

REFERENCE REACH FIELD FORM
STREAM CHANNEL CLASSIFICATION LEVEL II

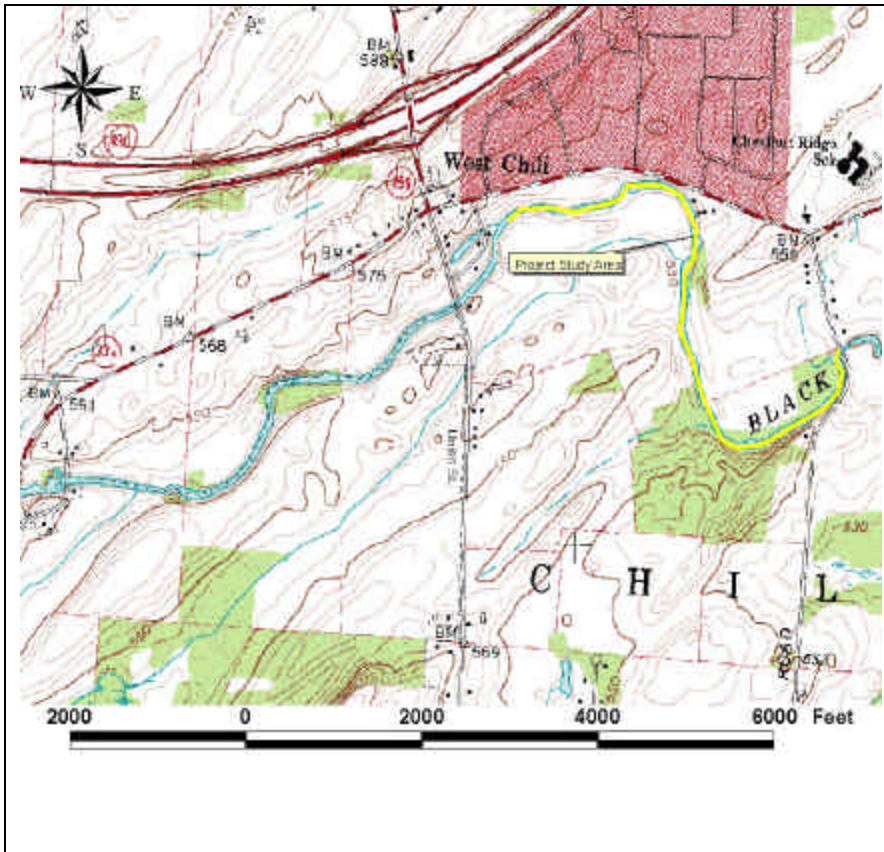
STREAM TYPE: Rosgen C4 to C5

STREAM NAME: Black Creek DRAINAGE AREA: 169 square miles BASIN NAME: Genesee

OBSERVERS: J. Hauber, F. Reese DATE: 10/7/2004

LOCATION:	Black Creek between Union Station Park and Stottle Road, Town of Chili, Monroe County	Latitude	From 43-05-29 to 43-05-20	Longitude	From 77-47-42 to 77-46-49	Mapped Soil Type(s)	Appleton silt loam	K Factor	0.43
							Eel silt loam		0.43
							Genesee silt loam		0.43
							Hilton loam		0.24

