

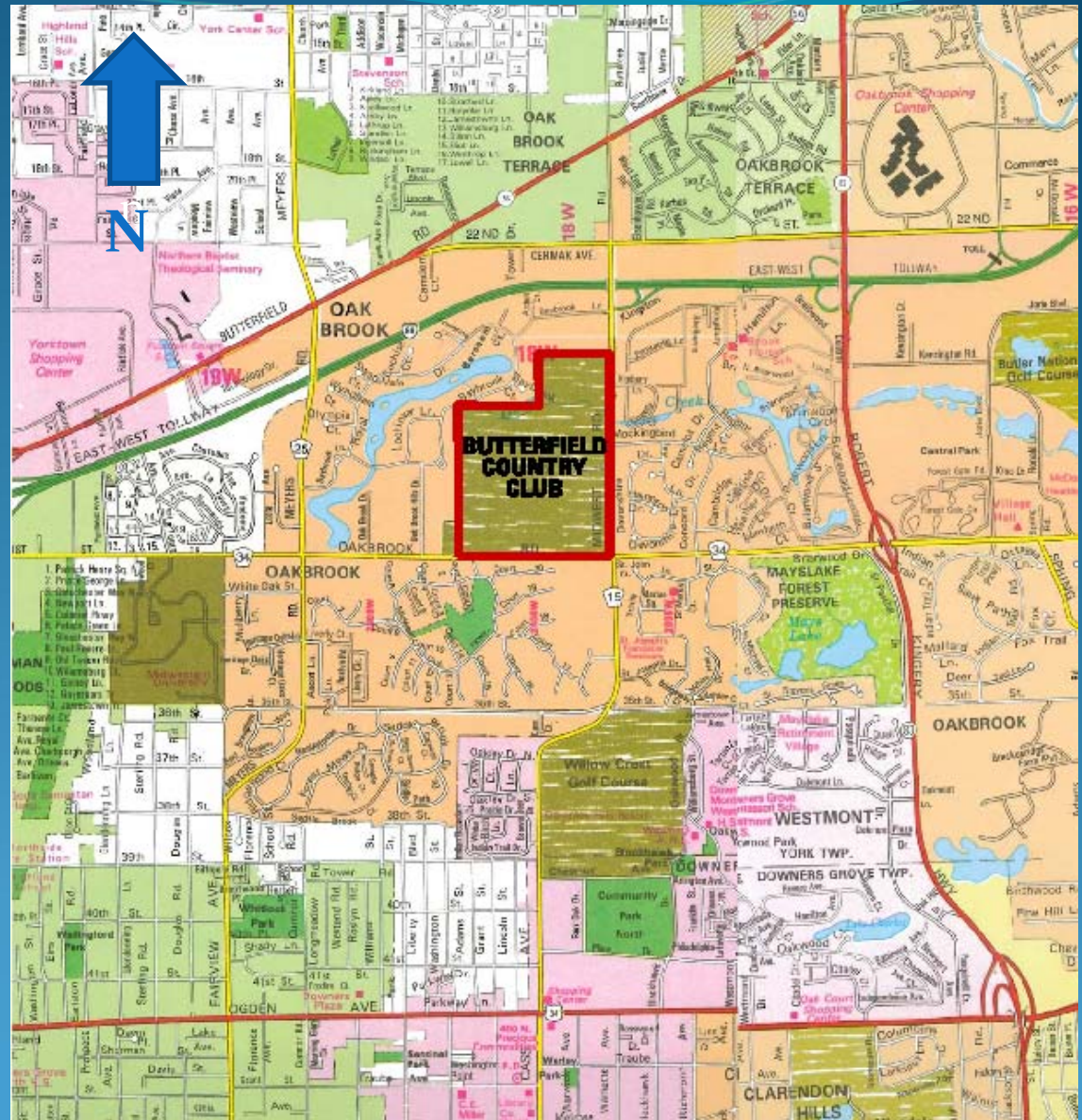
Butterfield Country Club Stream Restoration Project

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Michael D. Cothard, PE, CFM
Donald R. Dressel, PE, CFM
Casey D. Perry

