



**Briarcliffe Lakes System Flood Study**

**Wheaton, Illinois**

Prepared for

**City of Wheaton**  
303 W Wesley Street  
Wheaton, Illinois 60187

Prepared by

**Christopher B. Burke Engineering, Ltd.**  
**9575 W. Higgins Road, Suite 600**  
**Rosemont, IL 60018**

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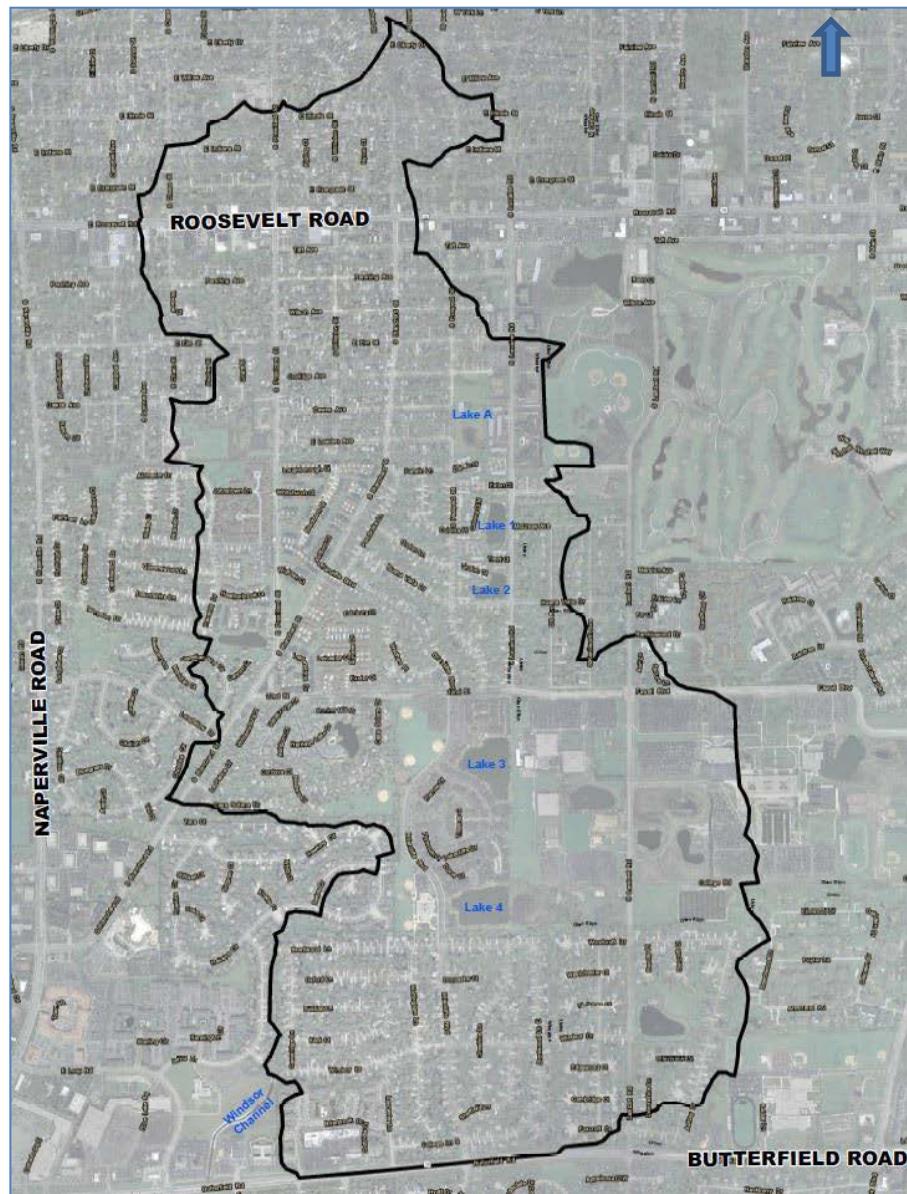
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## EXECUTIVE SUMMARY

The City of Wheaton was significantly affected by flooding during the April 17-18, 2013 storm event. Various areas of the City were impacted such that basements and first floors were flooded. One of the areas affected was the Briarcliffe Lakes System. This watershed drains into the Danada Forest Preserve Rice Lake located south of Butterfield Road. The general limits of the study area are Roosevelt Road to the north, Naperville Road to the west, Butterfield Road to the south, and Lambert Road to the east. An exhibit depicting the watershed is shown in Figure 1-1.