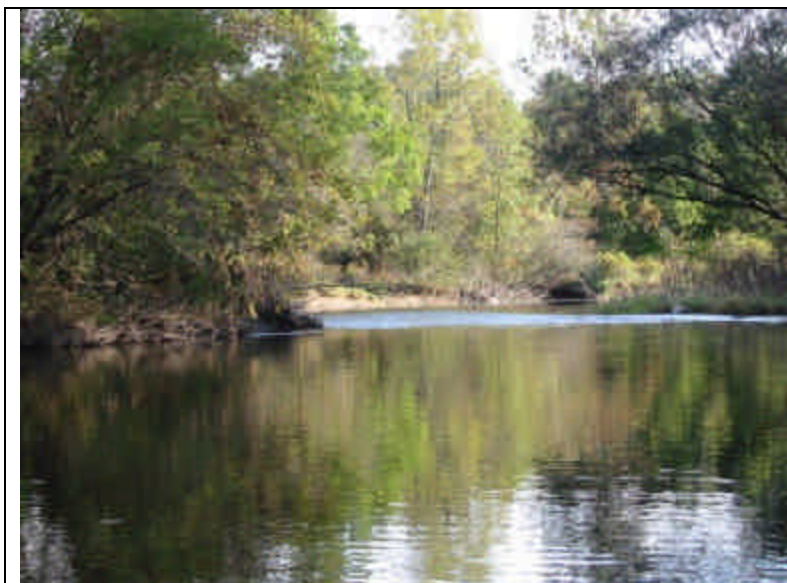

Bankfull WIDTH	100±	Ft.(W _{bkf})	Bankfull MAX>DEPTH	9.5 (estimated)	Ft.(d _{max})	Channel SLOPE	0.001	Ft/Ft		%
Bankfull Mean DEPTH	3.5 (estimated)	Ft.(d _{bkf})	Flood Prone Area WIDTH	400-500 (varies)	Ft.(W _{FP})	Valley SLOPE	0.00074	Ft/Ft		%
WIDTH/DEPTH Ratio	28.5		ENTRENCHMENT Ratio	5		SINUOSITY (Stream Dist/Valley Dist.)	1.49			
Channel MATERIALS: (Pebble Count)		D50	mm	D84	mm					



Black Creek, Sites CI-1 and CI-2, location map



CI-1 and CI-2, Aerial Photo Detail (2002)

	
<p>Exposed high banks on outside edge of meander, near Chili Avenue.</p>	<p>Undercut root systems of sugar maples, south bank of Black Creek, Union Station Park, Chili</p>

Site Description: This study reach extends from Union Station Park in the Town of Chili (east of NY Route 259, Union Street) to Stottle Road, and includes Black Creek Inventory sites CI-1 and CI-2. The site was accessed by canoe from Union Station Park. Bank height and water depth measurements were made from the canoe because water depths exceeded 4 feet in several areas. Creek depths from Union Station Park to a point where the creek runs adjacent to Chili Avenue were approximately 1.5 to 2 feet, with long pools separated by gravel riffles. Below the Chili Avenue proximity point, pool depths were 3-4 feet. Green ash, box elder, and black willow form an excellent buffer southward between the creek and Union Station Park. From Route 259 to Stottle Road, the north bank is privately owned. Where single family homes are located close to the creek, lawns are mowed to the top of the bank. Behind the Audino Lane apartments, the north bank is heavily wooded. A nature trail has been established along the creek bank behind the Audino Lane apartments.

Three tributaries form confluences with Black Creek within the study reach. One tributary flows into the creek from the south approximately 1500 feet east of Union Street. An intermittent drainage ditch flows into the creek from the north at the point where Chili Avenue is closest to the creek. A second intermittent tributary forms a confluence on the south side of the creek, south of a new housing tract. A third intermittent tributary joins Black Creek just west of the Stottle Road bridge. Some bank erosion was noted near these confluence points. Banks are generally stable where scour has not created high banks on the outside edges of meanders. High banks with exposed soils are subject to scour during high flow conditions. These areas are indicated in red on the photograph above.

Pebble counts were not done for this reach. Sinuosity and entrenchment ratios were estimated from channel pattern and dimensions measured from air photos and field investigation. The substrate appeared to be dominated by gravel and sand, with a few larger cobbles. Evidence of frequent, recent scouring indicates that this reach is experiencing some instability, possibly due to development in the watershed.

Statement of Problem: The project study area is located in a rapidly developing watershed area. A developed watershed area creates more frequent bankfull flow events, eventually leading to deteriorated stream conditions. Where woody riparian vegetation is removed or exists in thin strips along each bank, more frequent high flows undercut banks and create sloughing. Undercutting is more severe when the bank soils consist of fine sands and silts. In this reach, the mapped soil types are predominantly Genesee silt loam and Eel silt loam, both of which are fine sandy to silty alluvial soils. Several large trees were observed on scoured banks, with exposed root systems. Continued undercutting during bankfull flow events will eventually undermine these trees, and cause them to fall into the stream channel. Downed timber in the creek channel creates problems by directing stream flow against easily eroded bank areas. Southern banks near Stottle Road are high (6-8 feet) and show some erosion as the creek makes a broad sweep south and east. Some erosion and exposed tree roots occur here. Several expanses of high, undercut banks were observed on both the north and south creek banks. Undercut banks adjacent to Chili Avenue and Stottle Road may eventually threaten road and utility infrastructures if not corrected.