Project Location

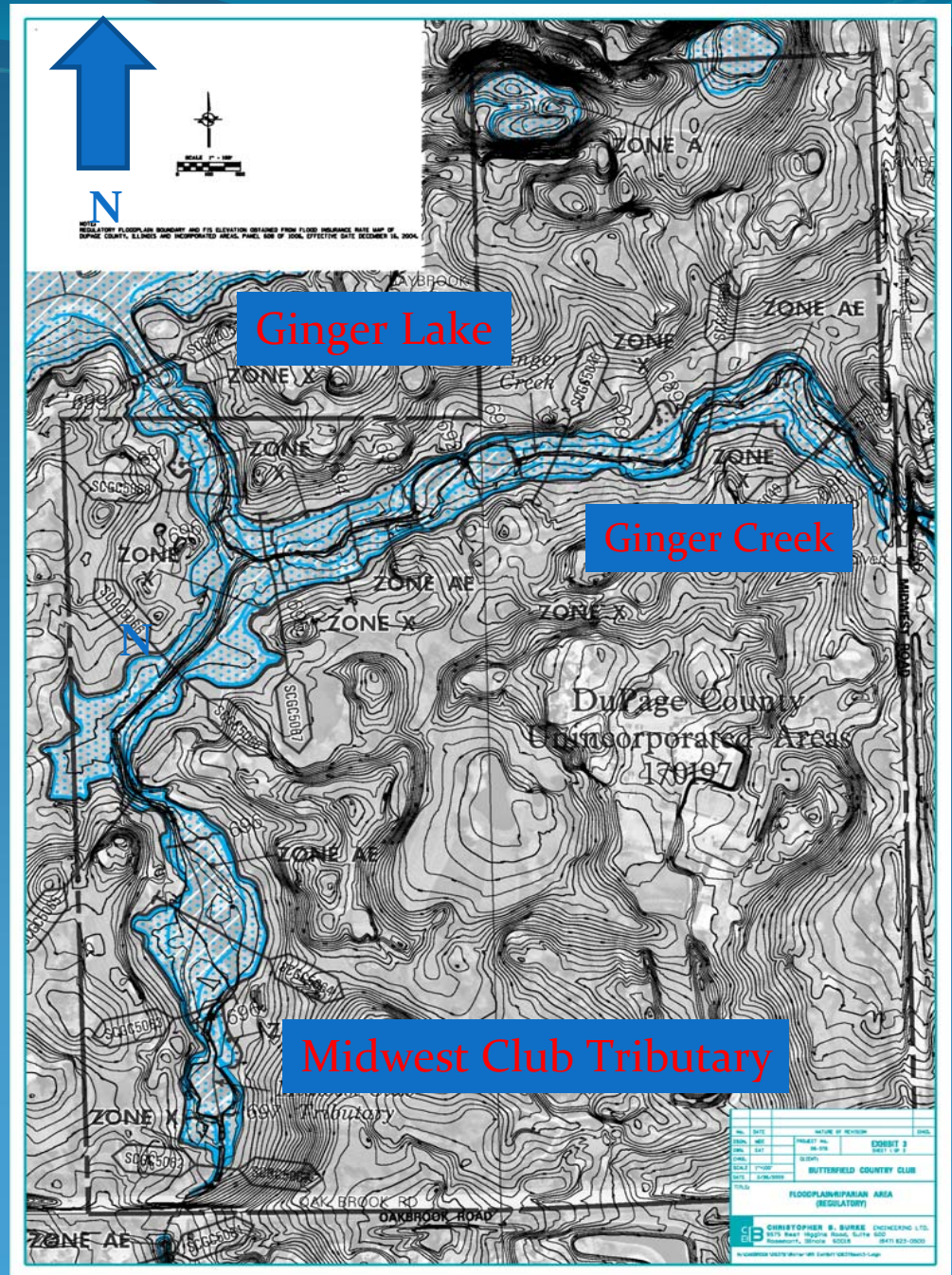
The Butterfield Country Club is –

- 36-hole Private Country Club
- Unincorporated DuPage County
- Surrounded by the Village of Oak Brook
- Northwest of the Midwest Road and 31st Street Intersection
- North of Ogden Avenue
- South of Butterfield Road
- West of Kingery Highway (Rte 83)



Ginger Creek and Midwest Club Tributary

- Ginger Creek flows through Ginger Lake
 - Crosses under Baybrook Lane
 - Enters the property from the north
 - Tributary area of 2 mi²
 - Combines with the Midwest Club Tributary
 - Continues east to Midwest Road
-
- Midwest Club Tributary crosses 31st Street
 - Enters the property from the south
 - Tributary area of 0.9 mi²
 - Combines with Ginger Creek in the northwest corner of the property



Site Issues

- Stream bank Erosion

Eroding banks are undercutting bridge abutments and removing fairways

- Overall Poor Course Drainage

Drainage system has had minimal up grading, thus resulting in difficult golf course maintenance

Areas which drain poorly or not at all



Project Responsibilities

- CBBEL

Stream Restoration, Drainage Improvements, Engineering plans and Permitting

- Steve Smyers Golf Course Architects

Master Plan for Golf Course Renovations

Fairway Erosion Within the course



Channel Meander Erosion



A photograph of a stream with a large tree and bush undercut on the bank. The stream is in the foreground, with dark water reflecting the surrounding greenery. On the right bank, a large, leafy bush is leaning over the water, its base exposed by an undercut. A white PVC pipe is visible on the right bank. In the background, a grassy area with a fence and a building is visible.

