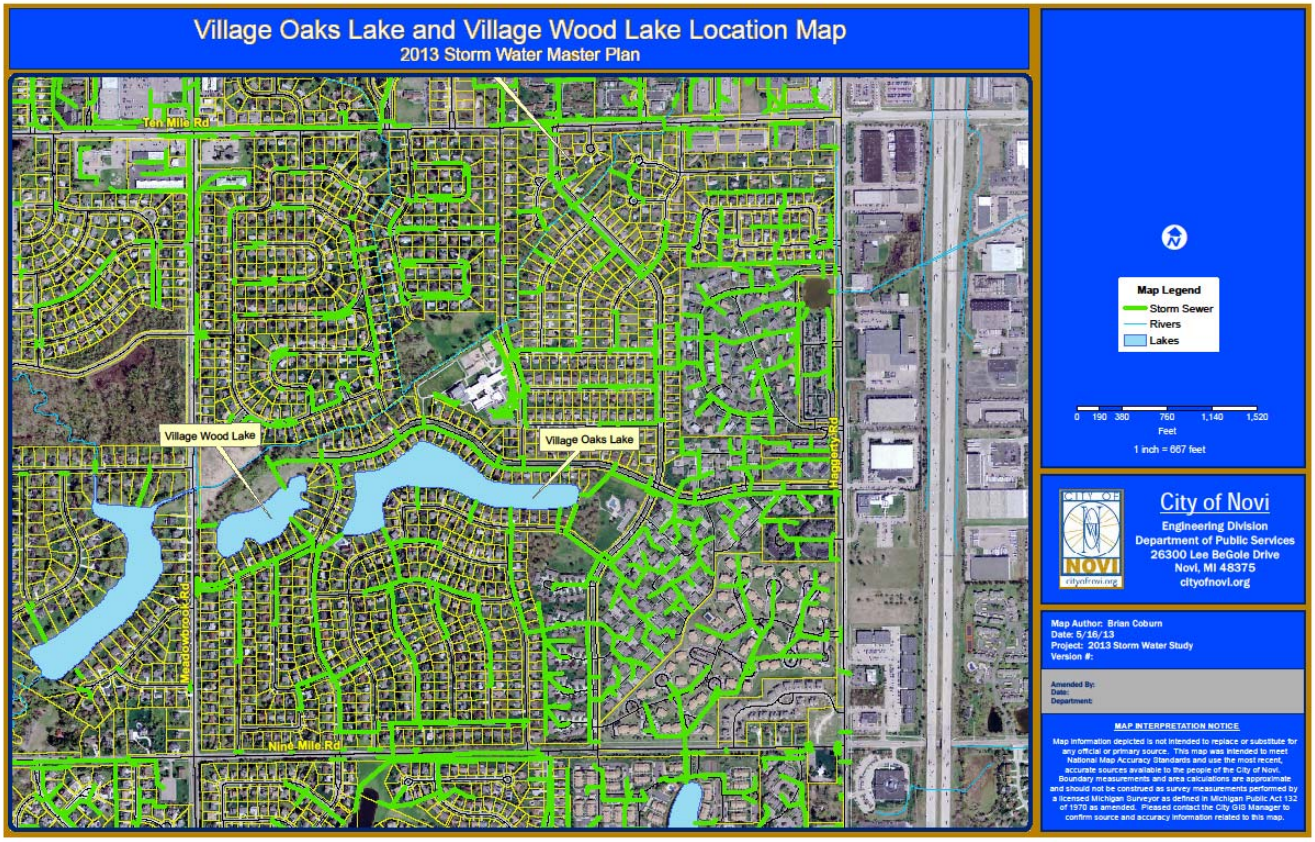
SECTION 5 – VILLAGE OAKS LAKE AND VILLAGE WOOD LAKE
Infrastructure Access and Maintenance Concerns

BACKGROUND

In 1984, the City of Novi passed a resolution taking on the responsibility for the on-going maintenance (including dredging) of Village Oaks Lake and Village Wood Lake. The lakes are located east of Meadowbrook Road, north of Nine Mile. Both were constructed when the subdivisions were built in the early 1970's. The eastern half of Village Oak Lake was hydraulically dredged by the City in 2005. There has been minimal maintenance of the storm water inlet and outlet pipes and structures over the past twenty years, which has primarily been limited to repairing visible damage to structures.



