

REFERENCE REACH FIELD FORM
STREAM CHANNEL CLASSIFICATION LEVEL II

STREAM TYPE: _____

STREAM NAME: Oatka Creek DRAINAGE AREA: 101.6 sq. miles BASIN NAME: Oatka

OBSERVERS: J. Hauber, F. Reese (observed from canoe) DATE: 10/5/2004

LOCATION: Oatka Creek, behind Pavilion Fire Hall Latitude 42°52'5" Longitude 78°1'39"

Mapped Soil Type(s)	<u>Eel silt loam</u>	<u>0.43</u>
	<u>Genesee silt loam</u>	<u>0.43</u>
	<u>Palmyra gravelly loam, 0-3% slope</u>	<u>0.20</u>
	<u>Wayland silt loam</u>	<u>0.43</u>

K Factor

Bankfull WIDTH	51	Ft.(W _{bkf})	Bankfull MAX>DEPTH	11.5	Ft.(d _{max})	Channel SLOPE	0.0018	Ft/Ft		%
Bankfull Mean DEPTH	4+	Ft.(d _{bkf})	Flood Prone Area WIDTH	60	Ft.(W _{FP})	Valley SLOPE	0.0018	Ft/Ft		%
WIDTH/DEPTH Ratio	12.75		ENTRENCHMENT Ratio	1.17		SINUOSITY (Stream Dist /Valley Dist.)		1.87		
Channel MATERIALS: (Pebble Count)		D50		mm	D84		mm			



Location of Site E-006, Oatka Creek south of hamlet of Pavilion, Genesee County



Aerial view of Oatka Creek near the Pavilion Fire Hall, Town of Pavilion, Genesee County



Photo 1. Detailed view of Rochester & Southern Railroad embankment adjacent to Oatka Creek south of Pavilion. Note placement of large concrete blocks, stones and rip rap to protect toe of slope.



Photo 2. Detailed view of exposed roots on large silver maple tree on east bank of Oatka Creek at Pavilion. This condition is typical of many large trees along the bank. Located on the outside curve of a meander, the roots are undercut when the channel flows at bankfull. Frequent bankfull flow conditions exacerbate undercutting and cause trees to fall into the channel.



Photo 3. Panoramic view of exposed bank along outside edge of meander adjacent to Rochester & Southern Railroad tracks. Note the accumulation of large woody debris, high exposed soil banks.

Site Description: This reach of Oatka Creek is located immediately west of the Rochester and Southern Railroad tracks in the hamlet of Pavilion in Genesee County. The railroad embankment has limited the eastward migration of a meander at this location. The channel forms a sharp curve around this site. The channel gradient is estimated at 0.0018 ft./ft through this section, dropping less than 10 feet over a distance of more than 5000 linear feet. A single, perennial tributary forms a confluence with the Oatka main channel just south of the project reach. Oatka Creek flows through a broad, relatively flat-lying flood plain between Wyoming and Pavilion. Agricultural fields are often cultivated as close to the top of the stream bank as possible. Vegetated riparian zones, where they exist, are generally thin (less than 15 feet) from the edge of the field to the stream channel top of bank). As a result, the stream channel carries a heavy suspended sediment load in this reach.

Soil types mapped for the stream channel are Genesee, Eel and Wayland silt loams. These soils are typically medium to fine grained silts. Better drained soils in the flood plain above the incised channel are mapped as Palmyra gravelly loam. Genesee and Eel soils are moderately well drained and somewhat poorly drained alluvial soils. These soils experience flooding, sometimes on an annual or semi-annual basis, but typically do not remain inundated or saturated for long periods of time. Wayland soils are poorly drained, hydric soils that are typically inundated or saturated for long periods of time. Palmyra soils are well drained, medium textured soils that do not usually experience flooding. The finer-textured soils exposed on high, overhanging banks on the outside of meanders are vulnerable to erosion during bankfull flow events.