Tree and Bush Undercut





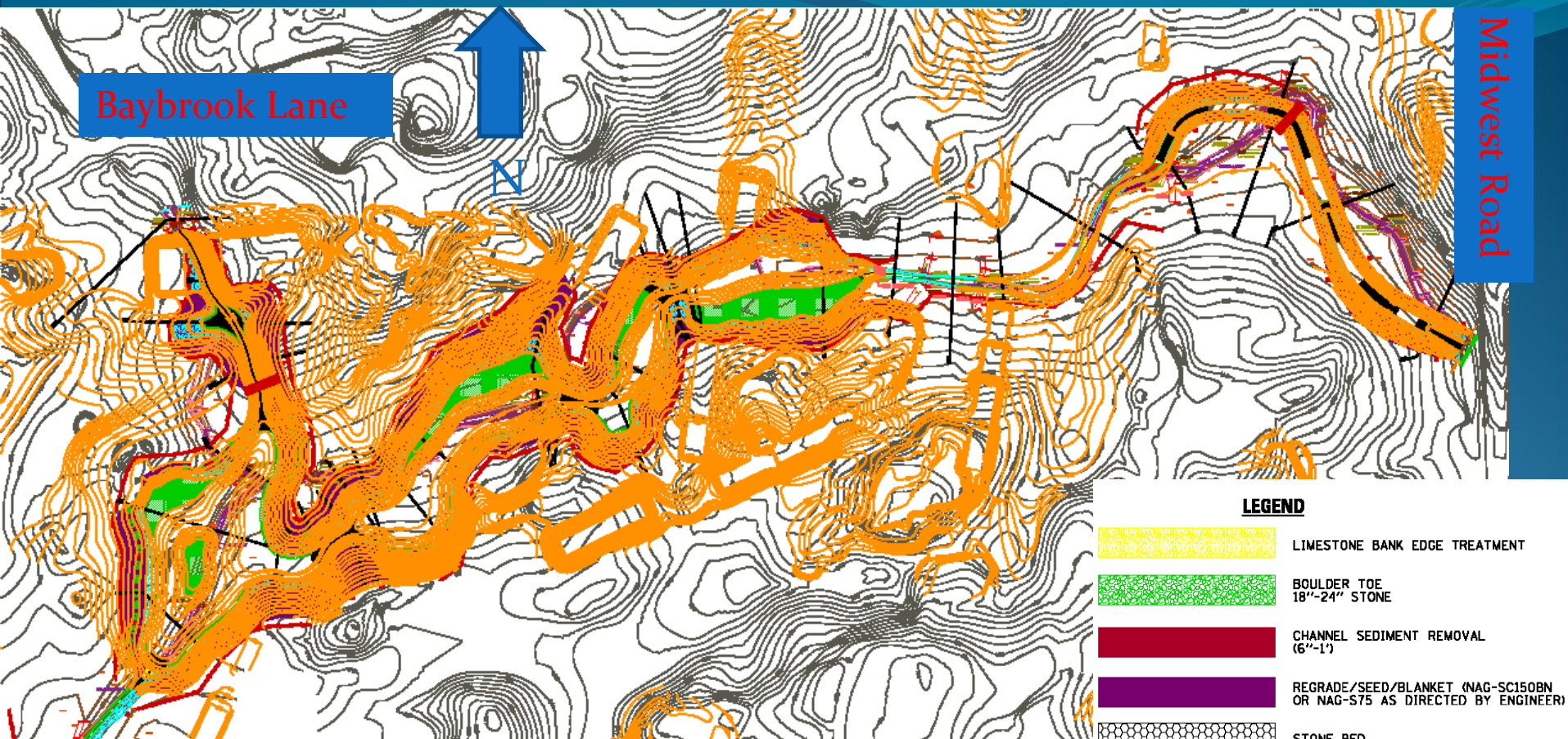


DuPage County

Watershed Plan - 1991

The recommended Capital Improvement Plan included the following projects within Butterfield Country Club:

- Relocate and lower the Ginger Creek reach entering Butterfield Country Club
- Straighten Ginger Creek upstream of the replaced Midwest Road culvert crossing



