PLAN

DRAWING NO.

CU2

PLOTTED:	COMM. NO.
----	17652

N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- PROPOSED STORM STRUCTURE
- PROPOSED FLARED END SECTION
- BITUMINOUS PATHWAY
- EXISTING WETLAND
- FLOODPLAIN BOUNDARY
- COURSE FEATURE (GREEN, TEE, FAIRWAY)

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DRAWING TITLE

UTILITY PLAN

DRAWING NO.

CU3

PLOTTED:	COMM. NO.
----	17652

MATCHLINE: CU1

MATCHLINE: CU5

MATCHLINE: CU8

4

5

8

CBMH-51
RIM 981.50
INV 979.50 (12" OUT)

143 LF 12 inch HDPE Pipe @ 1.05%

N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- PROPOSED STORM STRUCTURE
- PROPOSED FLARED END SECTION
- BITUMINOUS PATHWAY
- EXISTING WETLAND
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- COURSE FEATURE (GREEN, TEE, FAIRWAY)

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DRAWING TITLE

UTILITY PLAN

DRAWING NO.

CU4

PLOTTED:	COMM. NO.
----	17652

MATCHLINE: CU2

MATCHLINE: CU4

MATCHLINE: CU6

MATCHLINE: CU9

CBMH-28
RIM 983.30
INV 979.33 (12" OUT)

248 LF 12 inch HDPE Pipe @ 1.00%

CBMH-29
RIM 979.41
INV 976.86 (12" OUT)
INV 976.85 (12" IN)

86 LF 12 inch HDPE Pipe @ 1.00%

28 LF 12 inch HDPE Pipe @ 1.09%

FES-31
INV 976.20

FES-32
INV 976.50

FES-30
INV 976.00

FES-33
INV 974.50

FES-34
INV 974.00

47 LF 18 inch HDPE Pipe @ 1.07%

FES-35
INV 969.00

68 LF 24 inch HDPE Pipe @ 0.59%

FES-36
INV 968.60

FES-27
INV 974.00

140 LF 18 inch HDPE Pipe @ 0.72%

FES-26
INV 975.00

FES-25
INV 975.40

27 LF 18 inch HDPE Pipe @ 1.09%

FES-24
INV 975.70

INV.=977.3

EX. 12" PVC

CBMH-37
RIM 963.50
INV 960.00 (24" OUT)

FES-38
INV 954.90

FES-39
INV 954.90

395 LF 24 inch HDPE Pipe @ 1.29%

237 LF 12 inch HDPE Pipe @ 0.59%

1

18

6

7

0 50' 100'

LEGEND

- PROPERTY LIMITS
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- PROPOSED STORM STRUCTURE
- PROPOSED FLARED END SECTION
- BITUMINOUS PATHWAY
- EXISTING WETLAND
- FLOODPLAIN BOUNDARY
- COURSE FEATURE (GREEN, TEE, FAIRWAY)

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DRAWING TITLE

UTILITY PLAN

DRAWING NO.

CU5

PLOTTED:	COMM. NO.
----	17652

Feb 21, 2025 - 12:40am ATheile
Xref Filename: \ 17652__s__base \ 17652 22x34 AE Commercial Title Block \ 4.30.24 -grading plan \ 17041__15783__S__BASE \ 17041 22x34 AE Commercial Title Block \ 13709_BOGC__Wetland__NOD\
Y:\17600\17652 BURL OAKS - COURSE RENOVATION PROJECT__07 Civil__01 CAD files__01 SHEETS\17652 C__UTIL.dwg

MATCHLINE: CU3

MATCHLINE: CU5

MATCHLINE: CU7

MATCHLINE: CU10

231 LF 12 inch HDPE Pipe @ 0.22%

FES-10
INV 955.50

FES-40
INV 956.30

FES-41
INV 956.40

117 LF 12 inch HDPE Pipe @ 0.56%

FES-42
INV 957.06

108 LF 12 inch HDPE Pipe @ 4.16%

FES-45
INV 974.50

P2 P3 P4 P5 P6 P7 P8 P9

N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- PROPOSED STORM STRUCTURE
- PROPOSED FLARED END SECTION
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- COURSE FEATURE (GREEN, TEE, FAIRWAY)

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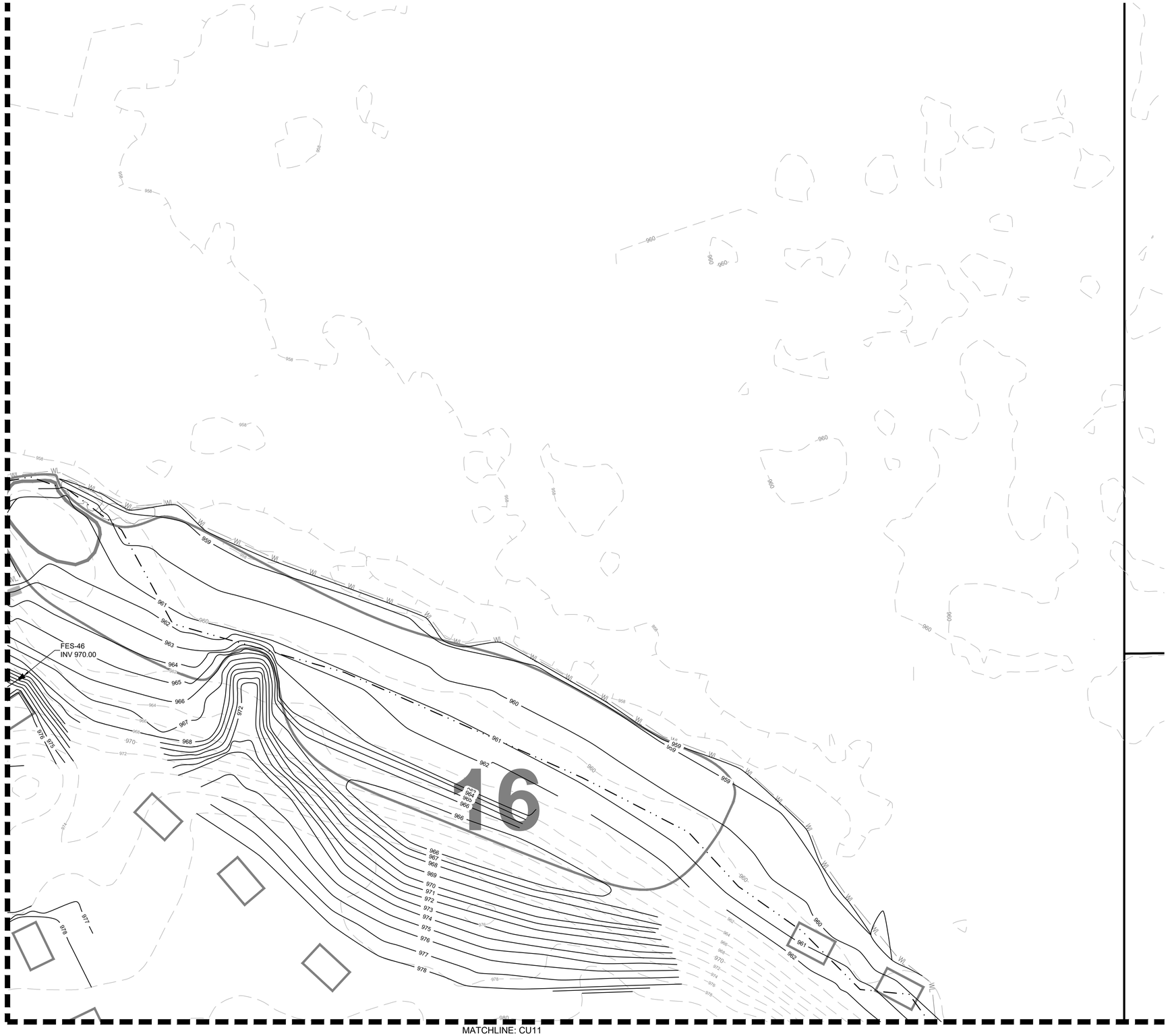
DRAWING TITLE

UTILITY PLAN

DRAWING NO.

CU6

PLOTTED:	COMM. NO.
----	17652



N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- PROPOSED STORM STRUCTURE
- PROPOSED FLARED END SECTION
- BITUMINOUS PATHWAY
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- COURSE FEATURE (GREEN, TEE, FAIRWAY)

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DRAWING TITLE

UTILITY PLAN

DRAWING NO.

CU7

PLOTTED:	COMM. NO.
----	17652

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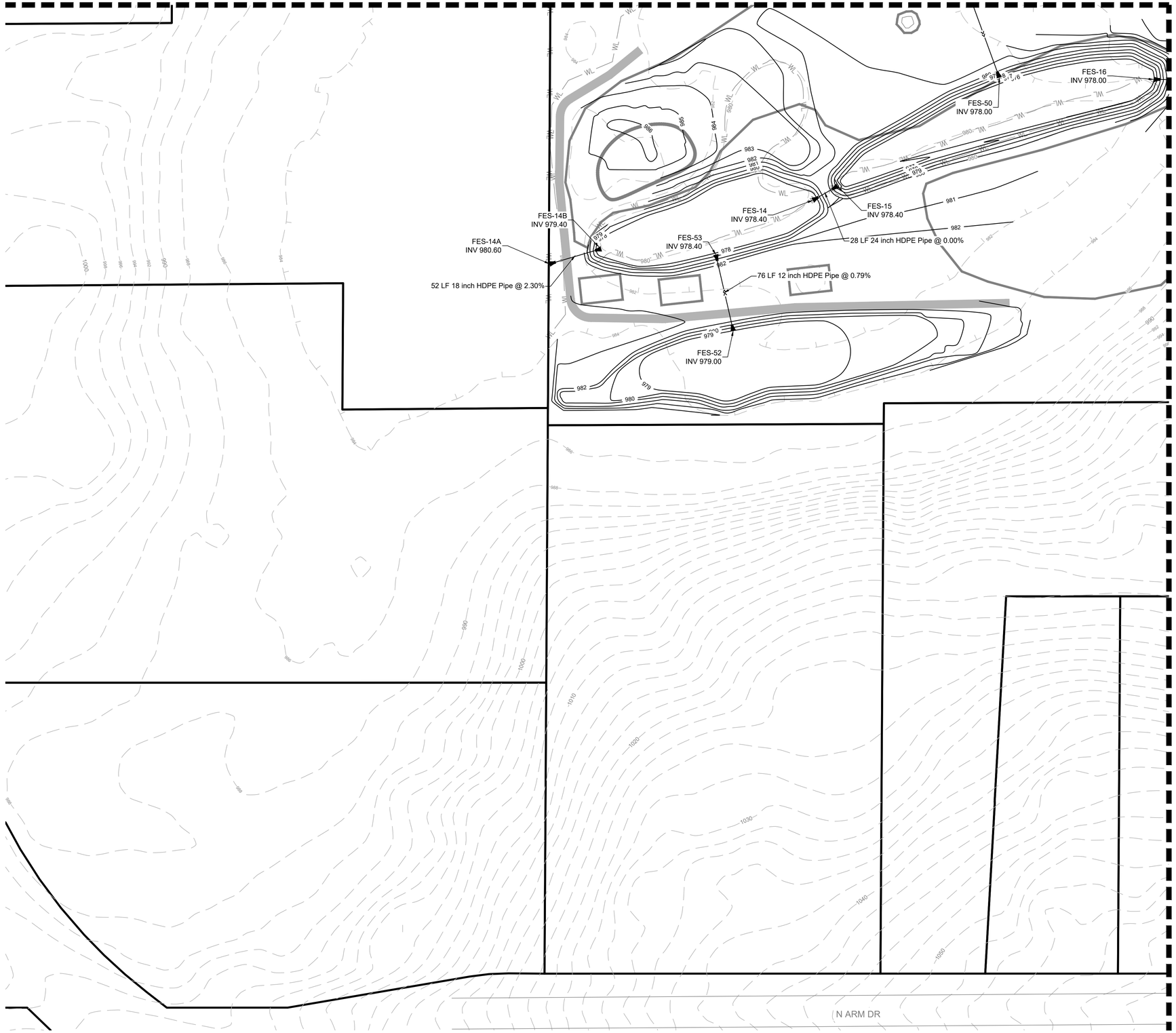
Xref Filename: \ 17652_ s_ base \ 17652 22x34 AE Commercial Title Block \ 4.30.24 +grading plan \ 17041_15783_ S_ BASE \ 17041 22x34 AE Commercial Title Block \ 13708_ BOGC_ Wetland_ NOD\

MATCHLINE: CU4



MATCHLINE: CU9

N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- PROPOSED STORM STRUCTURE
- PROPOSED FLARED END SECTION
- BITUMINOUS PATHWAY
- EXISTING WETLAND
- FLOODPLAIN BOUNDARY
- COURSE FEATURE (GREEN, TEE, FAIRWAY)

ANDERSON

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Anderson Engineering of Minnesota, LLC

BURL OAKS - COURSE RENOVATION PROJECT

5400 N ARM DR
MINNETRISTA, MN 55364

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

PRINT NAME: ADAM THIELE, PE

SIGNATURE: NOT FOR CONSTRUCTION

DATE: 01/16/2025 LICENSE NO. 51317

REVISION LOG

NO.	DATE	DESCRIPTION OF REVISIONS
1	02/09/25	REVISED PER MCWD COMMENT
2	02/18/25	REVISED WETLAND RESTORATION

MCWD PERMIT APPLICATION
01/16/2025

DESIGNED:	DRAWN:	CHECKED BY:
AT	JR	AT

DRAWING TITLE

UTILITY PLAN

DRAWING NO.