FIELD INVESTIGATION

In August 2013, Environmental Consulting & Technology, Inc. (ECT) and Spalding DeDecker Associates, Inc. (SDA) met onsite with the City of Novi Department of Public Services (DPS) staff, for the inspection of the inlet and outlet structures. Currently, the City has limited easements for accessing the infrastructure around Village Oaks and Village Wood Lakes. For the field investigation, each structure was accessed through private property.

Each of the located structures were mapped using GPS and are shown on the included map. One structure (Inlet #1) was not able to be located; however, DPS staff provided us with an approximate location (east end of Village Oaks Lake). The individual structures were difficult to locate due to the landscaping, steep terrain, and improvements installed by the homeowners. Structures were located in difficult to access areas, such as under large pine trees and, in one case, under a deck / overlook. Some inlet pipe end-sections were submerged, and therefore were not visible for observation.

Structure surrounded by Landscaping

Deck built over Structure

Access hatch in deck

Village Oaks Lake Outlet Structure Hidden by Landscaping

The outlet structure of Village Oaks Lake is located under heavy brush and the pipe is not visible due to a thick layer of stone rip rap. The outlet structure of Village Wood Lake had recently been repaired by the City, and additional rip rap was placed around the structure. The outlet structure and overflow are located in the Village Wood Park. This location is accessible to the public which has lead to safety and maintenance concerns.

CONCEPTUAL IMPROVEMENT OPTIONS

1. Acquire Easements, Repair / Replace Deteriorated Infrastructure: Drainage easements for access and maintenance should be acquired by the City from the individual homeowners and/or the Homeowners Association, as applicable. It is estimated that nine easements will be necessary to provide adequate access for both lakes. These can be negotiated individually or acquired through condemnation. Obtaining these easements would be necessary in order for the City to perform immediate and on-going maintenance. The inlet and outlet structures could then be accessed directly for heavy rehabilitation or full replacement. Significant grading will be needed to develop working areas at some structures. Due to the proximity to private property or impassible slopes, working from the water via boats or a small barge may be required.

2. Repair / Replace Village Oaks Lake Outlet Structure: The outlet structure of Village Oaks Lake is in poor condition. The structure can be replaced with a new structure of the same size in the same location assuming that there are no problems with the current outlet and capacity of the structure (none were reported). If there are known capacity issues, a hydraulic analysis should be completed for the contributing area to the lake and the new outlet structure sized accordingly to improve the hydraulics of the area.

3. Locate Buried Structure: The inlet structure that could not be located is likely buried due to landscaping. It could be located using a variety of methods: Accurate as-built plans could be utilized if they are available, televising to the structure through the pipe at the upstream structure, or advanced surveying equipment and techniques could be used to locate the structure. Once the structure is located, further investigation should be performed to evaluate the integrity of the structure and pipe.

4. Eliminate Public Access to Outlet and Overflow Structures in Village Wood Park: Due to on-going concerns of public access to the outlet structure, security fencing and warning signs can be installed to deter the public from accessing the outlet and overflow structure. This would improve safety and reduce vandalism opportunities.

PRELIMINARY ESTIMATES

Option 1. *Repair Damaged Infrastructure*

Item Description	Unit	Unit Price	Quantity	Item Cost
Mobilization	LSum	$46,000	1	$46,000
Locate Structure	LSum	$2,000	1	$2,000
Clearing (Landscape)	LSum	$34,500	1	$34,500
Tree Removal	Each	$500	16	$8,000
Deck Removal	LSum	$2,500	1	$2,500
Cleaning/Televising Sewer/Structure	LSum	$59,500	1	$59,500
Erosion Control	LSum	$24,000	1	$24,000
Working Platform	LSum	$50,000	1	$50,000
Inlet/Outlet Structure Repairs/Replacement	Each	$9600	12	$115,200
Sewer Pipe Replacement	Feet	$45	1,350	$60,750
Riprap	Syd	$50	60	$3,000
Deck Replacement	LSum	$5,500	1	$5,500
Restoration	LSum	$100,000	1	$100,000
Easement Acquisition	Sft	$12	12,000	$144,000
			Contingency (25%)	*$164,000*
			Estimate =	**$818,950**

NOTE – Access from the water may be the only practical option for several locations.