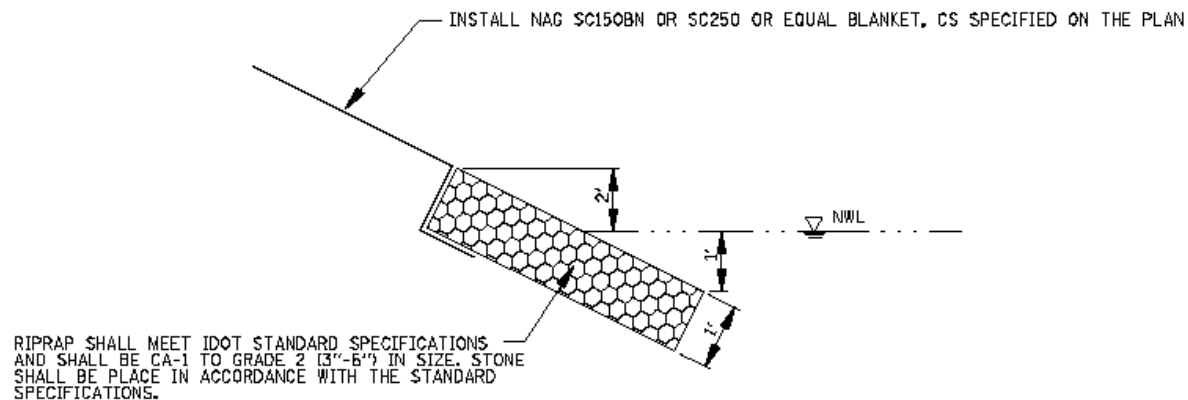
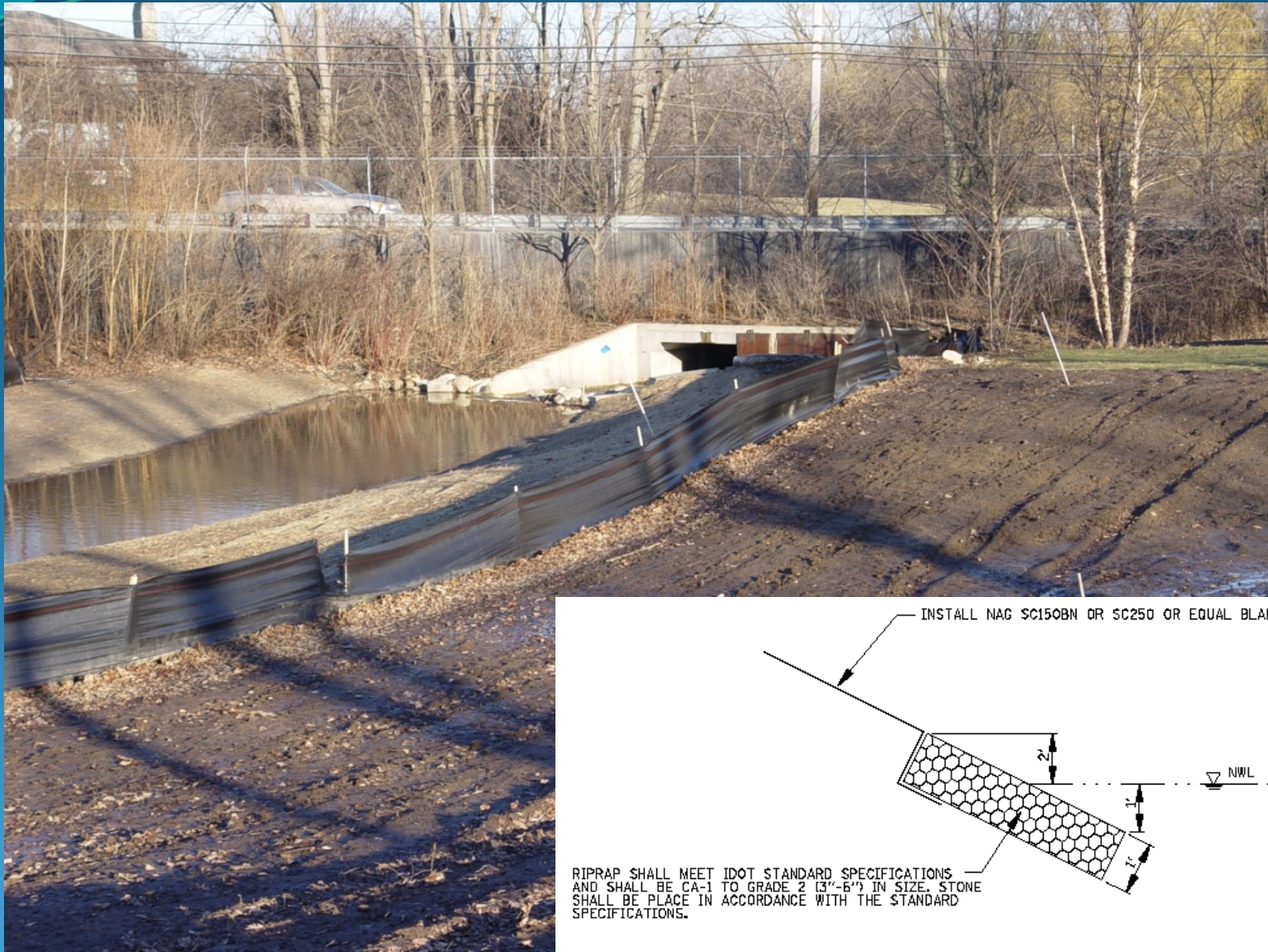
LEGEND