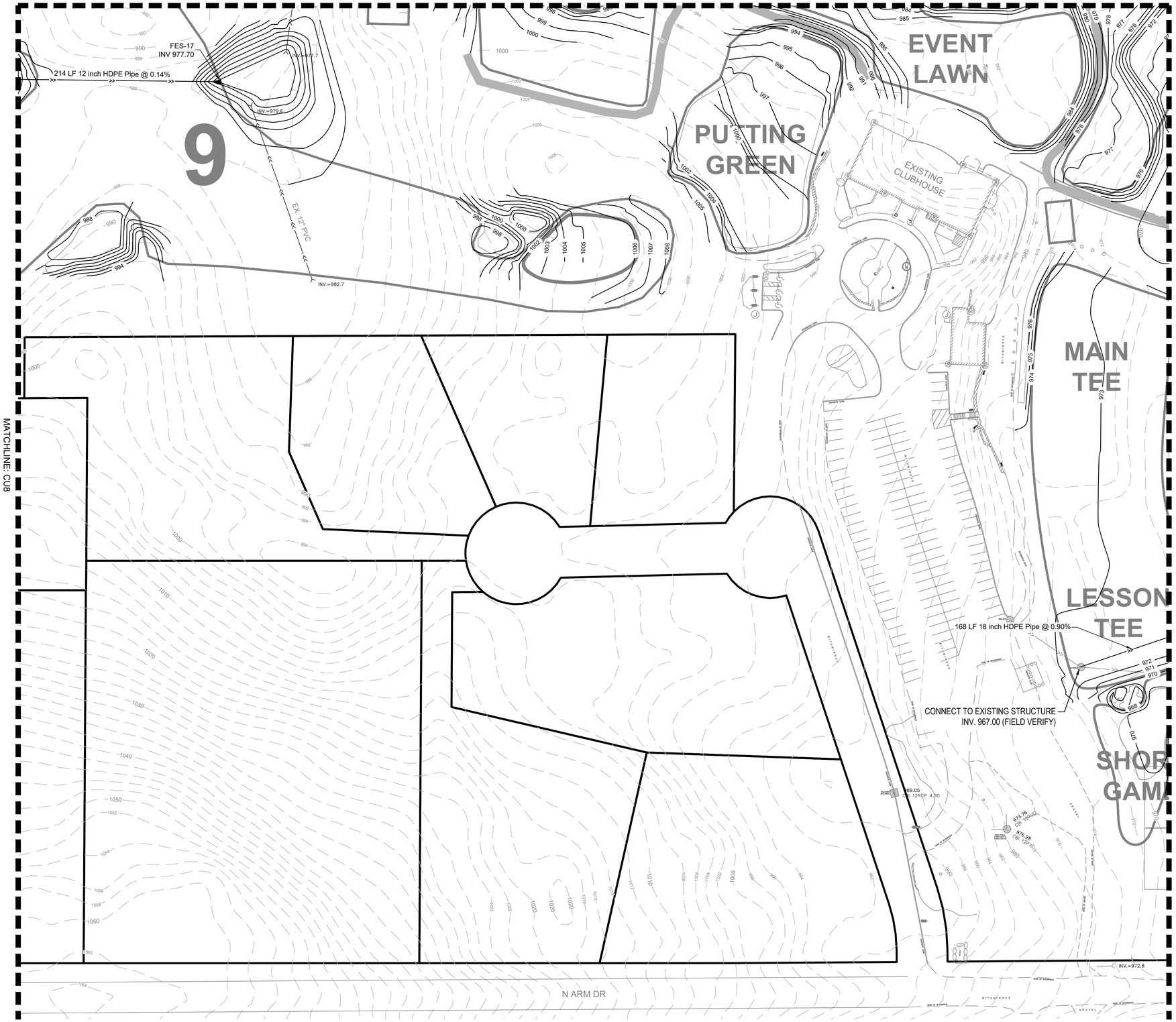
CU8

PLOTTED:	COMM. NO.
----	17652

MATCHLINE: CU5

MATCHLINE: CU8

MATCHLINE: CU10



N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- PROPOSED STORM STRUCTURE
- PROPOSED FLARED END SECTION
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- EXISTING WETLAND
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DRAWING TITLE

UTILITY PLAN

DRAWING NO.

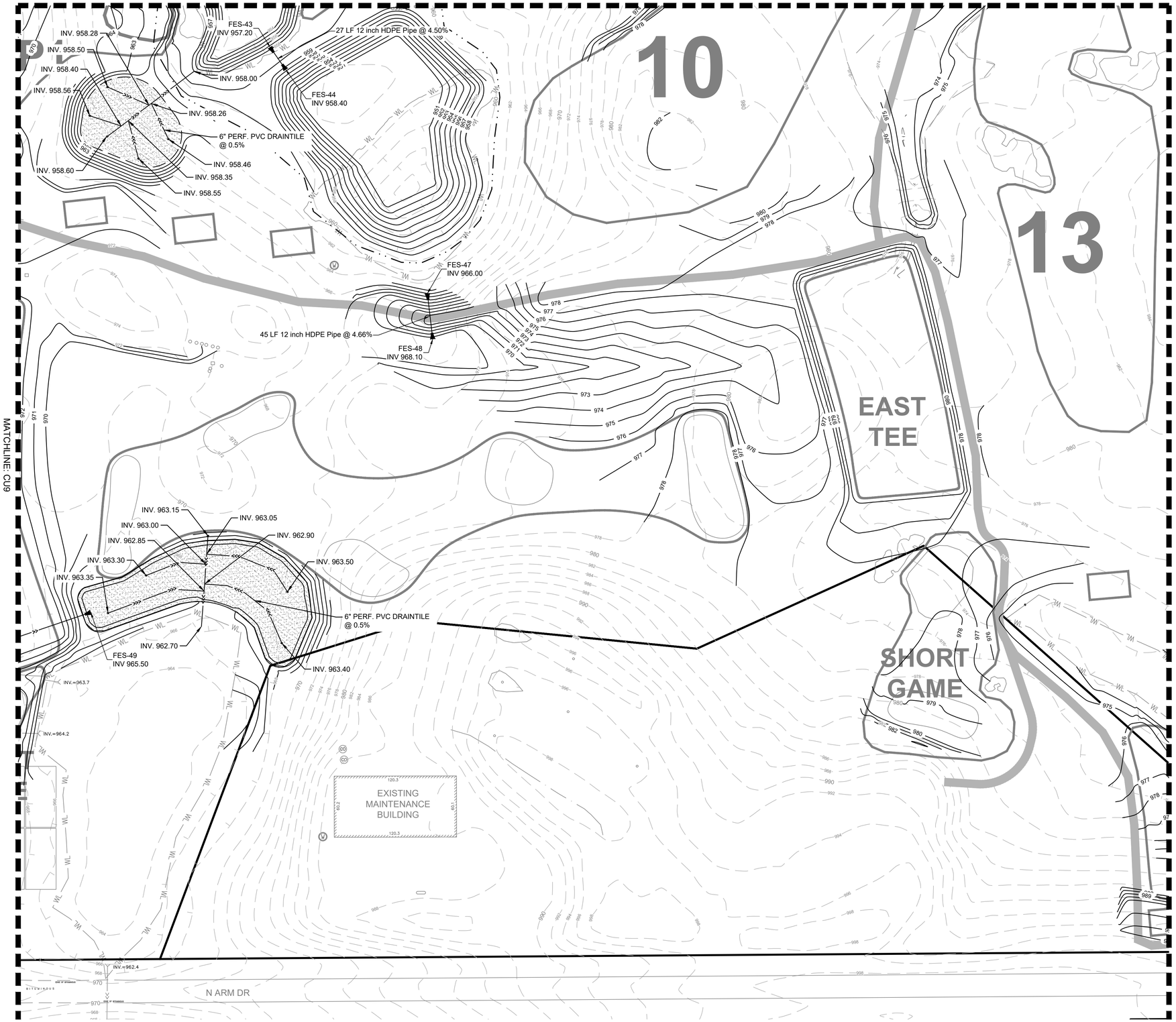
CU9

PLOTTED:	COMM. NO.
----	17652

MATCHLINE: CU6

MATCHLINE: CU9

MATCHLINE: CU11



N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- PROPOSED STORM STRUCTURE
- PROPOSED FLARED END SECTION
- BITUMINOUS PATHWAY
- EXISTING WETLAND
- FLOODPLAIN BOUNDARY
- COURSE FEATURE (GREEN, TEE, FAIRWAY)
- PROPOSED 6" DRAINTILE
- PROPOSED CLEANOUT

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DRAWING TITLE

UTILITY PLAN

DRAWING NO.

CU10

PLOTTED:	COMM. NO.
----	17652

Feb 21, 2025 - 12:40am AThiele
Xref Filename: \ 17652__s__base \ 17652 22x34 AE Commercial Title Block \ 4.30.24 *grading plan \ 17041__15783__S__BASE \ 17041 22x34 AE Commercial Title Block \ 13709__BOGC__Wetland_NOD
Y:\17600\17652 BURL OAKS - COURSE RENOVATION PROJECT__07 Civil__01 CAD files__01 SHEETS\17652 C__UTIL.dwg

MATCHLINE: CU7

MATCHLINE: CU10

NO WORK SHOWN ON THIS SHEET

15

14

11

12

N ARM DR

N

0 50' 100'

LEGEND

- PROPERTY LIMITS
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- PROPOSED STORM STRUCTURE
- PROPOSED FLARED END SECTION
- BITUMINOUS PATHWAY
- EXISTING WETLAND
- FLOODPLAIN BOUNDARY
- COURSE FEATURE (GREEN, TEE, FAIRWAY)

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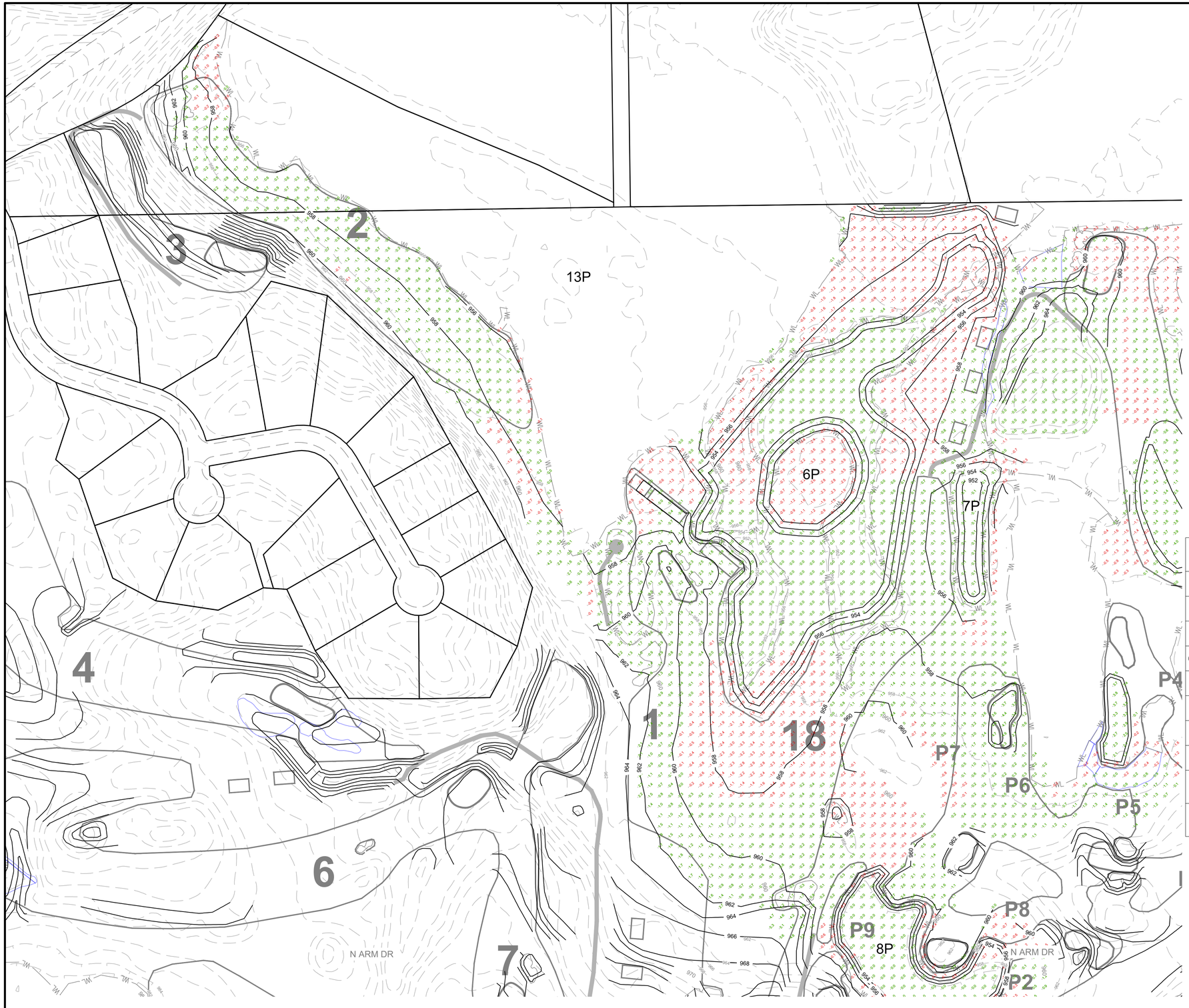
DRAWING TITLE

UTILITY PLAN

DRAWING NO.