*Figure 1-1 Briarcliffe Lakes Watershed Map*

Within these limits and watershed, the following flooding was observed by City staff:

- Street flooding between Lake No.1 (the use of “Briarcliffe” prior to “Lake” is omitted for brevity, and any “lakes” in this report refer to the Briarcliffe Lake System) and Lake No.2
- Street flooding between Lake No.2 and Lake No.3
- Overland flow between Lake No.3 and Lake No.4
- Briarcliffe Lake No. 4 overtopping and downstream structures flooding
- Street flooding along the overland flow route or the storm sewer route downstream of Lake No.4

The primary focus of this study was to document the existing drainage system and identify alternatives that would reduce the risk of future flooding. The study area contains Zone A floodplain over Lakes No.3 and No.4, over two isolated street flooding areas along the overflow route of Lake No.4, and also over the downstream open-channel

Five alternatives were evaluated to determine what projects could be implemented to provide flood reduction benefits within the Briarcliffe Subdivision. Five alternatives, which consisted of various storage and conveyance components, were evaluated, plus a sixth alternative which consisted of buyouts of the affected properties. The hydraulic analysis of each alternative, unless otherwise mentioned, does not include the possible improvement of the Lake 4 berm as may be required by Illinois Department of Natural Resources – Office of Water Resources (IDNR-OWR). Any modification to the berm will require additional survey, coordination with the College of DuPage (COD), and permitting through IDNR-OWR. It is recommended that this berm be raised approximately 0.65', to elevation 746.0, which is the historical required berm height. This improvement in addition to other improvements listed allows for additional available storage within the lake without causing negative upstream impacts. IDNR-OWR issued a May 10, 2013 letter to the Briarcliffe Lakes Homeowners Association (BLHA) requiring a dam safety permit for Lake No.4. Responding to this letter was not part of this study, but the modeling performed for this study can serve as the hydrologic and hydraulic basis for a response.

The studied alternatives are summarized in Table 1-1 and the recommended project is included as Table 1-2.

Alternative ID	Project Components	Cost	Comments
Alternative 1	<ul style="list-style-type: none"> <li>Excavation of Briar Patch Park</li> <li>Installation of a 48" equalizer pipe connecting Briar Patch Park to Lake 3.</li> </ul>	\$6.90 million	<ul style="list-style-type: none"> <li>Storage basin is proposed within Park District Property.</li> <li>A detailed survey of Briarcliffe Boulevard will need to be performed to determine invert elevations of the equalizer pipe.</li> </ul>
Alternative 2	<ul style="list-style-type: none"> <li>Rehabilitation of Lake 4 southern berm by raising it to elevation 746.0</li> </ul>	\$380,000 (does not include cost to meet IDNR-OWR requirements – still need to be defined)	<ul style="list-style-type: none"> <li>Requires coordination with the College of DuPage.</li> <li>Requires IDNR-OWR permitting.</li> <li>Does not have significant flood reduction benefits</li> <li>Settlement of the Lake 4 berm has caused upstream benefits</li> </ul>
Alternative 3	<ul style="list-style-type: none"> <li>Installation of a bypass sewer from Lake 3 to downstream of Lake 4 at Nottingham Lane</li> </ul>	\$3.46 million	<ul style="list-style-type: none"> <li>Full street topographic survey would be required to determine the feasibility of this project.</li> <li>Bypassing a portion of the flow tributary to Lake 4 does not have any significant benefits to the study area.</li> </ul>
Alternative 4	<ul style="list-style-type: none"> <li>Installation of a 4'x10' RCBC bypass sewer from Brentwood Lane/Cheshire Lane to Windsor Channel</li> </ul>	\$10.43 million	<ul style="list-style-type: none"> <li>The existing 72" storm sewer along Windsor Ave is replaced with a 4' x 10' RCBC along Windsor Lane.</li> <li>Provides a significant reduction in flooding in the 100-year critical storm event.</li> </ul>
Alternative 5	<ul style="list-style-type: none"> <li>Create 26 acre-feet of flood storage by excavating the existing Briar Patch Park</li> <li>Rehabilitate the Lake 4/Pond 7 southern berm</li> <li>Installation of a 3.5' x 10' RCBC bypass sewer from Brentwood Lane/Cheshire Lane intersection south to Windsor Ave ultimately discharging to Windsor Channel</li> </ul>	\$17.23 million	<ul style="list-style-type: none"> <li>Storage basin is proposed within Park District Property.</li> <li>A detailed survey of Briarcliffe Boulevard will need to be performed to determine invert elevations of the equalizer pipe.</li> <li>The existing 72" storm sewer along Windsor Ave is replaced with a 4' x 10' RCBC along Windsor Lane.</li> <li>Provides a significant reduction in flooding in the 100-year critical storm event.</li> </ul>