	LIMESTONE BANK EDGE TREATMENT
	BOULDER TOE 18"-24" STONE
	CHANNEL SEDIMENT REMOVAL (6"-1')
	REGRADE/SEED/BLANKET (NAG-SC150BN OR NAG-S75 AS DIRECTED BY ENGINEER)
	STONE BED
	WET MESIC PRAIRIE MIX
	EMERGENT PLUGS
	EXCAVATE 1.0'-1.5' OF SEDIMENT TO CREATE IN STREAM POOL
	EXCAVATE 1.5'-2.5' OF SEDIMENT TO CREATE IN STREAM POOL
	TRANSVERSE SILL
	ROCK VORTEX WEIR
	DOUBLE ROW OF SILT FENCE
	SINGLE ROW SILT FENCE
	TREE (TO BE CHOSEN FROM LIST ON SHEET 5)
	NATURAL AREA SIGN

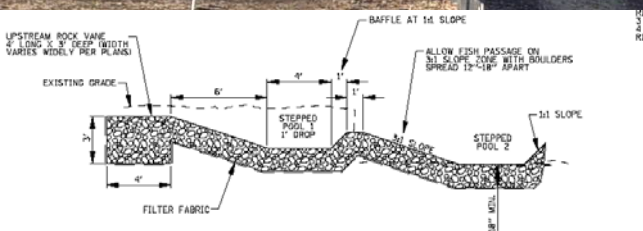
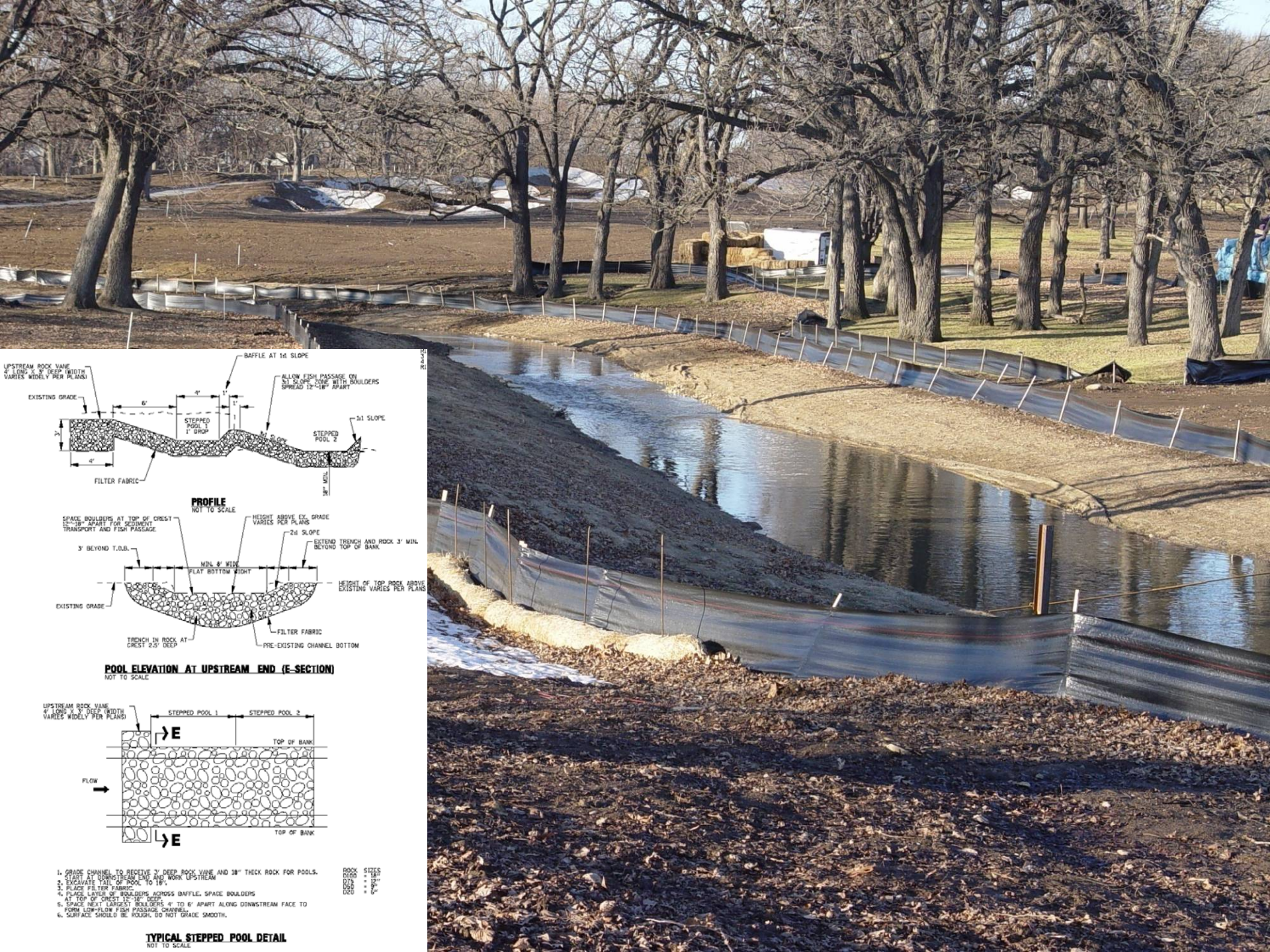
The stream restoration consisted of –