CU11

PLOTTED:	COMM. NO.
----	17652



N

0 250' 500'

LEGEND

- PROPERTY LIMITS
- CONSTRUCTION LIMITS
- EXISTING CONTOUR
- PROPOSED CONTOUR
- BITUMINOUS PATHWAY
- EXISTING WETLAND
- WETLAND BUFFER
- FLOODPLAIN BOUNDARY
- FLOODPLAIN CUT AREA
- FLOODPLAIN FILL AREA

FLOODPLAIN CUT/FILL BASINS

BASIN	EXISTING 5YR OWL	EXISTING 100YR HWL	CUT (CY)	FILL (CY)	NET (CY)
1P	981.07	983.63	2,561	1,320	(1,241)
2P	984.68	985.96	180	6	(174)
3P	981.79	981.93	-	-	-
6P & 13P	956.28	960.50	26,834	25,957	(877)
7P	956.25	956.98	224	13	(211)
8P	957.87	959.40	522	437	(85)
9P	959.62	959.83	63	44	(19)
10P	975.44	975.63	8	-	(8)
15P	963.93	966.81	37	27	(10)
16P	972.23	974.28	1,031	390	(641)

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DRAWING TITLE

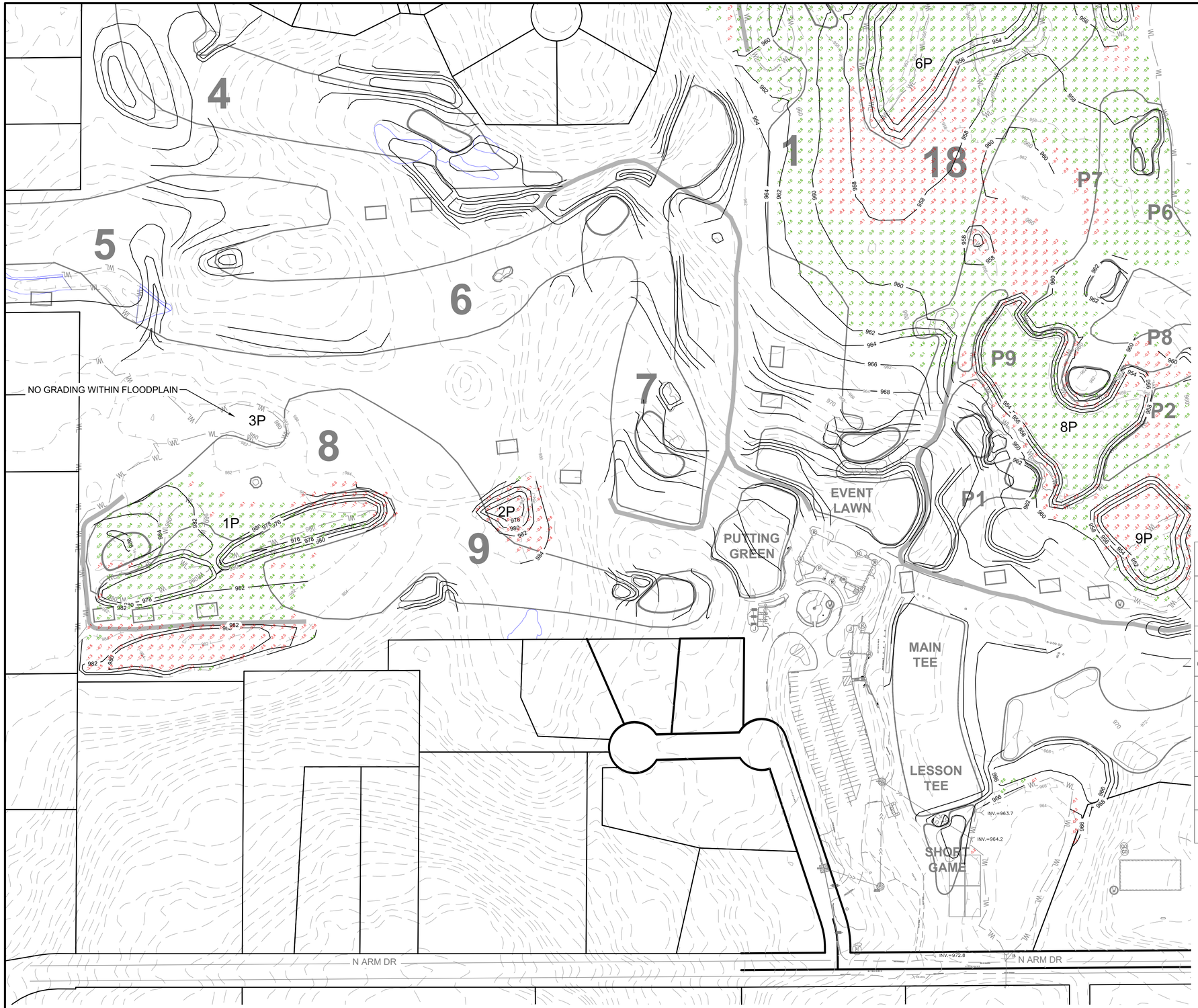
FLOODPLAIN EARTHWORK BALANCE EXHIBIT

DRAWING NO.

FP1

PLOTTED:	COMM. NO.
----	17652

Feb 21, 2025 - 12:24am ATThiele Y:\17600\17652 BURL OAKS - COURSE RENOVATION PROJECT_07 Civil_01 CAD files_01 SHEETS\17652 C_ FLOODPLAIN ANALYSIS.dwg
Xref Filename: \ 17652 22x34 AE Commercial Title Block \ 4.30.24 -grading plan \ 17041_15783_ S_ BASE \ 17041 22x34 AE Commercial Title Block \ 13709_ BOSC_ Wetland_ NOD\



N

0 250' 500'

LEGEND

- PROPERTY LIMITS
- CONSTRUCTION LIMITS
- EXISTING CONTOUR (966)
- PROPOSED CONTOUR (966)
- BITUMINOUS PATHWAY
- EXISTING WETLAND (WL)
- WETLAND BUFFER
- FLOODPLAIN BOUNDARY
- FLOODPLAIN CUT AREA
- FLOODPLAIN FILL AREA

FLOODPLAIN CUT/FILL BASINS

BASIN	EXISTING 5YR OWL	EXISTING 100YR HWL	CUT (CY)	FILL (CY)	NET (CY)
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2P	984.68	985.96	180	6	(174)
3P	981.79	981.93	-	-	-
6P & 13P	956.28	960.50	26,834	25,957	(877)
7P	956.25	956.98	224	13	(211)
8P	957.87	959.40	522	437	(85)
9P	959.62	959.83	63	44	(19)
10P	975.44	975.63	8	-	(8)
15P	963.93	966.81	37	27	(10)
16P	972.23	974.28	1,031	390	(641)

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01/16/2025

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AT	JR	AT

DRAWING TITLE

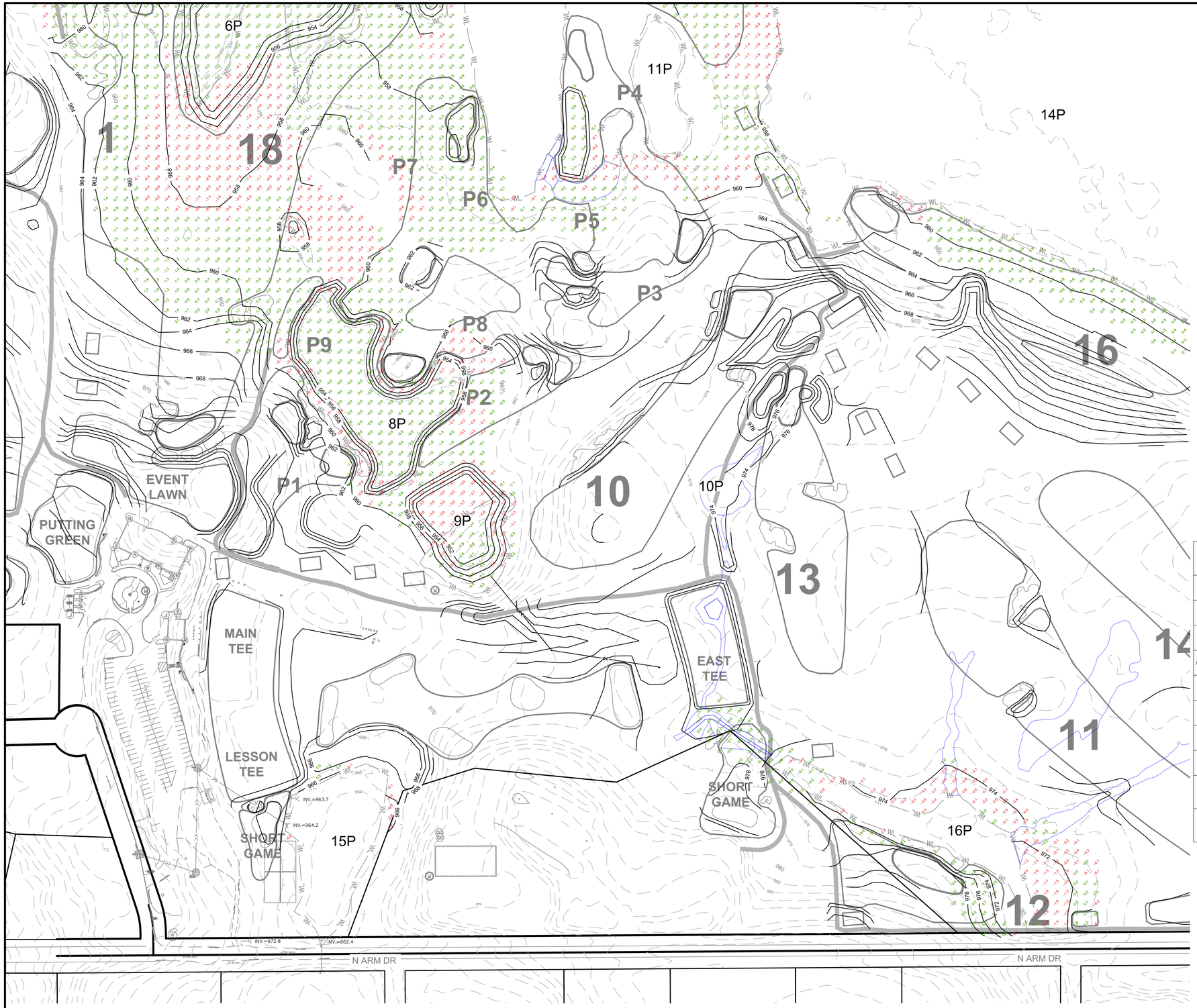
FLOODPLAIN EARTHWORK BALANCE EXHIBIT

DRAWING NO.

FP2

PLOTTED:	COMM. NO.
----	17652

Feb 21, 2025 - 12:24am AThiele Y:\17600\17652\ BURL OAKS - COURSE RENOVATION PROJECT_ 07 Civil_ 01 CAD files_ 01 SHEETS\17652 C_ FLOODPLAIN ANALYSIS.dwg
Xref Filename: \ 17652 22x34 AE Commercial Title Block \ 4.30.24 -grading plan \ 17041_15783_ S_ BASE \ 17041 22x34 AE Commercial Title Block \ 13789_ BOGC_ Wetland_ NOD\



N

0 250' 500'

LEGEND

- PROPERTY LIMITS
- CONSTRUCTION LIMITS
- EXISTING CONTOUR (966)
- PROPOSED CONTOUR (966)
- BITUMINOUS PATHWAY
- EXISTING WETLAND (WL)
- WETLAND BUFFER
- FLOODPLAIN BOUNDARY
- FLOODPLAIN CUT AREA
- FLOODPLAIN FILL AREA

FLOODPLAIN CUT/FILL BASINS

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2P	984.68	985.96	180	6	(174)
3P	981.79	981.93	-	-	-
6P & 13P	956.28	960.50	26,834	25,957	(877)
7P	956.25	956.98	224	13	(211)
8P	957.87	959.40	522	437	(85)
9P	959.62	959.83	63	44	(19)
10P	975.44	975.63	8	-	(8)
15P	963.93	966.81	37	27	(10)
16P	972.23	974.28	1,031	390	(641)

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MCWD PERMIT APPLICATION
01/16/2025

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AT	JR	AT

DRAWING TITLE

FLOODPLAIN EARTHWORK BALANCE EXHIBIT

DRAWING NO.

FP3

PLOTTED:	COMM. NO.
----	17652

Feb 21, 2025 - 12:24am AThiele
Y:\17600\17652 BURL OAKS - COURSE RENOVATION PROJECT_ 07 Civil_ 01 CAD files_ 01 SHEETS\17652 C_ FLOODPLAIN ANALYSIS.dwg
Xref Filename: \ 17652 22x34 AE Commercial Title Block \ 4.30.24 -g-grading plan \ 17041_ 15783_ S_ BASE \ 17041 22x34 AE Commercial Title Block \ 13709_ BOSC_ Wetland_ NOD\