Alternative 6	<ul style="list-style-type: none"> <li>Buyout and demolish 43 affected properties</li> </ul>	\$14.69 million	<ul style="list-style-type: none"> <li>Costs includes demolishing and administrative costs</li> <li>Costs do not include any special remediation structures.</li> <li>Will require voluntary buyouts from the affected property owners</li> <li>If FEMA/IEMA funds are used, restrictions on use may be imposed</li> <li>Will eliminate structural flooding for all homes participating in the buyout</li> <li>•</li> </ul>
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*Table 1-1 Alternative Analysis Summary*

Study Area	Recommended Project	Cost	Level of Protection	Comments
Alternative 4	<ul style="list-style-type: none"> <li>Installation of a 4'x10' RCBC bypass sewer from Brentwood Lane/Cheshire Lane to Windsor Channel</li> </ul>	\$10.43 million	100-year	<ul style="list-style-type: none"> <li>The existing 72" storm sewer along Windsor Ave is replaced with a 4' x 10' RCBC along Windsor Lane.</li> <li>Provides a significant reduction in flooding in the 100-year critical storm event.</li> <li>Will require authorization by the Forest Preserve District for any flood increases in Rice Lake.</li> </ul>

*Table 1-2 Project Recommendation Summary*

**CHAPTER 1****PROJECT OVERVIEW****1.1 INTRODUCTION**

In April 2013, the City of Wheaton (City) experienced significant flooding, including basement and first floor flooding at various locations, including areas in the vicinity of the Briarcliffe Lakes System. This watershed is part of the headwaters of the East Branch DuPage River Tributary No. 5. This tributary drains into the Danada Forest Preserve Rice Lake located south of Butterfield Road. The general limits of the study are Roosevelt Road on the north, Naperville Road on the west, Butterfield Road on the south and Lambert Road on the east (Exhibit 1). Within these limits and watershed, the following flooding was observed by City staff:

- Street flooding between Lake No. 1 and Lake No. 2
- Street flooding between Lake No. 2 and Lake No. 3
- Overland flow between Lake No. 3 and Lake No. 4
- Lake No. 4 overtopping and downstream structures flooding
- Street flooding along the overland flow route or the storm sewer route downstream of Lake No. 4

The four lakes associated with the Briarcliffe Lakes Subdivision development (herein referred to as lakes) are online storage facilities. Lake No. 4 is hydraulically connected to Pond 7, which is a wetland area located within College of DuPage (COD) property, and in the Village of Glen Ellyn. The primary focus of this study was to identify alternatives to help reduce the risk of future flooding within the residential neighborhood located south of Lake 4/Pond 7. The concept level improvements were developed based on detailed hydrologic and hydraulic analysis using the XP-SWMM computer modeling program.

Problem areas are described in Chapter 3, EXISTING CONDITIONS ANALYSIS. Concept level flood risk reduction alternatives along with estimates of construction cost are provided for the study area in Chapter 4, PROPOSED CONDITIONS ANALYSIS.