- Relocation of the western and eastern portion of Ginger Creek
- Reinforcement of the stream meanders
- Creation of ponds/Littoral Shelves
- Decreasing the hydraulic grade line and associated velocity
- Increasing floodplain storage volumes

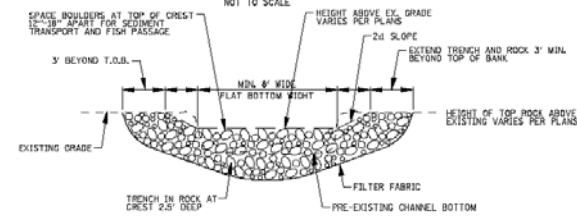
Ginger Creek East Relocation



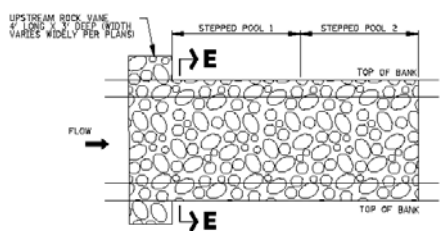
RIPRAP DETAIL
NOT TO SCALE



PROFILE
NOT TO SCALE



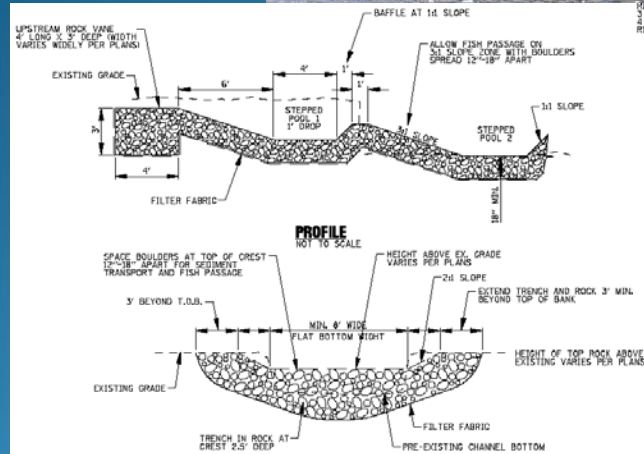
POOL ELEVATION AT UPSTREAM END (E-SECTION)
NOT TO SCALE



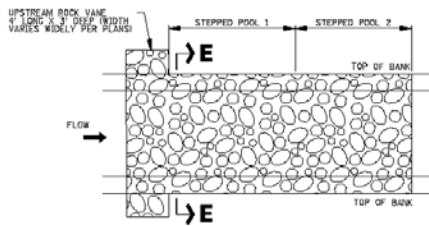
1. GRADE CHANNEL TO RECEIVE 3\"/>

ROCK SIZES	
C/D/D	= 18"
D/D	= 12"
D/D	= 6"

TYPICAL STEPPED POOL DETAIL
NOT TO SCALE



POOL ELEVATION AT UPSTREAM END (E-SECTION)
NOT TO SCALE

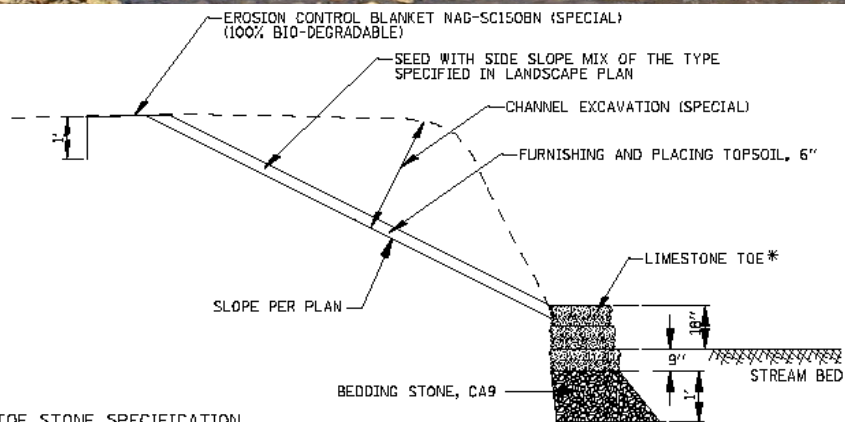


1. GRADE CHANNEL TO RECEIVE 3' DEEP POOL VANE AND 18" THICK ROCK FOR POOLS. START AT DOWNSTREAM END AND WORK UPSTREAM
2. EXCAVATE VAIN 3' POOL TO 18"
3. PLACE FILTER FABRIC
4. PLACE LAYER OF BOULDERS ACROSS BAFFLE, SPACE BOULDERS AT TOP OF CREST 12-18" DEEP
5. SPACE NEXT LAYERS BOULDERS 4" TO 6" APART ALONG DOWNSTREAM FACE TO FORM LOW FLOW FISH PASSAGE CHANNEL
6. SURFACE SHOULD BE ROUGH, DO NOT GRADE SMOOTH.