BASIN INFO				EXISTING CONDITIONS								PROPOSED CONDITIONS								PERMIT REQUIREMENTS								
Existing Waterbody	`	Type	Management Class	Existing Runoff Rates (cfs)			Existing NWL	5 yr HWL	100 yr HWL	Innundation Period (hrs) (below 0.05cfs)		Proposed Condition	Changes to Hydrology (Storage, outlet elevation, outlet type)	Proposed Runoff Rates (cfs)			Proposed NWL	5 yr HWL	100 yr HWL	Change in NWL (runout control)	Permitted Change in NWL	Change in Bounce for 100yr Event	Permitted Change in Bounce	Innundation Period (hrs) (below 0.05cfs)		Change in Innundation Period (day)		Notes
				2yr	10yr	100yr				2yr	100yr			2yr	10yr	100yr								2yr	100yr	2yr	100yr	
1P	17 & 18	Type 5 Wetland	2	3.57	4.73	5.95	977.90	981.07	983.63	61	70	Remains node 1P	Permitted fill and excavation to maintain storage capcity	2.24	3.83	5.10	978.00	980.87	984.08	0.10	1.0	0.45	1.00	61	74	0.0	0.2	Outlet invert raised 0.1' to promote pipe flows
2P	NA	Depression	NA	6.41	7.32	26.93	977.30	984.68	985.96	NA	NA	Remains node 2P	Regrade area to provide additional storage	4.70	6.09	12.55	977.30	982.18	985.47	0.00	NA	-0.49	No Limit	NA	NA			2 incoming pipes to 1 outgoing pipe
3P	16	Type 5 Wetland	2	4.15	13.29	36.61	981.70	981.79	981.93	33	35	Remains node 3P	None	2.32	18.23	49.15	981.50	981.99	982.19	-0.20	1.0	0.26	1.00	27	29	-0.3	-0.3	Non-functional outlet pipe removed. New area drain to be installed 0.2ft lower than overland overflow
4P	15	Type 5 Wetland	2	3.08	9.44	24.43	989.20	989.75	990.08	58	59	Permitted Wetland Fill (removed from hydrology)		NA	NA	NA	NA	NA	NA	NA	1.0	NA	1.00	NA	NA	NA	NA	Permit Received
5R	28P	Ephimeral Flow Path	NA	28.26	54.20	113.91	NA	NA	NA	NA	NA	Remains 5R	None	19.05	43.48	93.80	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Culverts along swale replaced in kind
28P	6P	End of Flow Path	NA	26.32	54.52	113.96	959.90	964.66	964.98	NA	NA	Remains 28P	Add Catchbasin Manhole	18.99	43.46	93.78	963.50	965.57	965.90	3.60	NA	NA	NA	NA	NA	NA	NA	Area regraded to remove steep slope around culvert inlet. Construct manhole inlet to allow grading
6P	23	Type 5 Wetland	3	21.13	49.29	156.09	954.90	955.70	956.73	580	640	Remains 6P	Regrade basin / Remove pipe overflow	17.18	42.93	129.7	954.90	955.54	956.52	0.00	4.0	-0.21	No Limit	588	654	0.3	0.6	Basin regraded to provide storage. Removal of overflow culverts to promote natural restoration of area
7P	5	Type 3 Wetland	2	1.17	3.78	47.00	954.80	956.25	956.98	46	49	Remains node 7P	Sediment removal and floodplain regrading	0.35	1.73	15.98	954.90	955.52	957.12	0.10	1.0	0.14	1.00	76	90	1.3	1.7	
8P	6	Type 5 Wetland	3	0.81	1.80	2.78	957.06	957.87	959.40	33	43	Remains node 8P	Sediement removal and outlet revision. No footprint changes	1.29	2.8	3.98	957.06	958.02	959.46	0.00	4.0	0.06	No Limit	48	62	0.6	0.8	
8a	NA	Low Area	NA	0.55	0.88	3.15	NA	NA	961.57	NA	NA	Grading changes remove low spot		NA	NA	NA	NA	NA	NA	NA	NA	NA	No Limit	NA	NA	NA	NA	Low area drain removed
8b	NA	Low Area	NA	3.01	8.21	21.20	NA	NA	958.78	NA	NA	Grading changes remove low spot		NA	NA	NA	NA	NA	NA	NA	NA	NA	No Limit	NA	NA	NA	NA	Low area drain removed
9P	7	Type 5 Wetland	3	0.66	10.31	53.72	958.40	959.62	959.83	32	40	Remains node 9P	Excavate to expand irrigation pond volume, EOF and outlet revised.	1.57	3.95	42.44	958.40	959.40	960.38	0.00	4.0	0.55	No Limit	39	52	0.3	0.5	Pond expanded and outflow changed from standpipe to culvert
10P	3	Type 5 Wetland	3	3.68	8.80	21.79	975.30	975.44	975.63	23	25	Remains node 10P	Small change in drainage area	3.08	7.62	19.32	975.30	975.43	975.60	0.00	4.0	-0.03	No Limit	25	26	0.1	0.0	Overland overflow remains
11P	4	Type 3 Wetland	3	2.51	13.67	42.45	955.50	956.31	956.73	38	40	Remains node 11P	No Changes to Hydrology	0.28	2.12	28.41	955.50	956.04	956.59	0.00	4.0	-0.14	No Limit	67	80	1.2	1.7	Non-functional pipe and sluice gate removed from property.
13P	23	Type 2/5/7 Wetland	3	10.10	24.57	39.96	954.40	956.28	958.78	618	678	Remains 13P	No Changes to Hydrology	8.66	23.19	39.85	954.40	956.13	958.76	0.00	4.0	-0.02	No Limit	590	606	-1.2	-3.0	No changes within basin
14P	5	Type 3/7 Wetland	3	4.10	13.05	45.99	955.20	956.26	957.84	542	602	Remains 14P	Outlet revised from 60" CMP to Dual 36" HDOE	3.50	12.40	46.24	955.20	956.16	957.71	0.00	4.0	NA	No Limit	560	602	0.8	0.0	Dual 36" HDPE provide similar hydraulics as 60" CMP
15F	NA	FILTRATION BASIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	Newly Constructed Filtration Basin		9.79	25.37	56.51	966.50	966.83	967.13	NA	NA	NA	No Limit	NA	NA	NA	NA	Filtration Basin
15P	8	Type 3/5 Wetland	2	3.73	8.02	12.24	962.40	963.93	966.81	41	44	Remains 15P	Inflow intercepted by ujpstream filtration basin	2.52	7.31	11.51	962.40	963.63	966.35	0.00	1.0	-0.46	1.00	50	52	0.4	0.3	
16P	2	Type 2/3 Wetland	1	8.98	13.69	18.48	970.00	972.23	974.28	26	27	Remains 16 P	None	8.57	13.66	17.86	970.00	972.11	974.07	0.00	0.0	-0.21	0.50	26	27	0.0	0.0	
17P	NA	STORM POND	NA	NA	NA	NA	NA	NA	NA	NA	NA	Newly Constructed Pond		2.11	4.92	12.17	957.50	957.56	957.64	NA	NA	NA	NA	NA	NA	NA	NA	
26P	1P	LOW AREA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Newly Constructed Low Area (culvert controlled)		3.19	4.45	12.77	979.00	980.83	982.91	NA	NA	NA	NA	NA	NA	NA	NA	
20P	NA	NEW SWALE	NA	NA	NA	NA	NA	NA	NA	NA	NA	Newly Constructed Swale (culvert controlled)		13.73	35.25	78.67	974.50	978.28	978.84	NA	NA	NA	NA	NA	NA	NA	NA	Controls runoff rate into 5R
24F	NA	FILTRATION BASIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	Newly Constructed Filtration Basin		4.6	13.32	28.04	962.00	962.13	962.27	NA	NA	NA	NA	NA	NA	NA	NA	Filtratio Basin
25P	16	OFFSITE	2	0.68	3.69	9.11	980.6	981.35	983.19	NA	NA	NO CHANGES TO HYDROLOGY, ONLY USED FOR MODEL PURPOSES																
27P	24	Type 3	2	2.88	3.48	7.18	955.4	958.52	959.59	60	86	Remains 27P	Grading revised drainage area	1.33	2.80	3.64	956.3	957.41	959.38	0.90	1.0	-0.21	1.00	50	61	-0.4	-1.0	Removal of connected area drains

EXISTING CONDITIONS AND WETLAND IMPACTS

N

0 200' 400'

0.01 ACRES FILL

0.29 ACRES FILL

0.16 ACRES FILL

0.11 ACRES FILL

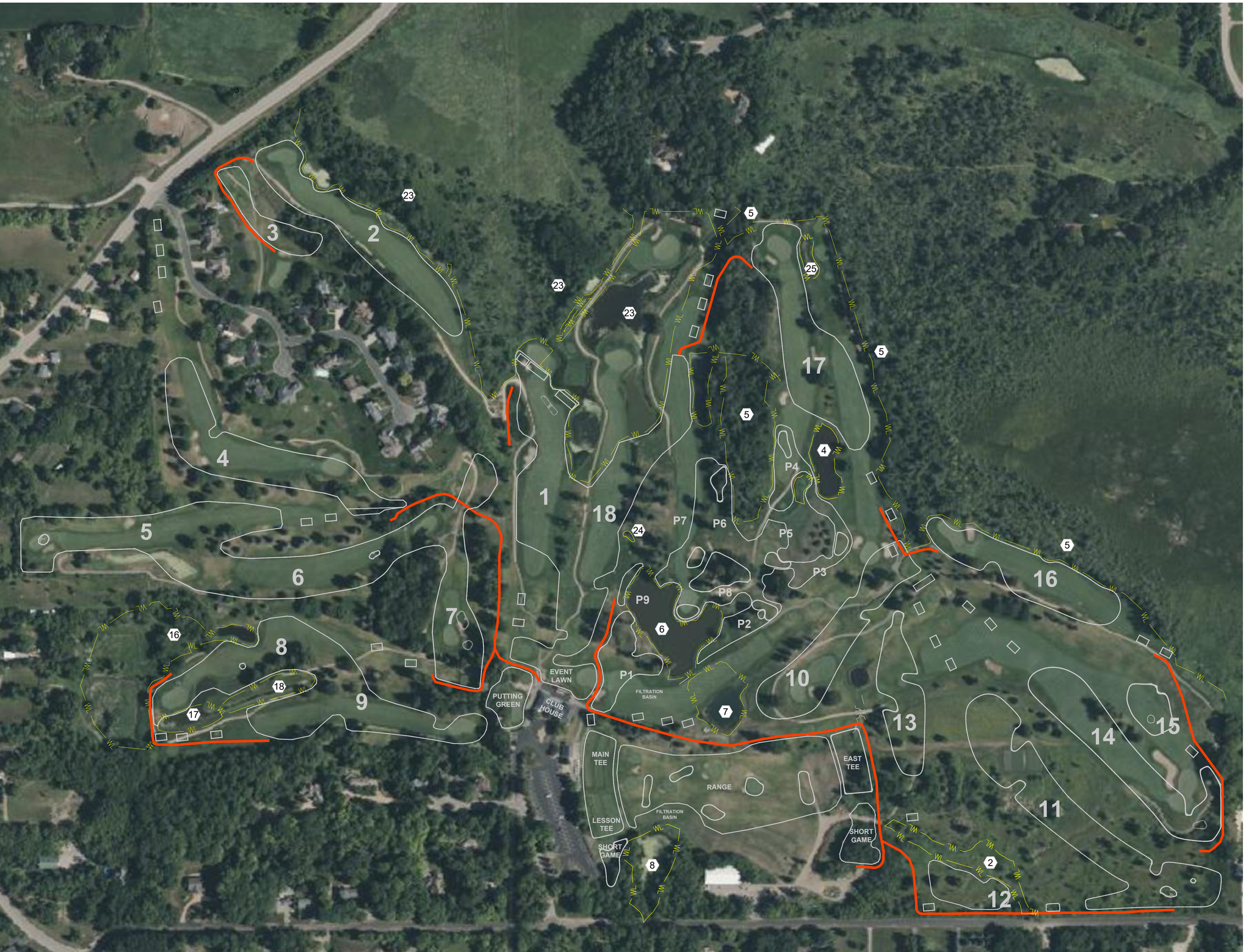
0.11 ACRES FILL

0.05 ACRES FILL

LEGEND

- WETLAND DELINEATION
- PERMANENT WETLAND FILL
- EXISTING HOLE CENTERLINE
- EXISTING CART PATH

PROPOSED DESIGN



REQUIRED WETLAND BUFFERS

WETLAND ID	FAW MANAGE	REQUIRED AREA (SF)
2	1	30,686
4	3	0
5	2	34,975
6	3	9,788
7	3	9,377
8	2	0
16	2	0
17	2	19,234
18	2	4,034
23	3	17,298
24	2	0
		125,392 SF (2.87 ac)

LEGEND

- PROPOSED WETLAND BOUNDARY
- BUFFER - REQUIRED
- PROPOSED HOLE OUTLINE
- PROPOSED CART PATH

PROPOSED FESCUE AREAS AND ADDITIONAL BUFFERS

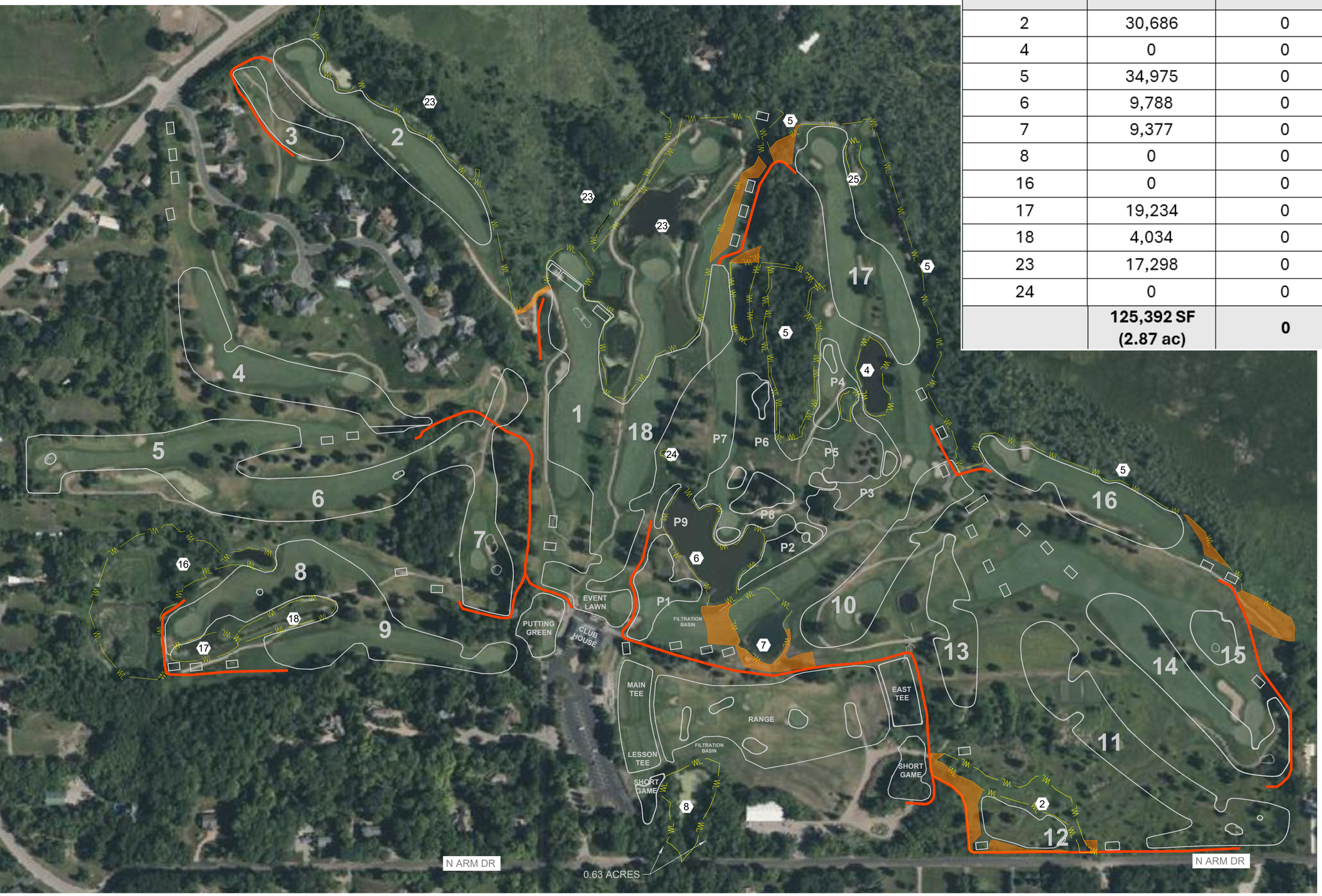
WETLAND ID	REQUIRED AREA (SF)	PROPOSED BUFFER (SF)	NON-ELIGIBLE BUFFER (SF)	NON-ELIGIBLE FESCUE (SF)
2	30,686	0	38,341	23,750
4	0	0	0	0
5	34,975	0	0	33,074
6	9,788	0	0	0
7	9,377	0	0	26,127
8	0	0	27,512	0
16	0	0	0	0
17	19,234	0	0	0
18	4,034	0	0	0
23	17,298	0	0	15,600
24	0	0	0	0
	125,392 SF (2.87 ac)	**0**	**65,853 SF 1.51 ac**	**98,552 SF (2.26 ac)**

PROPOSED FESCUE AREAS WHERE BUFFER REQUIRED

N

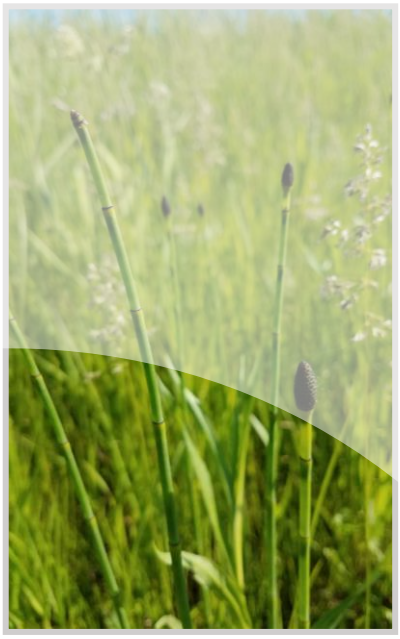
0 200' 400'