**1.2 PURPOSE AND SCOPE**

The purpose of this study is to analyze the feasibility of stormwater drainage improvements in the vicinity of the Briarcliffe Lakes System for storm events up to and including the 100-year critical design storm event. Proposed improvements include flood storage, improvements to the conveyance system, and reestablishing the existing Lake 4 berm. Improvements were analyzed for each study area to determine the effect on peak water surface elevations and runoff rates.

The scope of services included the following tasks:

- Coordinate survey data collection of storm sewers, overflow elevations, and low entry elevations that may impact each study area;

- Conduct field visits and collect supplemental data as necessary;
- Create an XP-SWMM hydrologic & hydraulic model to evaluate existing conditions and analyze flood risk reduction alternatives;
- Complete evaluation of alternatives to determine what is appropriate for detailed analysis;
- Prepare concept level plans and cost estimates for proposed improvements;
- Prepare a report documenting the modeling/evaluation process and summarizing findings and recommendations;
- Present findings to the City illustrating the existing flooding problems and recommended improvements.

### 1.3 ORGANIZATION OF THIS DOCUMENT

This report is divided into five chapters. A brief summary of the contents of each chapter is presented below:

- Chapter 1, PROJECT OVERVIEW, presents the purpose and scope of the project and a description of the project location.
- Chapter 2, DATA COLLECTION, summarizes information gathered from the Village, field survey, and other sources.
- Chapter 3, EXISTING CONDITIONS ANALYSIS, provides a summary of the hydrologic and hydraulic modeling for the existing condition.
- Chapter 4, PROPOSED CONDITIONS ANALYSIS, provides a summary of the hydrologic and hydraulic modeling for the proposed condition.
- Chapter 5, CONCLUSIONS AND RECOMMENDATIONS, summarizes the findings of the CBBEL study and provides a list of recommended improvements to reduce the risk of future flooding based on the study results.

## CHAPTER 2 DATA COLLECTION

Data that was used in this study was collected from a variety of sources. Each data source is listed in Table 2-1 below, along with the data provided by each source:

Source	Data Provided
City of Wheaton	<ul style="list-style-type: none"> <li>• GIS Storm Database for City of Wheaton</li> </ul>
City of Wheaton	<ul style="list-style-type: none"> <li>• April 2013 Storm Event Photographs</li> </ul>
DuPage County	<ul style="list-style-type: none"> <li>• 2' contour aerial topographic mapping</li> </ul>
CBBEL	<ul style="list-style-type: none"> <li>• Topographic survey</li> <li>• Numerous site visits</li> </ul>

*Table 2-1 Data Sources*

### 2.1 ITEMS REVIEWED

#### 2.1.1 DESIGN REPORTS

- “Briarcliffe Lake No. 4 (Willoway Brook Drainage Basin)”, dated March 1997.
- “Williston Basin Tributary Area Flood Study”, dated August 2012.

#### 2.1.2 PLAN SETS

- Foxcroft Subdivision Engineering Plans, dated April 19, 1967.
- Briarcliffe Subdivision Engineering Plans, dated December 14, 1970.
- Lake A Design Plans, dated August 11, 1976.
- Briarcliffe Lakes Manor Homes Subdivision Record Drawings, dated October 30, 1980.
- Engineering Plans for the Briarcliffe Offsite Storm Sewer, dated November 20, 2013.
- “As-Built ‘Build Illinois Program’ Briarcliffe Flood Control Project”, undated.

#### 2.1.3 MISCELLANEOUS

- Briarcliffe Development Timeline and supporting documentation, various dates.
- April 2013 Storm Event Survey Approximations
- Photos
- Resident input from field visits

**CHAPTER 3****EXISTING CONDITIONS ANALYSIS**

This chapter presents the nature, type, and severity of the problems that were identified. A detailed description of the XP-SWMM hydrologic and hydraulic modeling used for this analysis is also provided.