ROCK SIZES
D150
D125
D100
D75
D50
D25
D15
D10
D5
D2.5

TYPICAL STEPPED POOL DETAIL
NOT TO SCALE

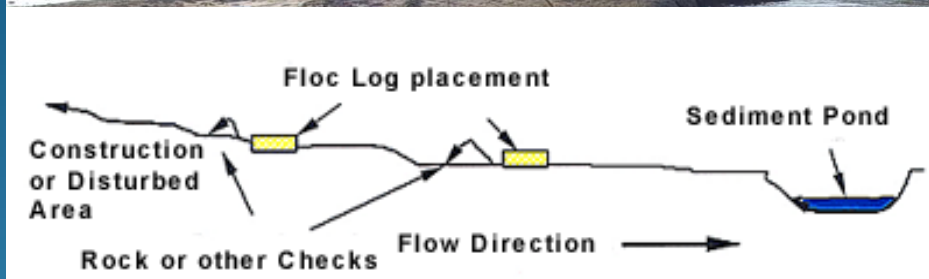




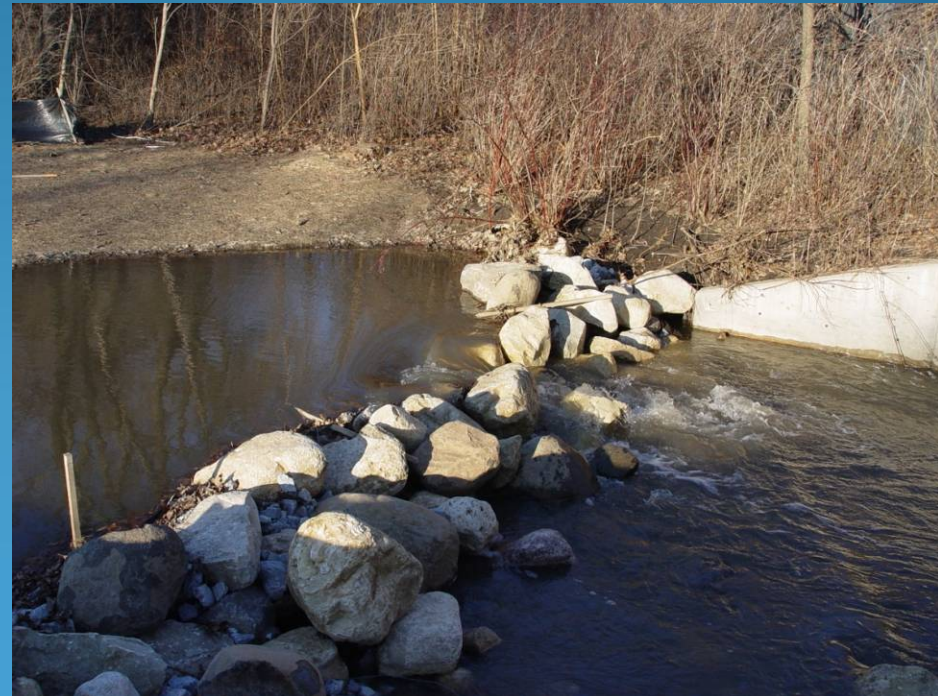
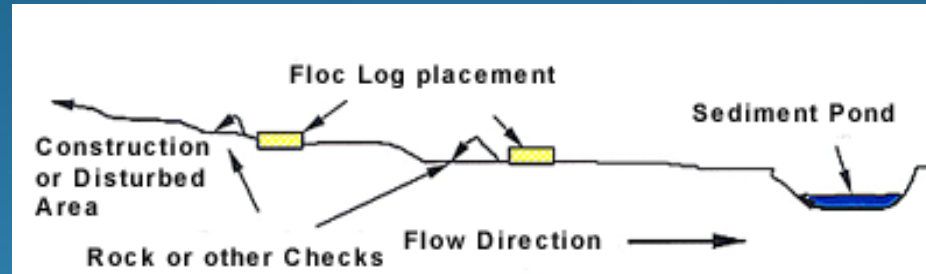
LIMESTONE TOE STONE SPECIFICATION
LIMESTONE LEDGE ROCK (SPLIT FACE)
9'-12" THICK
2'-3' DEEP
3'-4' LONG

* PLEASE NOTE THAT WALL HEIGHT MAYBE HIGHER AT LOCATIONS
TO BE DETERMINED IN THE FIELD BY THE ENGINEER.