Lu Engineers inspected this reach of Oatka Creek from a canoe in early October, 2004. The deepest thalweg depth measured 9.5 feet. Exposed soil banks measured 2.5 to 4 feet higher than the water level, indicating that bankfull mean depth is at least 4.5 to 5 feet.

Statement of Problem: This site was selected because the outside edge of the creek is located at the toe of the Rochester and Southern Railroad embankment. The railroad embankment has been damaged during previous flood events. Although large stone riprap has been placed at the toe of the slope to protect the embankment ballast, portions of the embankment are vulnerable to undercutting from the current. Erosion from this site was estimated at 0.395 tons of soil per year.

Portions of the channel banks are vertical or overhanging (Photo 2). Roots of large trees are exposed, and log jams were present at the sharp bends in the channel.

Fields in the watershed immediately above this reach are cultivated nearly to the edge of the stream, causing a high sediment load during precipitation events.

Recommended Restoration/Remediation Methods:

1. Relocate approximately 250 linear feet of stream channel away from the Rochester & Southern Railroad embankment into an existing natural depression bypass channel, leaving the existing channel in place as an oxbow wetland. Deepen the natural depression to create a channel with a dimension and form that blends with the existing channel.
2. Utilize abundant on-site materials to create log vanes and root wads to stabilize the outside edges of existing and the new meander curve. Utilize rip rap reinforcement to stabilize the outside curve of the relocated stream channel. Place root wads and willow wattles in channel banks at strategic locations to protect exposed soil areas. Use large woody debris to direct flow in desired directions.
3. Utilize rock J-vanes to direct the channel flow away from exposed soil banks.

4. Further survey and design will be required to determine appropriate morphology for the proposed channel. It is estimated that the new channel dimensions should be capable of passing approximately 900 cfs under bankfull conditions. This flow is estimated based on rough channel dimensions made during our limited site observation, channel width measurements from aerial photographs, and gradient measurements from U.S.G.S. topographic maps, and standard calculations. Channel cross section and profile survey and drainage calculations will be required for final design.

Land Use Recommendations:

- Coordinate with local private property owners to create and maintain a vegetated riparian zone between cultivated agricultural fields and the stream channel top of bank. The riparian zone should be at least 50 feet in width. A rough estimate of the loss of cultivated land is approximately 1.1 acre per linear foot of field adjacent to stream channel, assuming no riparian vegetation currently present. This riparian zone will serve to reduce the amount of sediment and agricultural chemicals that reach Oatka Creek.
- Establish a drainage easement along the stream channel to allow the local SWCD or other entity to monitor the stream channel for log jams and other obstructions, and to complete necessary bank stabilization and remediation.
- Develop a blanket permit with the U.S. Army Corps of Engineers and NYS Department of Environmental Conservation to cover routine stream maintenance and remediation activities such as construction of j-vanes, rock vanes, and root wads.