**3.1 BRIARCLIFFE LAKES SYSTEM**

The Briarcliff Lakes System and surrounding areas are tributary to the East Branch DuPage River (EBDR) Tributary No. 5. Based on the DuPage County 2-foot mapping, there is approximately 1,220 acres (1.9 square miles) tributary to the upstream limit of the Windsor Channel (which is adjacent to the IIT Rice Campus), including the Williston Basin located north of Roosevelt Road, previously studied by V3 Companies. The watershed is generally bounded on the north by Harwarden Street, on the west by Naperville Road, on the east by Park Boulevard and on the south by Butterfield Road, as shown on Exhibit 3. Based on review of existing topography, there are areas outside of the area tributary to Briarcliff Lakes that overflow into this watershed, i.e. the Hidden Lakes subdivision. The drainage pattern of the watershed is generally from north to south.

The Briarcliff Lakes System generally drains from north to south through a series of storm sewers and online ponds (Lake A and Briarcliff Lakes No. 1 through No. 4.) The outflow from Lake No. 4 is conveyed via storm sewer, ultimately outletting into Windsor Channel via a 72-inch sewer prior to discharging under Butterfield Road to Rice Lake. According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panels 508 of 1006, effective December 16, 2004 (Exhibit 2), there is Zone A floodplain over Lakes No. 3 and No. 4, two isolated street flooding areas along the overflow route of Lake No. 4 and Windsor Channel. Panel 505 shows no floodplain associated within Lake A and Lakes No. 1 and No. 2. Lake A has a pump station for an underdrain system so that the lake can provide recreational ball fields during dry periods. The main outlet of this storage facility is a 66-inch pipe that flows by gravity south to Lake No. 1. The remaining lakes drain by gravity.

*Lake A*

Lake A is located south of Coolidge Avenue and west of Prospect Street (Figure 3-1). This basin has approximately 326 acres of tributary area and 41 acre-feet of storage volume up to the computed 100-year high water level (HWL), which is beyond the original design. There are three separate inflows into the pond: two 24" diameter storm sewers on the north and an overflow weir on the southeast corner. It has a low flow pump system for an existing underdrain system. Because this pump will shut off in larger storm events, it was not



*Figure 3-1  
Lake A*

included in this hydraulic analysis. The main outlet for the Lake is a gravity overflow located on the south end of the basin. The computed 50- and 100-year, 24-hour high water levels (HWLs) of the Lake are 750.8 and 751.7 feet NAVD88 (typical), respectively.

#### *Lake No. 1*

Lake 1 is located along Lorraine Road to the east and south of Eaton Court and south of Lake A (Figure 3-2). This basin has approximately 373 acres of tributary area, including the area tributary to Lake A, and 19 acre-feet of storage volume up to the computed 100-year HWL. The Lake 1 area receives flow from the 66" storm sewer from Lake A in addition to direct runoff. There are minor storm sewers that tied into the 66" pipe north of Lake 1. The overland flow path into Lake 1 would be in the northwest corner of the lake. In the event that this overflow occurs, there would be major street flooding. The only flooding reported to date has been shallow flooding at the intersection of Prospect Street and Darwin Lane. Under existing conditions the pond will overtop towards the east into Lorraine Road. There is a low point in Lorraine Road which collects water (at approximately McCreey Avenue) where the roadway and Lake 1 will become a level pool once Lake 1 overtops and eventually flow south along Lorraine Road towards Lake 2. The computed 50- and 100-year, 24-hour high water levels (HWLs) of the Lake are 749.8 and 750.3, respectively.