WETLAND ID	REQUIRED AREA (SF)	PROPOSED BUFFER (SF)	NON-ELIGIBLE BUFFER (SF)	NON-ELIGIBLE FESCUE (SF)
2	30,686	0	38,341	23,750
4	0	0	0	0
5	34,975	0	0	33,074
6	9,788	0	0	0
7	9,377	0	0	26,127
8	0	0	27,512	0
16	0	0	0	0
17	19,234	0	0	0
18	4,034	0	0	0
23	17,298	0	0	15,600
24	0	0	0	0
	125,392 SF (2.87 ac)	**0**	**65,853 SF 1.51 ac**	**98,552 SF (2.26 ac)**



LEGEND

- WL — PROPOSED WETLAND BOUNDARY
- FESCUE (LONG, LOW MAINT)
- PROPOSED HOLE OUTLINE
- PROPOSED CART PATH



AE PROJECT NO. 17652
MCWD PERMIT NO. 24-401

WETLAND 23 RESTORATION
BURL OAKS GOLF CLUB

5400 N ARM DR
MINNETRISTA, MINNESOTA

February 21, 2025

ANDERSON

13605 1st Avenue North #100, Plymouth, MN 55441
P 763.412.4000 **F** 763.412.4090
ae-mn.com

CONTENTS

SECTIONS

FIGURES

APPENDICIES

1. BACKGROUND, GOALS, & OBJECTIVES

Burl Oaks Golf Club (BOGC) is unable to provide wetland buffers in full compliance with Minnehaha Creek Watershed District's (MCWD) Wetland Protection Rule requirements. The project requires 2.87 acres of buffer around portions of seven wetlands subject to the Waterbody Crossings and Structures Rule and downgradient of reconstructed impervious surface. BOGC has identified 1.51 acres of feasible wetland buffer; however, no buffer is unable to be set aside in the specific locations required by rule. In addition, there will be 2.26 ac of planted low maintenance, tall fescue planted in areas of required buffer that will function as buffer. In lieu of providing required wetland buffers, the project is proposing to restore a portion of Wetland 23 to offset the buffer deficiency. See **Figure 1** for the location of Wetland 23 and the proposed restoration. See **Figure 2** for the engineering plan.

The Minnesota Rapid Assessment Method (MnRAM) was used to assess wetland functions and values associated with the various wetlands. The project triggers required buffers around potions of seven wetlands with Management Classes of 1, 2, 3 having required buffer widths of 40 feet, 30 feet, and 20 feet respectively. MNRAM rates buffer widths as follows; greater than 50 feet as "High", 25-49 feet as "Medium", and 1-24 feet as "Low". While inputting the MCWD required buffer into MNRAM may raise the buffer rating from Low to Medium, it does not result in change of management class of the wetland.

MCWD functional Assessment of Wetlands map layer identifies Wetland 23 and adjacent wetlands as having a Manage 3 Management Class per assessment completed November 8, 2001. BWSR's Wetland Management Classification System to Accompany the Minnesota Routine Assessment Method for Evaluating Wetland Functions, Version 3.0 publication indicates Manage 3 wetlands *"would rate low for vegetative diversity/integrity. Many of these wetlands rate medium or high for downstream water quality protection and for flood storage/attenuation. This correlation is expected since wetlands that provide higher levels of water quality treatment and runoff/rate control often suffer from ecological degradation."* Wetlands with higher water quality treatment functions have lower ecological functions; inverse relation.

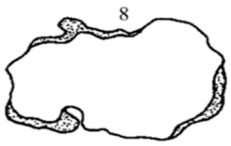
The existing Wetland 23 is characterized by two communities; predominantly open water with some shallow marsh fringe areas dominated by non-native, invasive narrow-leaf cattail. BWSR MNRAM 3.4 for Evaluating Wetland Functions issued 9/15/2010, identifies open water as Low Quality " *Aquatic vegetation absent or coverage is less than 10 percent of the open water area"* and shallow marsh as Low Quality "*Dominated by 1 native aquatic species; and/or purple loosestrife comprise more than 50 percent cover; and/or cattail comprises more than 85 percent cover*."

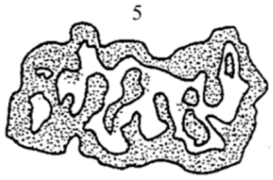
The proposed Wetland 23 restoration would be characterized by three communities; open water, shallow marsh, and wet meadow having planted diverse, native species. BWSR MNRAM 3.4 for Evaluating Wetland Functions issued 9/15/2010, identifies open water as Low Quality " *Aquatic vegetation absent or coverage is less than 10 percent of the open water area"* and shallow marsh as High Quality "*Three or more native aquatic plants (e.g., bur-reeds, bulrushes, arrowheads, duckweeds, cattails, sweet flag, pondweeds) are dominants; or, communities with low diversity but high integrity as described in guidance (e.g., stands of arrowhead, lake sedges). Cattails, if present, comprise less than 40 percent cover. Purple loosestrife absent or comprises less than 20 percent cover*" and wet meadow as High Quality "*Composed of 10 or more species of native/non-invasive grasses, sedges, ferns, rushes and/or forbs. Reed canary grass, purple loosestrife, stinging nettle and/or other invasive species (Table 1), if present, cumulatively comprise less than 20 percent cover. Non-native buckthorns absent or comprise less than 10 percent cover within the wet meadow community*."

The proposed Wetland 23 restoration has increased interspersion from the existing condition; from Low (primarily unvegetated open water) to Medium (combination of some unvegetated open water and vegetative cover). Rooted vegetation in flow-through wetlands slows floodwaters by creating frictional drag in proportion to stem density, more or less according to vegetation cover type and interspersion. Flow-through wetlands with relatively low proportions of open water to rooted vegetation and low interspersion of water and rooted vegetation are more capable of altering flood flows. Dense stands of rooted vegetation, including trees, shrubs, and herbaceous emergent are more capable of slowing floodwater than open water alone.

The proposed Wetland 23 restoration has increased vegetative density from the existing condition increasing the wetland's ability to uptake, metabolize, sequester and/or remove nutrients and imported elements from the water. Microbial processing and bioaccumulation are associated with plant cover including floating, emergent or submergent vegetation. Vegetative density can serve as an index of primary production, which is an indicator of nutrient assimilation. Wetland environments are effective at denitrification. Wetlands take up metals both by adsorption in the soils and by plant uptake via the roots. They allow metabolism of oxygen-demanding materials and can reduce fecal coliform populations. These pollutants are often buried by deposition of newer plant material, isolating them in the sediments.

The proposed Wetland 23 restoration has increased vegetation interspersion cover category from the existing condition; from Low to High. Wetlands that contain vegetation interspersed with open water are more likely to support notably greater on-site diversity and/or abundance of fish and wildlife species. Those with very dense vegetation and no channels or open water areas are less likely to support this function. Vegetation interspersion is a measure of the amount of edge between vegetation and open water, which is valuable to wildlife.





Existing = Low Proposed = High

The proposed Wetland 23 restoration has increased vegetative communities from the existing condition resulting in improved interspersion category; from Low to High. Wetlands that are characterized by multiple vegetative communities, the increased structural diversity and amount of edge associated with greater interspersion is generally positively correlated with wildlife habitat quality.

INTERSPERSION CATEGORY 1

INTERSPERSION CATEGORY 3

Existing = Low Proposed = High

Anderson Engineering used MnRAM 3.2 digital worksheet to determine the functional classification of the proposed restored portion of Wetland 23 (see Appendix A) resulting in Manage 1.

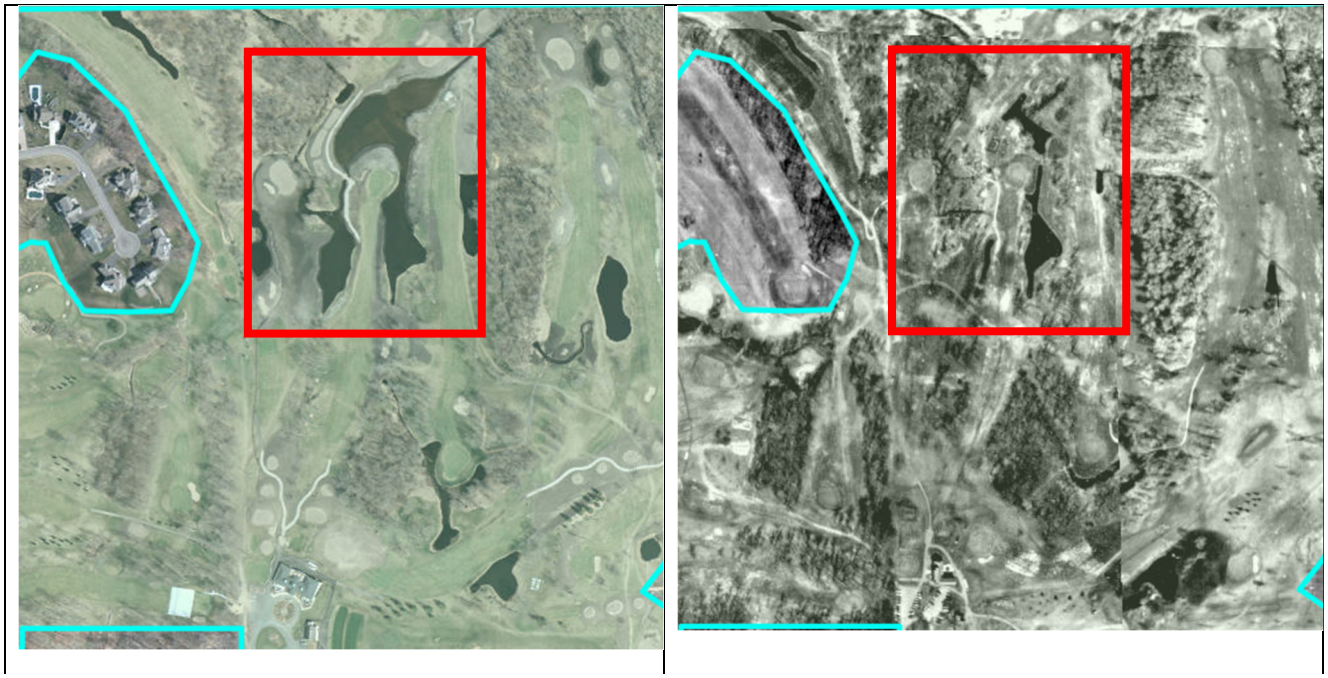
Function Name	Existing W23 MCWD 2001	Restored W23 Anderson 2025
Vegetative Diversity/Integrity	Low	Med
Maintenance of Characteristic Hydrologic Regime	Exceptional *	High
Flood and Stormwater Storage/Attenuation	Exceptional *	Medium
Downstream Water Quality Protection	Exceptional *	High
Maintenance of Wetland Water Quality	Moderate	High
Shoreline Protection	N/A	N/A
Maintenance of Characteristic Wildlife Habitat Structure	Moderate	High
Maintenance of Characteristic Fish Habitat	Low	N/A
Maintenance of Characteristic Amphibian Habitat	*Not Assessed*	Medium
Aesthetics/Recreation/Education/Cultural	Low	Medium
Commercial Use	N/A	N/A
MnRAM Management Classification	**Manage 3**	**Manage 1**

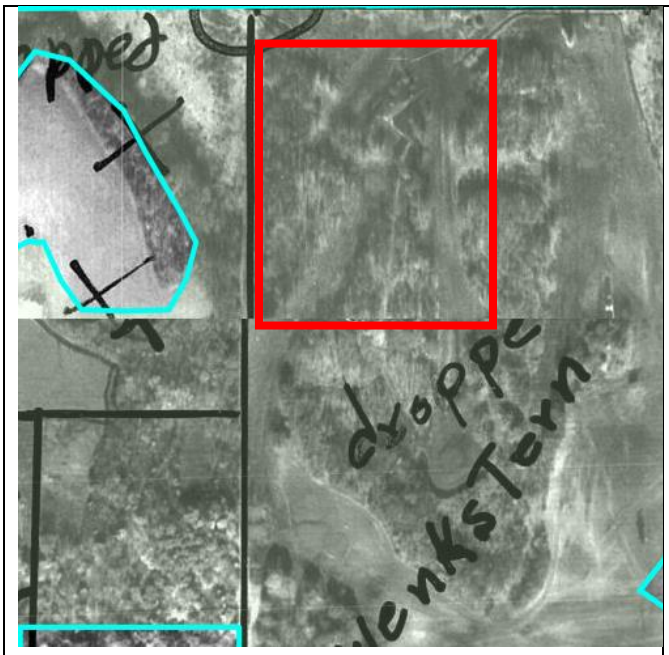
* NOTE: Wetlands with higher water quality treatment functions have lower ecological functions; inverse relation

2. SITE SUITABILITY

2.1 Historic Aerial Photographs

Historic aerial photographs were obtained from Hennepin County Natural Resources Mapper for the years 1957, 1969, 1989, and 2000. This photo series illustrates the general development history from a largely undeveloped condition, construction of the first 9-hole course, construction of the 18-hole course, and present day. Minnesota Historic Aerial Photographs Online hosts an aerial photo of the landscape in 1945; however, the conditions specific to the vicinity of the wetland are of a similar condition.





1969. Forest clearing and construction of the 9-hole golf course.

1957. Undeveloped forested and emergent wetland in an agricultural setting.

2.2 Soil Survey Geographic Database (SSURGO)

Natural Resource Conservation Service (NRCS) SSURGO database was reviewed for the hydric rating of soil map units. The restoration area is primarily underlaid by Muskego and Houghton soils (L50A) and Cordova loam (L23A). According to NRCS, these soils have formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop aerobic conditions in the upper part of the soil profile. Under normal conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of wetland vegetation.

2.2 Topography

Topographic LiDAR contours associated with the restoration area were reviewed on Hennepin County's Natural Resources Mapper. The natural wetland to the north and Wetland 23 are generally situated at 956 feet. Immediately adjacent uplands areas are saturated between 956 feet to 964 feet; however, a majority of upland areas/fairways are situated between 956 feet to 960 feet.

2.3 Restoration Area Suitability

Aside from ditching, the adjacent existing emergent wetland located north of the golf course is largely unchanged since the initial development of the golf course. The resource serves as a general benchmark for assessing the suitability of the proposed restoration area at Wetland 23.

The emergent wetland is generally located below 956 feet and is underlaid by Muskego and Houghton soils (L50A), a hydric soil unit. According to the NRCS, vegetation associated with this soil type is dominantly marsh grasses, reeds, and sedges with scattered hardwoods and water-tolerant trees. It is expected that these soils will contain a native seed bank containing vegetation adapted to wetland conditions.