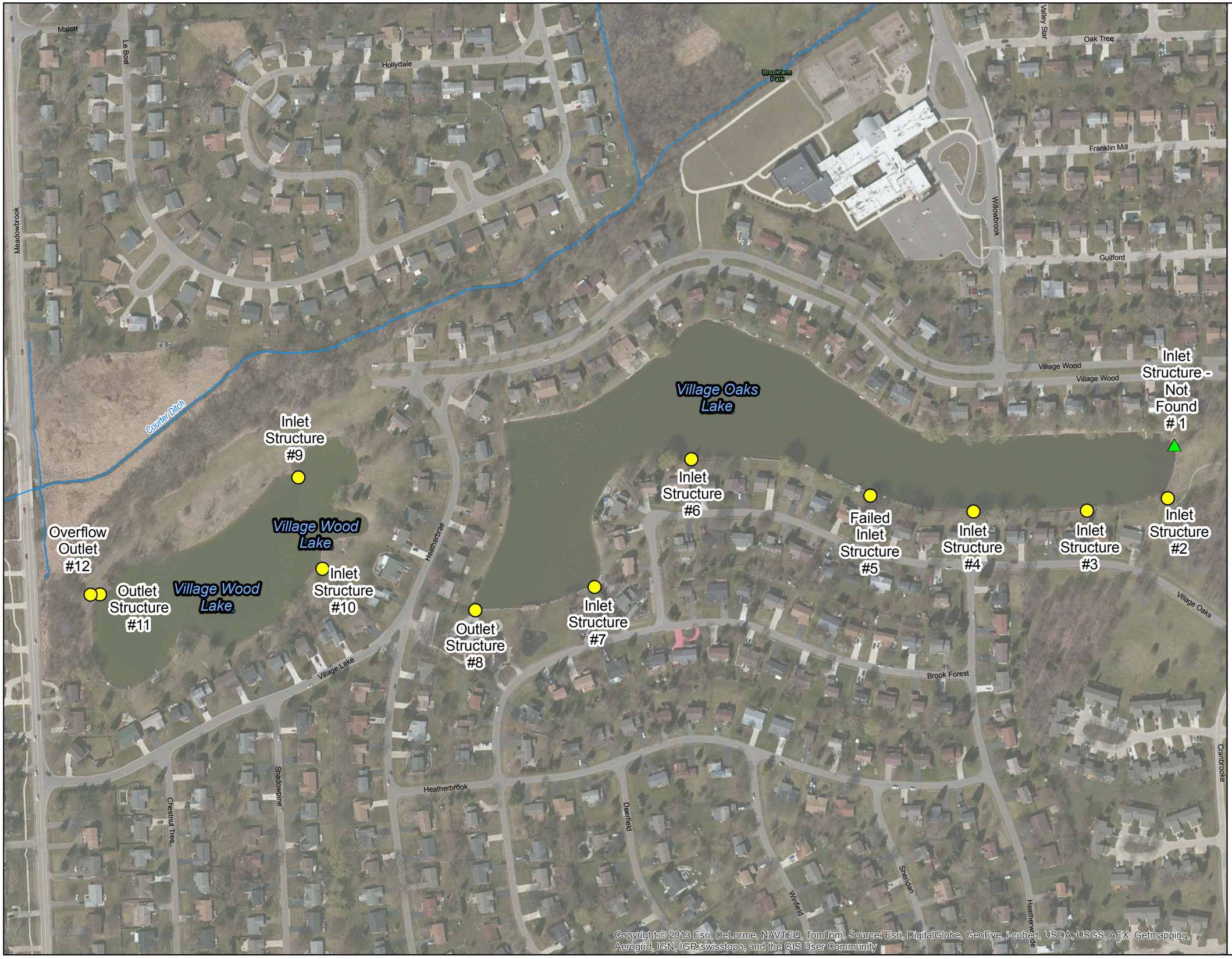
Option 4. *Eliminate Public Access to Outlet and Overflow Structures in Village Wood Park*

Item Description	Unit	Unit Price	Quantity	Item Cost
Mobilization	LSum	$2,500	1	$2,500
Chain Link Fence, 72-inch	Feet	$30	450	$13,500
6’ Fence Gate	Each	$750	1	$750
Restoration	LSum	$1,250	1	$1,250
			Contingency (25%)	*$4,500*
			Estimate =	**$22,500**

Please note that the contingency is each of these estimates includes permitting costs, soil erosion control measures, and miscellaneous work items to complete the improvement. The costs do not include engineering services.