*Figure 3-2  
Lake No. 1*

#### *Lake No. 2*

Lake 2 is located immediately south of Lake 1. Lake 2 is bound by Lorraine Road to the east, Buena Vista Drive to the south and Trent Court to the north (Figure 3-3). This basin has approximately 444 acres of tributary area, including the upstream tributary area, and 20 acre-feet of storage volume at the computed HWL. The primary inflow into Lake 2 is the 66" outlet pipe from Lake 1 in addition to direct runoff from the surrounding area via collector storm sewers, including a 36" storm sewer from the west, that extends to southwest Briarcliff Boulevard. The main outlet is a 66" pipe that conveys flow south to Lake 3. Based on historical observations and topography, this pond will overflow towards the east into Lorraine Road. At the intersection of Lorraine Road and Buena Vista Boulevard, floodwaters flow westerly towards the intersection of Buena Vista Boulevard and Prospect Street. According to the survey and historical observations, two conditions may occur: if the HWL of Lake 2 is lower than the rim invert of the 36" storm sewer on Briarcliff Boulevard, then floodwaters will be conveyed to Lake 2 and continue to flow south through the Briarcliff Lakes System; however, if HWL of Lake 2 exceeds this rim elevation, floodwaters will pond in Briarcliff Boulevard and once the overland flow path is engaged along Wadham Place, floodwaters will traverse southeast towards Lake 3. The computed 50- and 100-year, 24-hour high water levels (HWLs) of the Lake are 749.5 and 750.0, respectively.



*Figure 3-3  
Lake No. 2*

### *Lake No. 3*

Lake 3 is bound by the north and west by the Lakeside Apartment Homes, on the east by the College of DuPage (COD) and on the south by the Briarcliffe Lakes Manor Homes (Figure 3-4). This basin has approximately 681 acres of tributary area, in addition to the restricted outflow from the two storage facilities located on the east and west side of President Street north of 22<sup>nd</sup> Street. Lake 3 and the low area within the COD campus combined have approximately 48 acre-feet of storage volume at the design HWL. At the overtopping elevation, Lake 3 and the COD campus have 54 acre-feet of storage volume.

The primary inflow into Lake 3 is a 66" outlet pipe from Lake 2. There is also a 48" pipe that conveys flow from the neighborhoods to the west and discharges into Lake 3 at the northwest corner. There is also a 12" pipe along the eastern berm that conveys flow into Lake 3. Additionally, according to the V3 plans, there is another inlet into Lake 3. The main outlet is a 42" pipe that conveys flow south to Lake 4. Based on topography, runoff exceeding the capacity of the 42" pipe will overland flow east towards the overland flow swale that is located between Lakes 3 and 4. At the time of the survey, earthwork was being completed within the COD property and therefore the overflow is based on the 2-foot topography and the original plans for the Briarcliffe Subdivision. The computed 50- and 100-year, 24-hour high water levels (HWLs) of the Lake are 748.0 and 748.2, respectively.



*Figure 3-4  
Lake No. 3*

### *Lake No. 4*

Lake 4 is bound on the north by the Briarcliffe Lakes Manor Homes, on the east by the COD, on the south by the homes on Brentwood Lane and on the east by Briarcliffe Boulevard (Figure 3-5). This basin has approximately 712 acres of tributary area, not including the area tributary to Pond 7, discussed below, and 60 acre-feet of storage volume. Lake 4 is owned by the homeowner's association for the adjacent residential neighborhood. The primary inflow into Lake 4 is the 42" outlet pipe from Lake 3, which enters at the northeast corner of Lake 4. An 18" RCP along the southern berm was located; however, it has been plugged by the City. The primary outlet of Lake 4 is a 21" RCP located within the western embankment. There is a berm on the south side of Lake 4 that separates the lake from the residential neighborhood to the south; however, the embankment elevation is lower than the computed HWL elevation of the Pond, thus overtopping occurs. The computed 50- and 100-year, 24-hour high water levels (HWLs) of the Lake are 745.8 and 746.0, respectively.



*Figure 3-5  
Lake No. 4*

### *Pond 7*

Pond 7 is a wetland area located immediately east of and is hydraulically connected to Lake 4 (Figure 3-6). This basin has approximately 41 acres of tributary area, which is ultimately tributary to Lake 4, and 45 acre-feet of storage volume. A portion of the required storage for the Briarcliff residential development is provided in Pond 7. The two lakes are separated by a berm with the primary overflow being a wooden weir. Pond 7 is located on COD property which is located in the Village of Glen Ellyn. A site topographic survey was not performed of Pond 7, but it was included in the XP-SWMM modeling based on the 2-foot topography. The computed 50- and 100-year, 24-hour high water levels (HWLs) of the Lake are 745.8 and 746.0, respectively, and is generally equalized with Lake 4.