LIMESTONE TOE VEGETATED BANK (TYP.)
NOT TO SCALE



Floc Log Application







Ponds and Wetlands





Littoral Shelf

Open Water



Open Water

Littoral Shelf



Midwest Tributary



Open Water

Littoral Shelf

Midwest Tributary



Open
Water

Inlet Channel



Western Relocated portion
of Ginger Creek



A photograph of a relocated portion of Ginger Creek. The image shows a winding waterway with a central inlet channel and surrounding open water areas. The banks are composed of dark, muddy soil, and there are some wooden posts or stakes driven into the ground. In the background, there is a line of bare trees under a clear sky. The text "Open Water" is overlaid in red on the upper left portion of the water.

Open Water


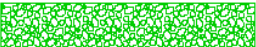


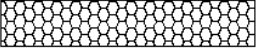






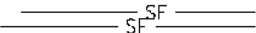
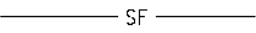


Inlet Channel

Western Relocated portion of Ginger Creek

Relocated West Ginger Creek

Original Ginger
Creek Channel

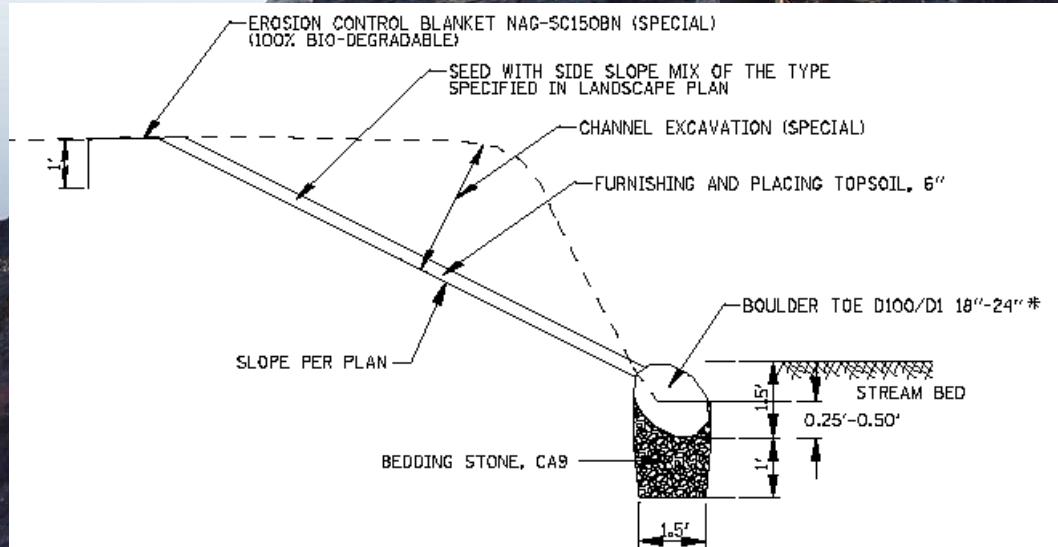
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-  NATURAL AREA SIGN

Relocated West Portion of Ginger Creek



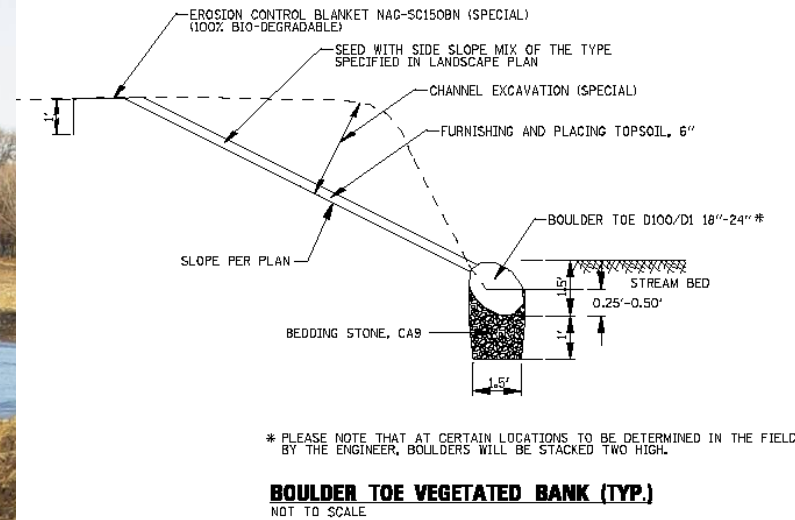
Midwest Club Tributary



* PLEASE NOTE THAT AT CERTAIN LOCATIONS TO BE DETERMINED IN THE FIELD
BY THE ENGINEER, BOULDERS WILL BE STACKED TWO HIGH.

BOULDER TOE VEGETATED BANK (TYP.)

NOT TO SCALE



Midwest Club Tributary

Questions?