The vicinity of Wetland 23 has been transformed from wetland dominated by forest, shrubs, and emergent vegetation to excavated open water and upland golf course. The area is predominantly characterized by the same hydric soil units as the adjacent emergent marsh to the north. The area has been cleared of vegetation

and graded to provide upland surfaces for golf. Wetland that was not graded to upland was excavated for stormwater/aesthetic pond features that had served to challenge golf course play. Wetland 23 is generally situated at 956 feet and adjacent golf course features are situated at 960 feet. This suggests that there is between zero to four feet of material overlying native grades.

Wetland hydrology has been documented in the June 28, 2021 wetland delineation. Static surface water was observed in Wetland 23 and water levels are set by the existing stormwater management network. Wetland hydrology feeds the wetland through surface water and groundwater inputs. Based on landscape position and geographic characteristics specific to the restoration area, hydrological conditions are suitable for a wetland restoration project.

The primary mode of restoration at this location should consist of removing historically placed fills to expose native grade. This work should occur within hydric and predominantly hydric soil map units. Wetland bottoms should not be higher than 956 feet and edges should mimic an irregular shape that contains interspersed community types. Wetland communities should be seeded with native vegetation adapted to the targeted community type. Because the area is situated within a stormwater management network, wetland hydraulics need to accommodate the existing drainage condition to ensure the golf course and its neighbors are not adversely affected. As such, it is not practical to restore the hydrologic condition of the wetland present at pre-development times. However, the restoration area will target wetland plant communities, hydric soils, and wetland hydrology characteristics described later in this document.

3. TARGETED WETLAND CHARACTERISTICS

Wetlands are defined by a predominance of hydrophytic vegetation communities, presence of a hydric soil profile, and wetland hydrology. The following wetland characteristics are anticipated.

3.1 Vegetation

The June 28, 2021, wetland delineation supporting the determination at Wetland 23 described a fresh wet meadow, shallow marsh, open water, and wooded swamp. Documented vegetation included green ash, peachleaf willow, box elder maple, gray willow, red elderberry, reed canary grass, smaller duckweed, and stinging nettle. This community was determined to meet hydrophytic criteria.

Restored vegetation communities will target wetland plant communities adapted to fresh wet meadow and shallow marsh conditions (Section 4 specifies native seed mixes). An open water community type is also proposed and anticipated vegetation communities consist of floating or submergent type vegetation. This vegetation community type is anticipated to establish naturally over time.

Native soil is anticipated to contain a historic native seed bank. This seed bank will express vegetation adapted to local conditions. The targeted vegetation community includes any vegetation that is in the seed bank.

3.2 Hydric Soil

The June 28, 2021, wetland delineation supporting the determination at Wetland 23 described a thick dark loamy soil profile within the Muskego and Houghton soils (L50A) unit and is representative of the conditions present within the restoration area. Although this soil profile was inconclusive, the profile was assumed hydric. Due to the presence of a hydrophytic vegetation community and wetland hydrology, it is assumed that the profile would meet hydric soil indicators if the boring was advanced to deeper depths.

Targeted soils are anticipated to be consistent with the typical soil map unit profile described by NRCS. This includes uncovering soils that are black and mucky. Organic materials may include sapric muck, hemic mucky peat, or fibric peat. Soil profiles may also consist of thick dark clay loam with redox concentrations or depletions.

3.3 Hydrology

The June 28, 2021 wetland delineation supporting the determination at Wetland 23 documented the presence of a water table at the ground surface and a saturated soil condition. This characteristic met primary wetland hydrology. Additionally, secondary wetland hydrology characteristics geomorphic position and FAC-neutral test was also met.

Hydrology will be established in the three wetland community zones: fresh wet meadow, shallow marsh, and open water. Hydrology is anticipated to be established according to the wetland community zone identified by the Army Corps of Engineers target hydrology standards:

> ***Fresh Wet Meadow****: Hydrology shall consist of a water table 12 inches or less below the soil surface for a minimum of 28 consecutive days, or two periods of 14 or more consecutive days, during the growing season under normal and wetter than normal hydrological conditions (per Sprecher and Warne 2000). Inundation during the growing season shall not occur except: (1) at the start of the growing season (due to snowmelt/precipitation); and (2) following the 10-year, 24-hour—or greater—precipitation events. Depth of inundation during the growing season shall be 6 inches or less with duration of less than 14 consecutive days. An exception can be made for sites with hummocky microtopography—hollows between hummocks can have standing water depths up to 6 inches for extended duration.*
>
> ***Shallow Marsh****: Hydrology shall consist of inundation up to 6 inches in depth for at least 28 consecutive days during the growing season under normal and wetter than normal hydrological conditions (per Sprecher and Warne 2000). During the growing season, inundation up to 18 inches in depth following the 2-year, 24-hour—or greater—precipitation events is permissible provided that the duration does not exceed 28 consecutive days (i.e., water depth drops from 18 inches to 6 inches within 28 days).*
>
> ***Shallow Open Water****: Hydrology shall consist of permanent to nearly permanent water depths of 48 to 80 inches.*

4. SEED MIXES, MATERIALS, & METHODS

4.1 Proposed Seed Mixes & Origin of Materials

The project would use state agency established state seed mixes that are described by Minnesota Department of Transportation (MnDOT) seed manual. The MnDOT seed mixes have been designed to increase diversity, create competition for invasive species, and promote plant community resiliency. Emergent wetland (34-181) and stormwater south and west (33-261) seed mixes were formulated for the purpose of establishing native plant communities and are the best fit for the plant communities that the project would support (see Appendix A for seed mixes). The mixes will be purchased through a native seed vendor. Individual species within the state seed mixes are subject to change based on availability at the time of purchase. If seeds of any species are not available they will be substituted with other comparable native species. Unavailability of species and their

substitutions will be documented. Upon delivery of seed, an invoice stating the total pounds of Pure Live Seed of each mix purchased and the total bulk weight will be collected. The seed will be stored in a cool dry place until it is delivered to the site on the day of planting.

4.2 Use of Temporary Cover Crop

A temporary cover crop of oats is included with native seed mixes and would suppress weed growth and reduce soil erosion. To prevent re-seeding, the temporary cover crop would be mowed to approximately 10-12 inches before seeds mature or would be harvested upon maturity. Cover crop residues would function as mulch. The thatch that remains after harvesting or mowing will help protect planted seedlings from wind and soil erosion.

If mulch is identified as necessary for upland seeded areas, a certified weed-free mulch may be applied at a rate of two tons per acre in the upland buffer. After spreading, the mulch would be disc-anchored so that the plant material is punched two to three inches into the soil at a spacing of approximately 12 inches. Hand methods of crimping would be used where equipment cannot operate.

Mulch should be used sparingly and only as needed to prevent erosion. Mulch may erode into wetland areas and prevent the germination wetland vegetation.

4.3 Seeding Methods

Seeding of all wetland plant mixes would be conducted by broadcast. Broadcast seeding would follow general guidelines described in the Minnesota Wetland Restoration Guide Technical Guidance Document:

> *the method of broadcast seeding would be conducted with Cyclone, Vicon, or other mechanical broadcast seeders or by hand broadcasting.*

Seeding would be delayed for several months after herbicide application to mitigate herbicide burn of seedlings.

5. VEGETATION MAINTENANCE

5.1 Identification of Probable Invasive Species

The site has been managed for turf grass and rough for decades; however, nonnative and invasive species may include clover, common plantain, dandelion, crabgrass, barnyard grass, common purslane, pigweed, Canada thistle, etc. Reed canary grass, hybrid cattail, European buckthorn, and Canada thistle has been identified in the vicinity of the restoration area and control methods are planned. Before planned vegetation becomes established, the site will be vulnerable to the spread of nonnative and invasive species.

5.2 Maintenance Methods

Encroachment of invasive and nonnative species in the wetland and the upland buffer would be managed as part of this maintenance plan. Control of any invasive species that move into the site would need to occur early in the restoration process to control their spread. Maintenance activities proposed for the site include mowing, herbicide application, and mechanical removal. Invasive and exotic species control methods are summarized below.

Treatment Timing	Treatment Approach	Herbicide Application
Mid-May – June	Mow NNI grass, then apply grass specific herbicide mixture, or suitable alternative.	Imazapyr and Glyphosate mixture, Garlon 4; Sethoxydim (VantageTM or PostTM), Quizolofop P-Ethyl (Assure II) or Clethodim (Select). Apply per label instructions with surfactant
July – Late June	Perform seeding	None
Mid-September – Late October	Flail mowing or haying. If NNI grass continues establishing amongst native sedges and forbs, spray with grass-specific herbicide as necessary to remove grass seedlings	Imazapyr and Glyphosate mixture, Sethoxydim (VantageTM or PostTM), Quizolofop P-Ethyl (Assure II) or Clethodim (Select). Apply per label instructions with surfactant
Mid-May – July **Year 2 and 3 as necessary**	Continue application of grass-specific herbicide if NNI grass is present	Imazapyr and Glyphosate mixture, Sethoxydim (VantageTM or PostTM), Quizolofop P-Ethyl (Assure II) or Clethodim (Select). Apply per label instructions with surfactant
Late August – Late September **Year 2 and 3 as necessary**	Flail mowing or haying	
Mid-September – Late October **Year 2 and 3 as necessary**	If NNI grass continues establishing amongst native sedges and forbs, spray with grass-specific herbicide as necessary to remove grass seedlings	Imazapyr and Glyphosate mixture, Sethoxydim (VantageTM or PostTM), Quizolofop P-Ethyl (Assure II) or Clethodim (Select). Apply per label instructions with surfactant

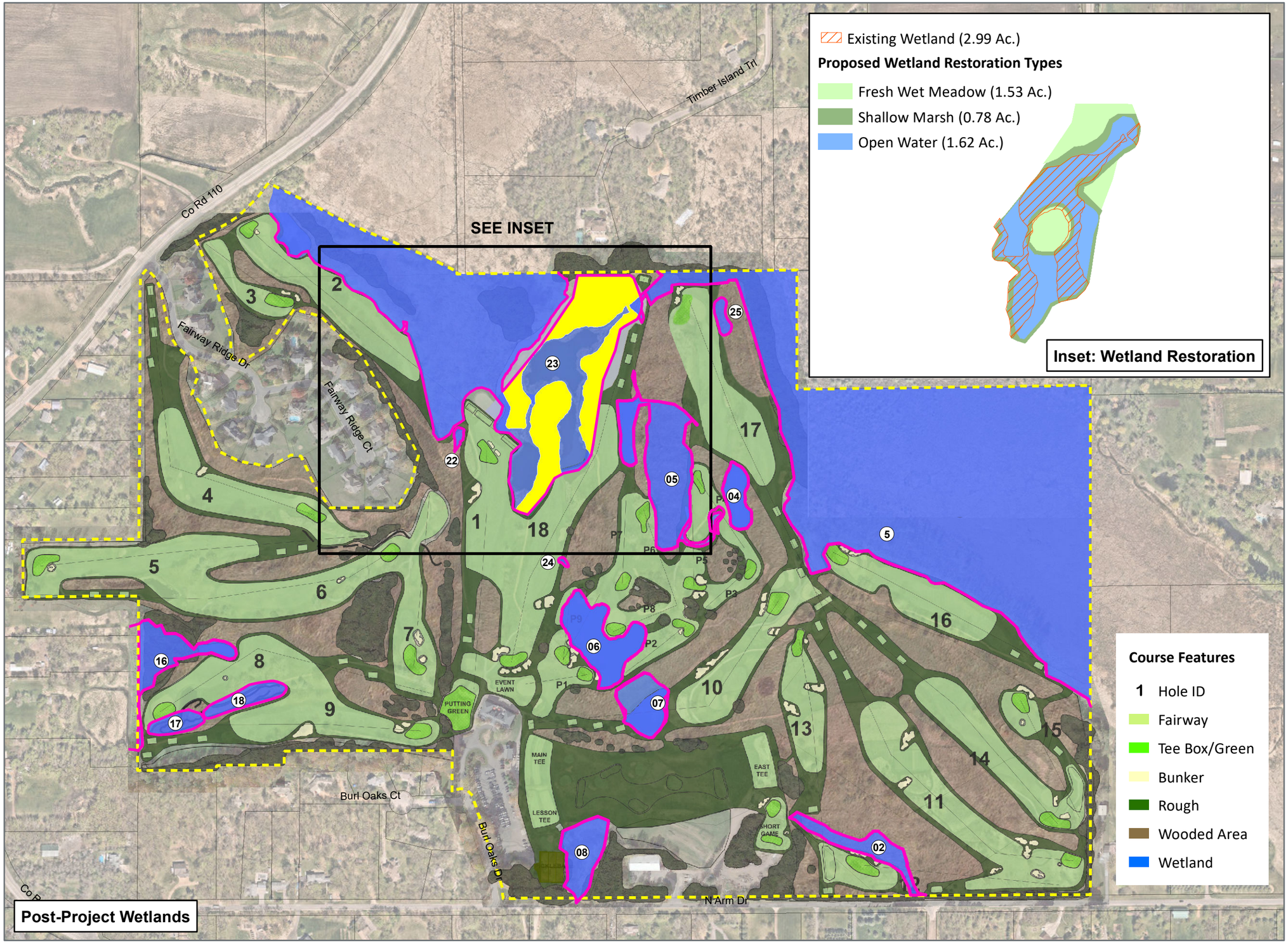
Note: Timing and recommendations would vary depending on site conditions. Follow label recommendations for herbicide additives and timing.

To help establish wetland plant communities and control for weedy species, wetlands should be mowed to a height of 6 to 8 inches every 30 days in the first year. Mowing in wetlands would occur between planting and September 30th and only if conditions are dry enough that equipment would not cause soil disturbance. The following year, mowing in wetlands would occur once with spot mowing in areas with prevalent weeds. In the following years, undesirable species in the wetlands would be monitored for and mechanically removed or spot sprayed with appropriate herbicides.