Figure 3-6  
Pond No. 7

## 3.2 EXISTING CONDITIONS XP SWMM INPUT

### 3.2.1 WATERSHED DELINEATION

Watershed boundaries were delineated using the 2-foot contour topographic data developed by DuPage County and review of City provided plans. The watershed boundary map is included as Exhibit 3. Hydrologic parameters were calculated for each subbasin based on current land use in conjunction with ISWS Bulletin 70 rainfall data and Huff rainfall distributions. The total tributary area studied is approximately 1,240 acres up to the upstream limit of Windsor Channel, consisting mainly of residential areas. This total tributary area includes the Williston Basin that was previously studied by V3 Companies.

### 3.2.2 STORM SEWER INPUT AND SURVEY

The 48-inch to 54-inch storm sewer between Roosevelt Road and Lake A was surveyed (Appendix 1). This storm sewer flows from north to south along President Street and then traverses east along Coolidge Avenue. There are two inflows into Lake A from the 54-inch storm sewer that flows along Coolidge Avenue north of Lake A. This storm sewer then continues south where it enters an overflow weir structure along the southeast side of Lake A. At this location, the storm sewer continues in a southwardly direction and overflows are directed toward Lake A via a spillway. Flows from this portion are then conveyed southwardly toward the remaining in-line lake system via a storm sewer system that outlets into Windsor Channel. This storm sewer system varies in diameter from a 36-inch to a 72-inch, according to the survey. In addition to the main line conveyance sewer, the five in-line lakes were also surveyed. The surveyed portion of storm sewer and lake system is highlighted on Exhibit 5.

Due to the complexity of the hydraulic modeling and overland flow paths that were observed, additional storm sewers were input into the model. The data used for these sewers is based on atlases and plans that were received by the City, DuPage County 2-foot aerial topography, field observations, and surveyed overland flow routes. Using the County topographic data, plans, atlases and the survey data an XP Software Stormwater and Wastewater Management

Model (XP-SWMM) of the drainage system was developed. The modeling input/output is included in Appendix 4.

### 3.2.3 TAILWATER CONDITIONS

The Briarcliffe Lakes storm sewer system outlets directly into the Windsor Channel located just north of Butterfield Road. Based on conversations with the City, Butterfield Road does not overtop. Therefore, it was determined that the tailwater condition of the sewer system upstream of Windsor Avenue is not sensitive to the elevation within Windsor Channel.

The existing conditions XP-SWMM was used to determine the capacity of the existing storm sewer system. The following is a description of the existing drainage system and results of the existing conditions XP-SWMM modeling.

## 3.3 SUMMARY OF EXISTING CONDITIONS

### 3.3.1 NORTH OF LAKE A

The northern portion of the watershed located north of Lake A has a different critical duration event than the area south of Lake A, including Lake A. This means that the historic “peak elevations” were not necessarily caused by the same storm. This is due to the in-line lake system. While the main conveyance sewer was surveyed and modeled in detail, there is another sewer system that flows east along Pershing Avenue and then south along Prospect Avenue and ties into the 54-inch conveyance sewer at the northeast corner of Lake A. This sewer system was not modeled with field survey data, but has been included in the hydraulic analysis to account for overland flow and areas that are not directly tributary to the conveyance sewer. The information from these sewers was assumed based on the field survey of the most downstream structure, the V3 invert of the most upstream structure, DuPage County 2-foot topography and the City sewer atlas. Based on this information, this storm sewer was incorporated into the modeling. This sewer system is shown on Figure 3-7.