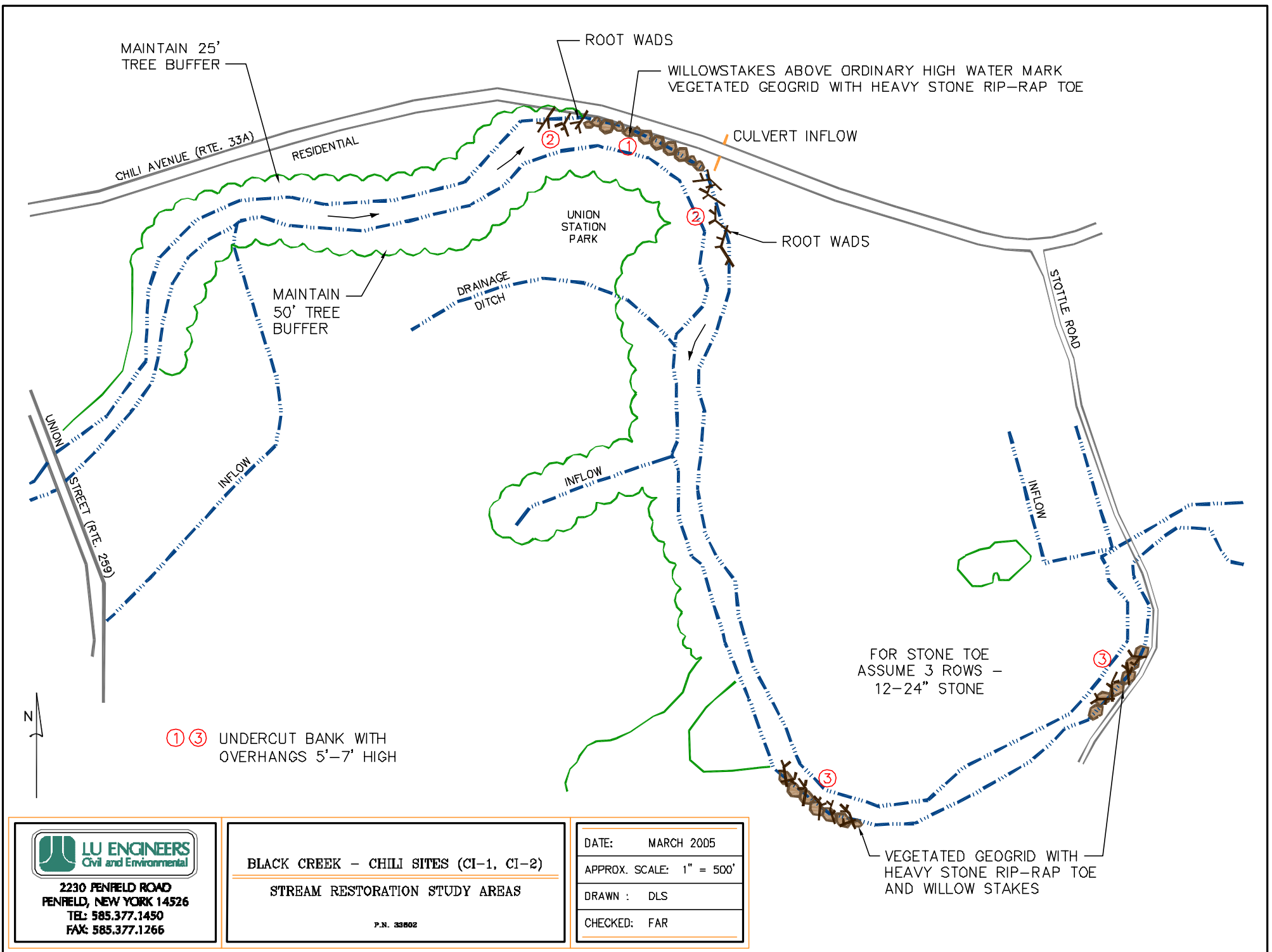
Recommended Restoration/Remediation Methods:

1. Encourage owners of existing properties abutting Black Creek to maintain a vegetated riparian buffer zone extending a minimum of 20 feet back from the creek bank.
2. Provide financial assistance to willing property owners to replant lawn areas adjacent to the creek with native woody species such as red osier dogwood, silky dogwood, and various willows. Encourage the use of live willow stakes, fascines and soaked willow logs to provide rapid cover on exposed soil banks.
3. Develop a streambank protection ordinance for the Town of Chili that requires the maintenance of a woody vegetated riparian buffer zone of at least 20 feet in width (wider in undeveloped areas) on either side of Black Creek and its tributaries.
4. Inspect the channel of Black Creek on a yearly basis to determine potential threats to utilities, roads and structures, particularly Chili Avenue, and to determine the need for removal of channel obstructions (e.g., downed timber) and remedial actions to protect sensitive bank areas.
5. Embed large stone rip rap in the scoured areas adjacent to vulnerable roadways and repair the embankment using vegetated geogrids, root wads, and willow stakes.

Cost Estimate:

Item	Unit	Unit Cost	Extended Cost
Area 1			
Heavy stone rip rap (24 in. +) (cy)	300	46	13800
Backfill soil (cy)	170	16	2720
Biodegradable geotextile (sy)	3000	1.25	3750
Live whips (6 ft. long)	L.S.	4500	4500
Willow stakes	300	8	2400
Turbidity curtain (sy)	45	30	1350
Excavation (cy)	222	12	2664
Mobilization	L.S.	1200	1200
Estimated cost			32384
Area 2			
Root wads (on site materials)	1 day labor	1500	1500
Rock	20 cy	46	46
Estimated cost			1546
Area 3			
Heavy stone rip rap (cy)	400	46	18400
Backfill soil	474	16	7584
Biodegradable geotextile (sy)	4800	1.25	6000
Live whips (6 ft long)	L.S.	7200	7200
Willow stakes	480	8	3840
Excavation (cy)	360	12	4320
Turbidity curtain	355 sy	30	10650
Mobilization			2300
Estimated cost			60294
Design costs			
Survey	5	1200	6000
Plans & permits	(4 dwgs x \$5000 ea) + Individual permit (\$10K)		30000
Estimated cost			36000
Other costs			
Public education for property owners (newsletter + mass mailing)	1	2000	2000
Streambank protection ordinance (1 time cost)	1	10000	10000
Yearly inspection/monitoring	1	1500	1500
Repair and maintenance of channel stabilization measures	1	2500	2500
Estimated cost			16000

Conceptual Plan Sheets/Standard Details



MAINTAIN 25'
TREE BUFFER

ROOT WADS

WILLOWSTAKES ABOVE ORDINARY HIGH WATER MARK
VEGETATED GEOGRID WITH HEAVY STONE RIP-RAP TOE

CHILI AVENUE (RTE. 33A)

RESIDENTIAL

CULVERT INFLOW

UNION
STATION
PARK

ROOT WADS

MAINTAIN
50' TREE
BUFFER

DRAINAGE
DITCH

STITTLE ROAD

UNION
STREET (RTE. 289)

INFLOW

INFLOW

INFLOW

FOR STONE TOE
ASSUME 3 ROWS -
12-24" STONE

① ③ UNDERCUT BANK WITH
OVERHANGS 5'-7' HIGH

VEGETATED GEOGRID WITH
HEAVY STONE RIP-RAP TOE
AND WILLOW STAKES



2230 PENFELD ROAD
PENFELD, NEW YORK 14526
TEL: 585.377.1450
FAX: 585.377.1266

BLACK CREEK - CHILI SITES (CI-1, CI-2)
STREAM RESTORATION STUDY AREAS

P.N. 33802

DATE:	MARCH 2005
APPROX. SCALE:	1" = 500'
DRAWN :	DLS
CHECKED:	FAR