Figures

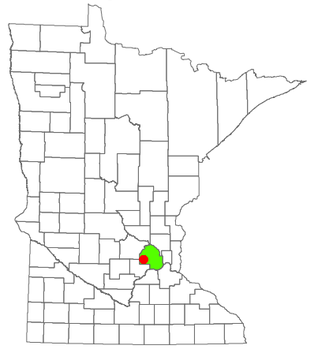
Burl Oaks Golf Club
Minnetrista, Minnesota

Figure 1
Post Project Wetlands and Wetland Restoration Area



Course Features
- 1 Hole ID
- Fairway
- Tee Box/Green
- Bunker
- Rough
- Wooded Area
- Wetland

Project Location



City of Minnetrista
Hennepin County, MN

Legend
- Burl Oaks Property (~198.8 Ac.)
- Hennepin Co. Parcels
- Wetland Restoration Area (3.93 Ac.)
- Post-Project Wetland Boundary
- ⑤ Aquatic Resource ID

Project Notes

Project No: 17652
Date: 2.18.2025

Sources: MnDNR, USDA, ESRI, TIGER, Bing, Hennepin Co., Anderson Engineering

1 inch = 400 feet

0 200 400 800
Feet

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13605 1st Ave N #100, Plymouth, MN 55441
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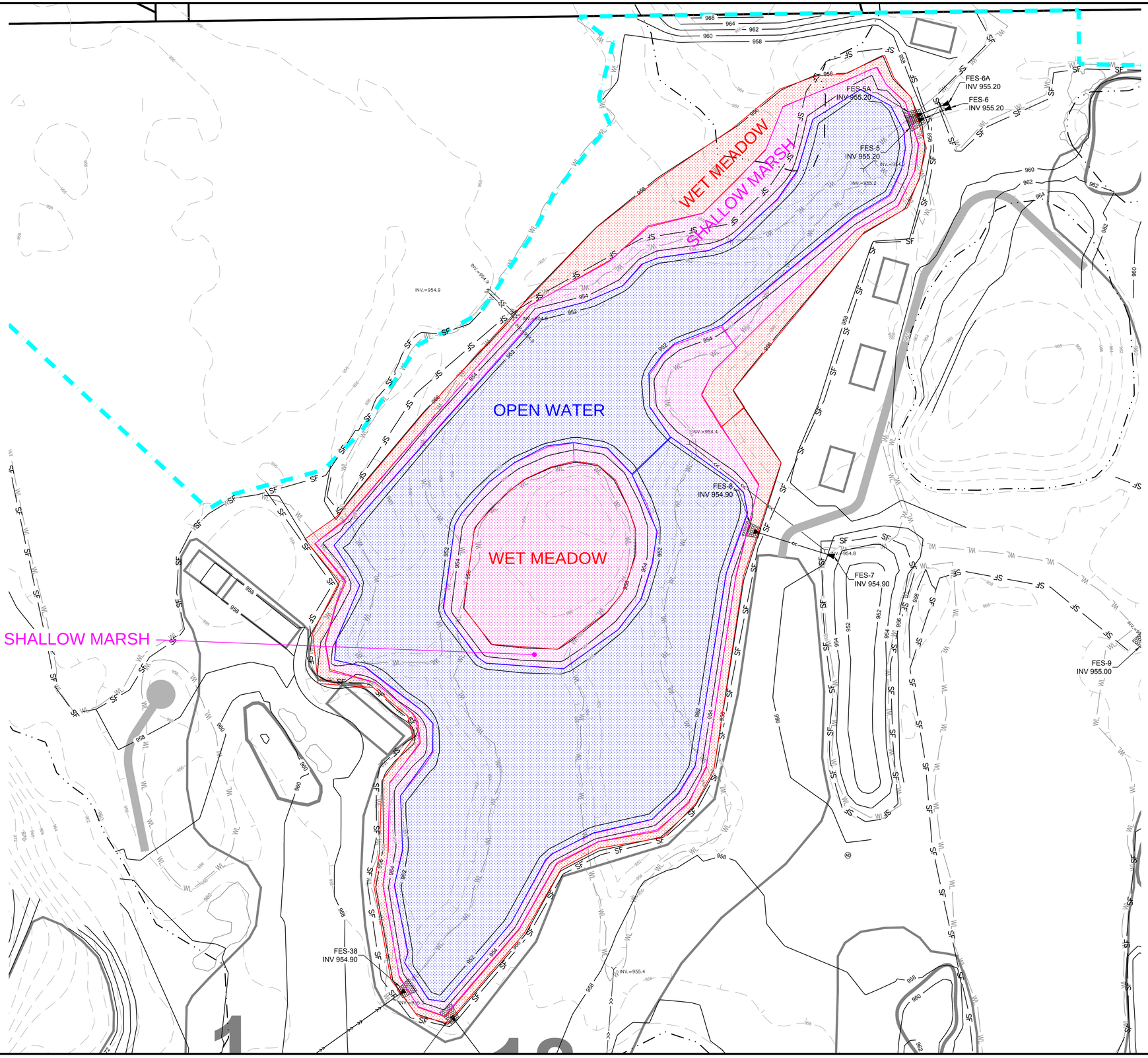
Document Path: C:\GIS\GIS\Projects\17600\17652 BURL OAKS - COURSE RENOVATION PROJECT\Permitting\17652_BOGC_MP_Fig1_RestorationAreas.mxd



LEGEND

- PROPERTY LIMITS
- CONSTRUCTION LIMITS
- EXISTING CONTOUR
- PROPOSED CONTOUR
- DRAINAGE ARROW
- REDUNDANT SILT FENCE
- INLET SEDIMENT PROTECTION
- ROCK CONSTRUCTION ENTRANCE
- PROPOSED SPOT ELEVATION
- BITUMINOUS PATHWAY
- EXISTING WETLAND
- FLOODPLAIN BOUNDARY
- COURSE FEATURE (GREEN, TEE, FAIRWAY)
- EXISTING STORM SEWER
- PROPOSED STORM SEWER

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Anderson Engineering of Minnesota, LLC

BURL OAKS - COURSE RENOVATION PROJECT

5400 N ARM DR
MINNETRISTA, MN 55364

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

PRINT NAME: ADAM THIELE, PE

SIGNATURE: ~~NOT FOR CONSTRUCTION~~

DATE: 01/16/2025 LICENSE NO. 51317

REVISION LOG

NO.	DATE	DESCRIPTION OF REVISIONS
1	02/09/25	REVISED PER MCWD COMMENT
2	02/18/25	REVISED WETLAND RESTORATION

MCWD PERMIT APPLICATION
01/16/2025

DESIGNED:	DRAWN:	CHECKED BY:
AT	JR	AT

DRAWING TITLE

WETLAND RESTORATION PLAN

DRAWING NO.

FIGURE 2

PLOTTED:	COMM. NO.
----	17652

Appendix A

MnRAM Functional Assessment – Proposed Wetland 23
Seed Mix 33-261 Stormwater South and West
Seed Mix 34-181 Emergent Wetland

	Date	Wetland 23 (proposed)		Wetland name / ID		Wetland name / ID		Wetland name / ID	
	Special Features (from list, p.2--enter letter/s)	-		-		-		-	
#1	Community Number (circle each community which represents at least 10% of the wetland)	3A, 3B, 4A, 4B, 7A, 7B, 8A, 8B, 10A, 13A, 13B, 12B, 14A, 15A, 15B, 16A, 16B		3A, 3B, 4A, 4B, 7A, 7B, 8A, 8B, 10A, 13A, 13B, 12B, 14A, 15A, 15B, 16A, 16B		3A, 3B, 4A, 4B, 7A, 7B, 8A, 8B, 10A, 13A, 13B, 12B, 14A, 15A, 15B, 16A, 16B		3A, 3B, 4A, 4B, 7A, 7B, 8A, 8B, 10A, 13A, 13B, 12B, 14A, 15A, 15B, 16A, 16B	
#2 & #3	~ Describe each community type individually below ~					~ Describe each community type individually below ~			
Plant Community #1	Community Type (wet meadow, marsh)	15B	Fresh(wet) Meadow	-	-	-	-	-	-
	Community Proportion (% of total)	39%							
	Dominant Vegetation / Cover Class								
	Invasive/exotic Vegetation / Cover Class								
	Community Quality (E, H, M, L)	h	1		0		0		0
Plant Community #2	Community Type (wet meadow, marsh)	13B	Shallow Marsh	-	-	-	-	-	-
	Community Proportion (% of total)	20%							
	Dominant Vegetation / Cover Class								
	Invasive/exotic Vegetation / Cover Class								
	Community Quality (E, H, M, L)	h	1		0		0		0
Plant Community #3	Community Type (wet meadow, marsh)	16A	Shallow, Open Water	-	-	-	-	-	-
	Community Proportion (% of total)	41%							
	Dominant Vegetation / Cover Class	None							
	Invasive/exotic Vegetation / Cover Class								
	Community Quality (E, H, M, L)	L	0.1		0		0		0
Plant Community #4*	Community Type (wet meadow, marsh)	-	-	-	-	-	-	-	-
	Community Proportion (% of total)								
	Dominant Vegetation / Cover Class								
	Invasive/exotic Vegetation / Cover Class								
	Community Quality (E, H, M, L)	-	0		0		0		0
	Circular 39 Types (primary <TAB> others)								
	Cowardin Types								
	Photo ID								
Highest rated community veg. div./integ:		1.0	High	0	-	0	-	0	-
Average vegetative diversity/integrity:		0.70	High	-	-	-	-	-	-
Weighted Average veg. diversity/integrity:		0.63	Medium	0.00	-	0.00	-	0.00	-
#4	Listed, rare, special plant species?	n	Y N		Y N		Y N		Y N
#5	**Rare community or habitat?**	**n**	**Y N**		**Y N**		**Y N**		**Y N**
#6	Pre-European-settlement conditions?	n	Y N		Y N		Y N		Y N

Floodplain Forest [1A, 2A, 3A] * Hardwood Swamp [3B] * Coniferous Bog [2A, 4B] * Coniferous Swamp [4B] * Open Bog [1B, 5A, 5B, 6A, 7A, 9A, 10A] * Calcareous Fen [7B, 11B, 14A] * Shrub Swamp [6B] * Alder Thicket [8A] * Shrub-carr [8B] * Sedge Meadow [10B, 11A, 12A, 13A] * Shallow Marsh [13B] * Deep Marsh [12B] * Wet to Wet-Mesic Prairie [14B, 15A] * Fresh (Wet) Meadow [15B] * Shallow, Open Water [9B, 16A] * Seasonally Flooded Basin [16B]

*If there are more than four plant community types, use the next column over to enter the rest and do not rely on the automatic average calculations.

Cover Class	Class Range
1	0 - 3%
2	3 - 10%
3	10 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

MnRAM 3.2 Digital Worksheet, Side 2

		Question Description	User entry	Rating										
													Highest-rated:	
	1	Veg. Table 2, Option 4		0.63									1	
		TOTAL VEG Rating	0.631	Medium										
	4	Listed, rare, special plant species?	n	next										
	5	Rare community or habitat?	n	next										
	6	Pre-European-settlement conditions?	n	next										
	7	hydrogeo & topo		#N/A										
	8	Water depth (inches)												
		Water depth (% inundation)												
	9	Local watershed/immedita drainage (acres)												
	10	Existing wetland size	2.99											
	11	SOILS: Up/Wetland (survey classification + site)												
Digital worksheet, section I	12	Outlet characteristics for flood retention	B	0.5										
	13	Outlet characteristics for hydrologic regime	A	1										
	14	Dominant upland land use (within 500 ft)	A	1	0.1									
	15	Soil condition (wetland)	A	1										
	16	Vegetation (% cover)	50%	M	0.5									
	17	Emerg. veg. flood resistance	B	0.5										
	18	Sediment delivery	A	1										
	19	Upland soils (based on soil group)	C	1										
	20	Stormwater runoff pretreatment & detention	B	0.5	0.5									
	21	Subwatershed wetland density	B	0.5										
	22	Channels/sheet flow	A	1										
	23	Adjacent naturalized buffer average width (feet)	30	M	WQ	0.5	L		0.1					
	24	Adjacent Area Management: % Full	0%	0	1	**0.5**								
		adjacent area mgmt: % Manicured	100%	0.5										
		adjacent area mgmt: % Bare	0%	0										
	25	Adjacent Area Diversity & Structure: % Native	0%	0	2	**0.505**								
		adjacent area diversity: % Mixed	100%	0.5										
		adjacent area diversity: % Sparse/Inv./Exotic	5%	0.005										
	26	Adjacent Area Slope: % Gentle	100%	1	1	**1**								
		adjacent area slope: % Moderate		0										
		adjacent area slope: % Steep		0										
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1										
	28	Nutrient loading	B	0.5										
	29	Shoreline wetland?	N	N										
	30	Rooted shoreline vegetation (%cover)		Enter a percentage										
	31	Wetland in-water width (in feet, average)		Enter a percentage										
	32	Emergent vegetation erosion resistance		Enter valid choice										
	33	Shoreline erosion potential		Enter valid cho										
	34	Bank protection/upslope veg.		Enter valid choice										
	35	Rare Wildlife	N	N										
	36	Scarce/Rare/S1/S2 local community	N	N										
	37	Vegetation interspersion cover (see diagram 1)	5	H	1									
	38	Community interspersion (see diagram 2)	2	M	0.5						0			
	39	Wetland detritus	A	1										
	40	Wetland interspersion on landscape	A	1	1									
	41	Wildlife barriers	A	1										
	42	Amphibian breeding potential-hydroperiod	A	1										
	43	Amphibian breeding potential--fish presence	A	1										
	44	Amphibian & reptile overwintering habitat	B	0.5										
	45	Wildlife species (list)												
	46	Fish habitat quality	N/A	N/A										
	47	Fish species (list)												
	48	Unique/rare educ./cultural/rec.opportunity	N	N										
	49	Wetland visibility	C	0.1										
	50	Proximity to population	N	0.1										
	51	Public ownership	C	0.1										
	52	Public access	C	0.1										
	53	Human influence on wetland	B	0.5										
	54	Human influence on viewshed	A	1										
	55	Spatial buffer	A	1										

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P
68		56	Recreational activity potential	C	0.1										
69		57	Commercial crop--hydrologic impact	N/A	N/A										
70															

Additional questions

58	*GW - Wetland soils*	D	R or D	1	
59	*GW - Subwatershed land use*	D	R or D	1	
60	*GW - Wetland size and soil group*	R	R or D	0.1	
61	GW - Wetland hydroperiod	D	R or D	1	
62	GW - Inlet/Outlet configuration	R	R or D	0.1	
63	GW - Surrounding upland topographic relief	D	R or D	1	
64	Restoration potential w/o flooding	N	Y or N	4.2	
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice	
66A	*Existing wetland size (acres) [from #10]*	2.99	__ acres		
66B	Total wetland restoration size (acres)		__ acres	0.1	
66C	(Calculated) Potential New Wetland Area [B-A]	-2.99	__ acres	% effectively drained: ####	
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1	value: ####
68	Likelihood of restoration success		a b c	Enter valid choice	
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling		
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8		
71	Wetland sensitivity to stormwater	a	E a b c		
72	Additional stormwater treatment needs	a	a b c		