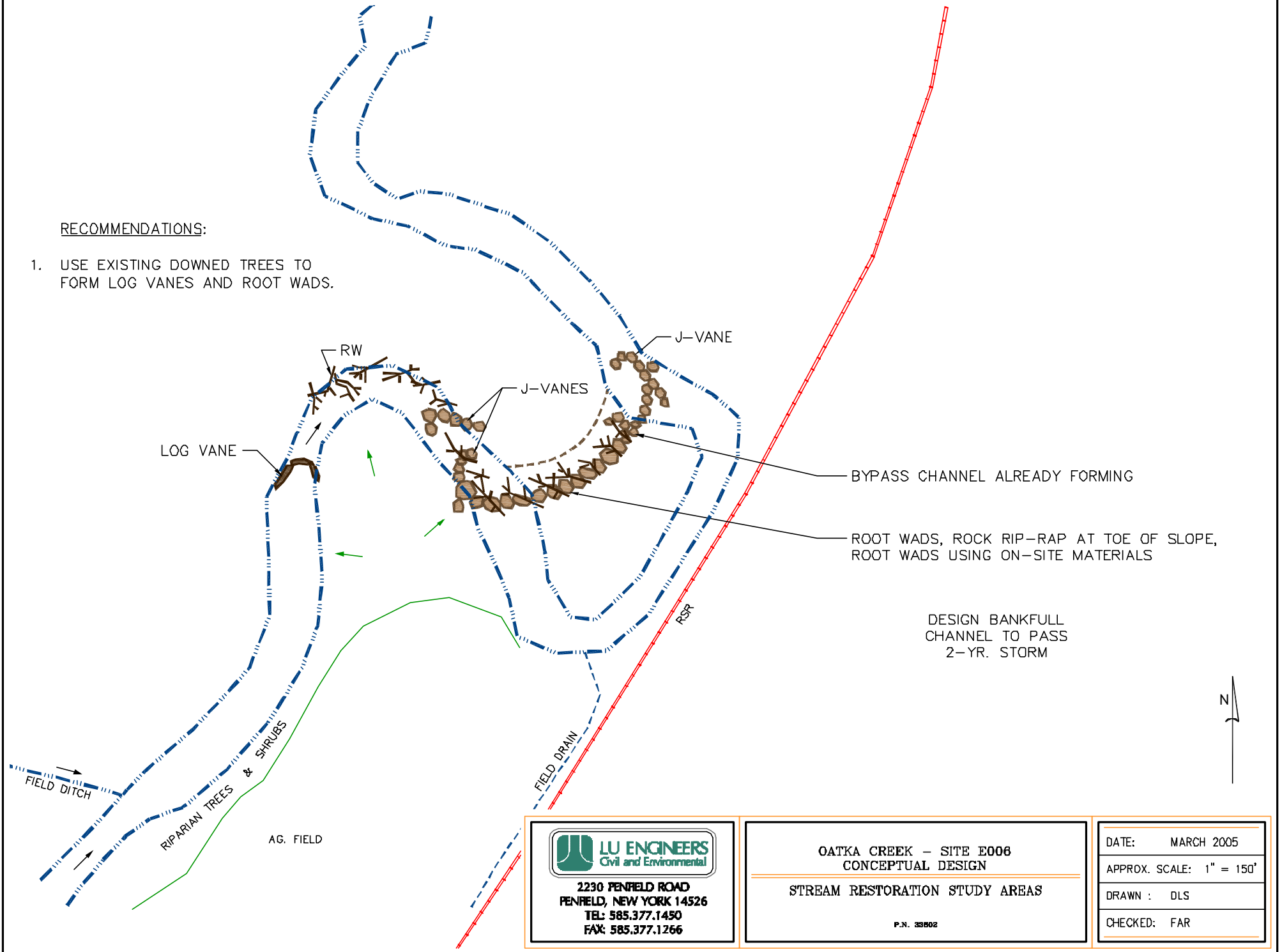
Cost Estimate:

Item	Unit	Unit Cost	Extended Cost (\$)
Excavation for new channel and embedding rock J-vanes in banks	1920	12	23040
Rock (3 J- vanes, and riprap at toe of slope	210	46	9660
Root wads (using on site materials)	2	1500	3000
Log vane	1	500	500
Turbidity curtain (sq. yd)	40	30	1200
Mobilization			1500
Survey	4	1200	4800
Plans and Permits			20000
Estimated Total Cost			63,700

Conceptual Plan Sheets/Standard Details

RECOMMENDATIONS:

1. USE EXISTING DOWNED TREES TO FORM LOG VANES AND ROOT WADS.



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OATKA CREEK - SITE E006
CONCEPTUAL DESIGN
STREAM RESTORATION STUDY AREAS
P.N. 33502

DATE:	MARCH 2005
APPROX. SCALE:	1" = 150'
DRAWN :	DLS
CHECKED:	FAR