ECT
Environmental Consulting & Technology, Inc.

City of Novi
Stormwater Master Plan
Village Oaks Lake & Village Wood Lake



Structures

Structures Not Found

N
W E
S

0 125 250 500
Feet

Access to Structure #2

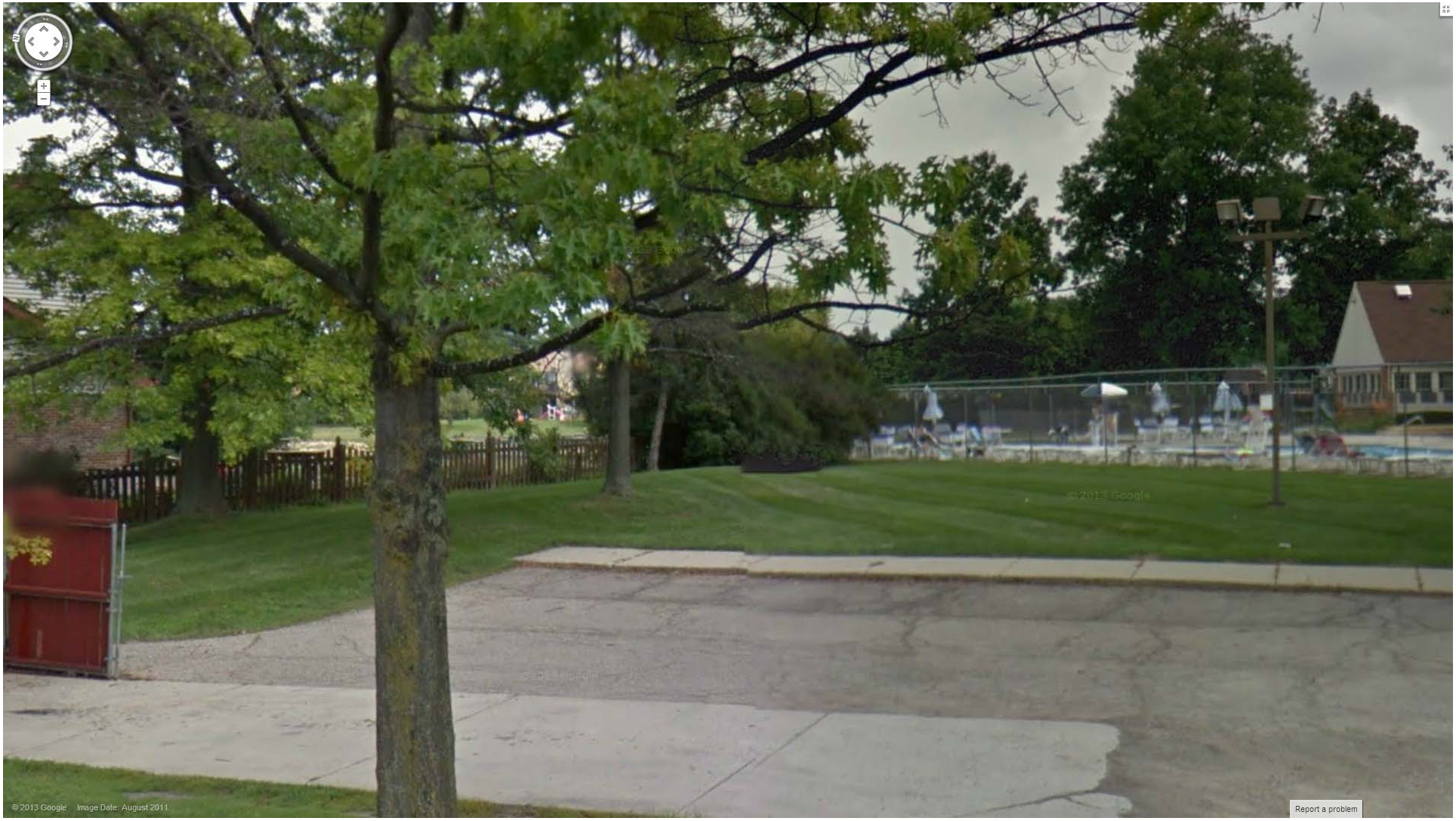
Access to Structure #3

Access to Structure #4

Access to Structure #5

Access to Structure #6

Access to Structure #7



Access to Structure #8

Access to Structure #10