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category	Formula shown to the right.
Vegetative Diversity/Integrity		0.63	Med	
Hydrology - Characteristic		0.88	High	
Flood Attenuation		0.64	Med	
Water Quality--Downstream		0.74	High	
Water Quality--Wetland		0.70	High	
Shoreline Protection		N/A	N/A	
Characteristic Wildlife Habitat Structure	0.76	0.76	High	Manage 1
Maintenance of Characteristic Fish Habitat	######	N/A	N/A	
Maintenance of Characteristic Amphibian Habitat		0.53	Med	Manage 1
Aesthetics/Recreation/Education/Cultural	0.38	0.38	Med	
Commercial use		N/A	N/A	0

Special Features listing: -

Groundwater Interaction	discharge	
Groundwater Functional Index		no special indicators
Restoration Potential (draft formula)	N/A	N/A
Stormwater Sensitivity (not active)		

33-261 Stormwater South & West

Common Name	Scientific Name	Rate (lb/ac)	Rate (kg/ha)	% of Mix (by weight)	Seeds/ sq ft
big bluestem	*Andropogon gerardii*	2.00	2.24	5.72%	7.35
fringed brome	*Bromus ciliatus*	2.00	2.24	5.73%	8.10
Virginia wild rye	*Elymus virginicus*	1.50	1.68	4.28%	2.31
fowl bluegrass	*Poa palustris*	1.06	1.19	3.03%	50.70
slender wheatgrass	*Elymus trachycaulus*	1.00	1.12	2.85%	2.53
switchgrass	*Panicum virgatum*	0.38	0.43	1.07%	1.93
prairie cordgrass	*Spartina pectinata*	0.38	0.43	1.07%	0.91
Indian grass	*Sorghastrum nutans*	0.12	0.13	0.36%	0.55
bluejoint	*Calamagrostis canadensis*	0.06	0.07	0.18%	6.40
	Grasses Subtotal	**8.50**	**9.53**	**24.29%**	**80.78**
awl-fruited sedge	*Carex stipata*	0.25	0.28	0.71%	3.10
dark green bulrush	*Scirpus atrovirens*	0.19	0.21	0.54%	31.70
woolgrass	*Scirpus cyperinus*	0.06	0.07	0.18%	39.00
	Sedges & Rushes Subtotal	**0.50**	**0.56**	**1.43%**	**73.80**
golden alexanders	*Zizia aurea*	0.20	0.22	0.56%	0.79
autumn sneezeweed	*Helenium autumnale*	0.13	0.15	0.36%	5.97
marsh milkweed	*Asclepias incarnata*	0.11	0.12	0.32%	0.20
leafy beggarticks	*Bidens frondosa*	0.11	0.12	0.31%	0.20
Canada anemone	*Anemone canadensis*	0.07	0.08	0.19%	0.20
obedient plant	*Physostegia virginiana*	0.07	0.08	0.21%	0.30
tall coneflower	*Rudbeckia laciniata*	0.07	0.08	0.21%	0.37
New England aster	*Symphyotrichum novae-angliae*	0.07	0.08	0.19%	1.56
flat-topped aster	*Doellingeria umbellata*	0.06	0.07	0.17%	1.50
spotted Joe pye weed	*Eutrochium maculatum*	0.06	0.07	0.18%	2.19
blue vervain	*Verbena hastata*	0.05	0.06	0.15%	1.85
	Forbs Subtotal	**1.00**	**1.12**	**2.85%**	**15.13**
Oats	*Avena sativa*	25.00	28.02	71.43%	11.14
	Cover Crop Subtotal	**25.00**	**28.02**	**71.43%**	**11.14**
	Total	**35.00**	**39.23**	**100.00%**	**180.85**
Purpose:	Stormwater pond edges, temporarily flooded dry ponds, and temporarily flooded ditch bottoms.				
Planting Area:	Tallgrass Aspen Parklands, Prairie Parkland, and Eastern Broadleaf Forest Provinces. Mn/DOT Districts 2(west), 3B, 4, Metro, 6, 7 & 8.				

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34-181 Emergent Wetland

Common Name	Scientific Name	Rate (lb/ac)	Rate (kg/ha)	% of Mix (by weight)	Seeds/ sq ft
American slough grass	*Beckmannia syzigachne*	0.70	0.78	14.07%	12.92
rice cut grass	*Leersia oryzoides*	0.30	0.34	5.93%	3.70
tall manna grass	*Glyceria grandis*	0.25	0.28	4.98%	6.40
	Grasses Subtotal	**1.25**	**1.40**	**24.98%**	**23.02**
river bulrush	*Bolboschoenus fluviatilis*	0.76	0.85	15.20%	1.20
soft stem bulrush	*Schoenoplectus tabernaemontani*	0.44	0.49	8.78%	5.00
Three-square bulrush	*Schoenoplectus pungens*	0.23	0.26	4.54%	1.00
bristly sedge	*Carex comosa*	0.18	0.20	3.63%	2.00
least spikerush	*Eleocharis acicularis*	0.10	0.11	1.94%	2.50
marsh spikerush	*Eleocharis palustris*	0.10	0.11	2.03%	1.90
lake sedge	*Carex lacustris*	0.06	0.07	1.19%	0.24
woolgrass	*Scirpus cyperinus*	0.05	0.06	1.02%	32.00
tussock sedge	*Carex stricta*	0.04	0.04	0.77%	0.75
Torrey's rush	*Juncus torreyi*	0.04	0.04	0.85%	25.00
	Sedges & Rushes Subtotal	**2.00**	**2.24**	**39.95%**	**71.59**
giant bur reed	*Sparganium eurycarpum*	0.49	0.55	9.80%	0.09
common water plantain	*Alisma triviale*	0.40	0.45	8.00%	9.70
broad-leaved arrowhead	*Sagittaria latifolia*	0.30	0.34	6.07%	6.80
Sweet flag	*Acorus americanus*	0.28	0.31	5.53%	0.67
marsh milkweed	*Asclepias incarnata*	0.28	0.31	5.67%	0.50
	Forbs Subtotal	**1.75**	**1.96**	**35.07%**	**17.76**
	Total	**5.00**	**5.60**	**100.00%**	**112.37**
Purpose:	Emergent wetland restoration for use in wetland mitigation, shoreline restoration, wet stormwater ponds where emergent vegetation is desired.				
Planting Area:	Statewide				

Back to seed mix index

moore engineering, inc.

Two Carlson Parkway, Ste 110, Plymouth, MN
55447
P: 612.355.7726

Memorandum

Date: February 21, 2025

Prepared By: Wes Boll, Moore Engineering, Inc.

Subject: MCWD
Burl Oaks Golf Course Wetland Buffer Exception – Wetland Restoration Plan Review

Minnehaha Creek Watershed District (MCWD) requested Moore staff review of a wetland restoration plan submitted by an Applicant. The restoration plan is intended to provide offset of lost wetland functions from inadequate wetland buffers on the Burl Oaks golf course in the City of Minnetrista, It is our understanding that the Applicant has applied for an exception to the MCWD buffer rule, and proposes that the wetland functions provided by the proposed wetland restoration would offset the functions that would be lost on the site by not having adequate buffers on existing wetlands elsewhere on the site.

After initial review of information submitted by the Applicant and correspondence with the project consultant (Anderson Engineering) and MCWD staff, a review of the restoration suitability and potential additional information needs was provided. Anderson Engineering submitted the Wetland 23 Restoration Burl Oaks Golf Club ("Restoration Plan") document that provided additional details and addressed initial comments.

This technical memo is prepared to document that the Restoration Plan addresses initial comments and provides a feasible alternative for wetland restoration on the site.

Wetland Restoration Plan Review

The Restoration Plan proposes to restore 3.93 acres of filled historic wetland adjacent to an existing Type 5-Open Water Wetland identified as Wetland 23 in the wetland delineation report. The proposed plan would remove fill material that was placed over organic soils during the construction of the golf course and establish wetlands with different bottom elevations to result in varying hydrology regimes and wetland vegetation communities. The proposed plan would result in the restoration of multiple wetland types (Type 2-Fresh Wet Meadow, Type 3-Shallow Marsh, Type 5-Open Water). Proposed grading contours for the wetland restoration are shown in Figure 2 of the Plan.

The Restoration Plan documents that areas intended to be Type 2 wetland would be graded to approximately 955 ft to 956 ft, similar to the elevation of the adjacent wetland area to the north and west, and would be approximately 1 ft higher than the Normal Water Level (NWL) of the Type 5 wetland. Type 2 wetlands commonly occur at elevations slightly higher than the NWL of wetland basins. The grading plan indicates that restored Shallow Marsh areas would establish as a vegetated fringe of the Type 5 wetland in areas below 955 ft to 953 ft in elevation. The Restoration Plan also documents the presence of an existing water table near the proposed wetland elevations, based on site investigations.

Based on the review of existing conditions as summarized in the Restoration Plan, there appears to be a sufficient hydrology source to support wetlands. The strategy to restore wetland hydrology and vegetation communities to the proposed elevations is reasonable.

Based on review of information in the Restoration Plan, the area where the wetland restoration is proposed is mapped as containing hydric soil series (Muskego, Blue Earth, Houghton) comprised of organic materials (muck, peat) that would have likely supported wetland conditions similar to those observed in adjacent unfilled wetlands. Review of the site investigation information indicates organic soils (peat/loam) are present in adjacent unfilled wetland. The Restoration Plan documents that up to 4 feet of fill was placed over wetland areas during the construction of the golf course. Based on the review of soil survey and existing site conditions it appears that the proposed restoration would occur in an area where soils would be suitable to support restored wetlands.

The Restoration Plan documents that state seed mixes comprised of native species that are commonly used during restoration projects would be seeded on the site. Different seed mixes would be applied in the vegetation communities, based on anticipated hydrologic conditions and proposed vegetation community type. A vegetation maintenance plan is also included, and identifies a strategy to use management techniques such as mowing and herbicide application to control the spread of invasive species and maintain a native dominated community. The establishment of a wetland with multiple vegetation communities comprised predominantly of native species will increase wetland functions provided by the restoration project. The restored wetland areas should be suitable for the establishment of native vegetation communities, as proposed.

Overall, based on our understanding of the proposed plan and site conditions, the Restoration Plan provides a feasible strategy to restore wetland hydrology and vegetation communities. The Restoration Plan documents that suitable conditions are present for restoration and also provides a detailed plan for the restoration activities. The Restoration Plan also addresses previous comments and recommendations for additional information.

Wetland Functions Assessment

The Restoration Plan also quantifies the functional improvement that would be provided by the proposed restored wetland, using MnRAM to assess wetland funcitons. The proposed plan to restore multiple wetland types with native vegetation communities, with irregular interspersion of vegetation community boundaries and varying water depths is an optimal design to maximize wetland functions (as opposed to a single wetland type with little vegetation or non-native vegetation). The Restoration Plan confirms that the proposed restoration would result in an increase of most wetland functions and elevate the MnRAM management classification of the wetland. This would also serve to offset the lost functions from the inadequate buffers on existing wetlands on the site.

Burl Oaks Golf Club - Irrigation System Comparison

Pump Station:

- Old System: Two 40hp pumps with a 15hp jockey pump, limited pressure and flow capacity.
- New System: Upgraded to two 75hp pumps with a 5hp jockey pump, delivering 1500 gallons per minute at 125 psi. This ensures better coverage, faster cycles, and higher efficiency during peak demand.

Sprinkler Layout:

- Old System: Single-row design. Limited ability to adjust for varying turf and soil needs, leading to inconsistent coverage, especially in rough areas.
- New System: Triple-row design for fairways and roughs, significantly enhancing uniform water distribution. Improved coverage reduces dry spots and overwatering.

Control System:

- Old System: Block-style control, where multiple heads operate simultaneously, limiting precision and flexibility. Adjustments required manual effort.
- New System: Individual head control for all 1,200 sprinklers. This allows precise irrigation based on microclimates, reducing water waste and improving turf health.

Coverage and Efficiency:

- Old System: Inconsistent coverage with overlap issues on greens, tees, and fairways.
- New System: Ins and outs' design for greens and surrounds ensures targeted watering, minimizing runoff and promoting deeper root growth.

Water Conservation and Turf Health:

- Old System: Higher water usage due to inefficiencies, with dry spots requiring manual adjustments.
- New System: Optimized scheduling and zoning reduce water consumption. Individual control helps fine-tune irrigation to specific turf needs, enhancing playability and aesthetics.

Nathan Peters
Golf Course Superintendent
Burl Oaks Golf Club
2/4/2025

Burl Oaks Golf Club
Renovation Comparison

Fertilizer Use (lbs per 1,000 sq ft)			
Area	***Current Fertilizer***	***Future Fertilizer***	***% Change***
Greens	1.75#/m	1.31–1.40#/m	-20% to -25%
Tees	1.8#/m	1.35–1.44#/m	-20% to -25%
Fairways	1.75#/m	1.31–1.40#/m	-20% to -25%
Rough	3#/m	3#/m	0%

Pesticide Use (applications per year)			
Area	***Current Pesticides***	***Future Pesticides***	***% Change***
Greens	10 apps/year	4–6 apps/year	-40% to -60%
Tees	8 apps/year	3–5 apps/year	-40% to -60%
Fairways	8 apps/year	3–5 apps/year	-40% to -60%
Rough	0 apps/year	0 apps/year	0%

Water Use (gallons per year)			
Area	***Current Water Use***	***Future Water Use***	***% Change***
Greens	500,000 gallons	350,000 - 400,000 gallons	-20% to -30%
Tees	1,750,000 gallons	1,225,000 - 1,400,000 gallons	-20% to -30%
Fairways	10,500,000 gallons	7,350,000 - 8,400,000 gallons	-20% to -30%
Rough	3,250,000 gallons	2,275,000 - 2,600,000 gallons	-20% to -30%
Native Grass	1,500,000 gallons	0 gallons	-100%
Total Water Use	17,500,000 gallons	11,200,000 - 12,800,000 gallons	-29% to -41%

Fertilizer Use:
Fertilizer applications will see substantial reductions. This promotes healthier turf with fewer inputs, reducing both costs and the risk of nutrient runoff.

Pesticide Use:
By using improved bentgrass varieties like 007XL, which offer better disease resistance, we expect to reduce pesticide applications. Healthier turf from optimized growing conditions also means fewer pest and disease issues overall.

Water Usage:
The new irrigation system, with individual head control and improved coverage, will allow us to water more precisely. This means less waste, better moisture management, and healthier playing surfaces, even during a drought.

Nathan Peters
Golf Course Superintendent
Burl Oaks Golf Club
2/4/2025