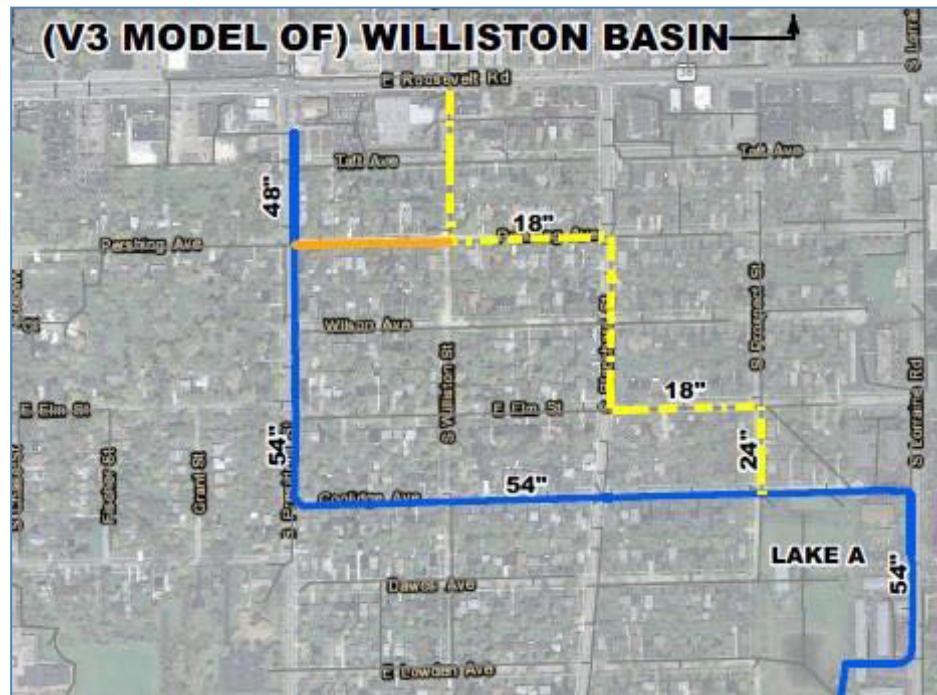


Figure 3-7 Modeled Network North of Lake A

This northern area, including the Williston Basin, consists of approximately 326 acres. As previously mentioned, a portion of this flow is conveyed around Lake A with three distinct inflow locations: a 24-inch storm sewer at the northwest corner of the basin, a 24-inch storm sewer at the northeast corner of the basin and an overflow weir at the southeast corner of the basin. There is a low point in the parking lot of the residential buildings located along the eastern side of Lake A, which, in extreme events could overtop into Lake A via overland, as shown on Exhibit 4.

Observations from the existing conditions analysis are provided below:

- The watershed located north of Lake A has a separate critical duration (1-hour) than the remaining portion of the watershed (24-hour).
- Lake A has a low flow pump station that was not included in the XP-SWMM analysis since flood levels would not be impacted.
- Insufficient stormwater storage volume exists within the upper portion of the watershed.
- The XP-SWMM model shows that Lake A reaches a peak 100-year elevation of 753.8 feet and a peak 50-year elevation of 753.1 feet.
- The April 2013 storm event was used as a calibration storm event. This inundation boundary is included as Exhibit 6.
- The critical duration of the watershed north of Lake A is generally the 2-hour storm duration, as shown in Table 3-1 below.

Location	April 2013	1 hour	2 hour	3 hour	6 hour	12 hour	18 hour	24 hour	48 hour	72 hour
Pershing Ave & President St	759.51	<b>761.63</b>	761.35	760.64	758.78	757.84	757.49	757.32	755.36	753.72
Wilson Ave & President St	759.42	<b>761.67</b>	761.37	760.62	758.61	757.66	757.31	757.14	755.14	753.51
Coolidge Ave & President St	759.28	<b>761.30</b>	761.03	760.23	758.10	757.14	756.80	756.60	754.59	753.01
Blanchard Ave & Wilson Ave	758.57	758.62	<b>758.65</b>	758.62	758.57	758.54	758.51	758.50	758.36	758.23
Coolidge Ave & Prospect St	754.12	<b>755.05</b>	753.78	753.41	752.51	752.91	752.97	753.09	752.00	751.06

Table 3-1 100-year Critical Duration Summary – North of Lake A

### 3.3.2 SOUTH OF LAKE A (INCLUDING LAKE A)

The portion of the watershed located south of Coolidge Avenue has a different critical duration than the area to the north. This is due in part to the large storage basins (Briarcliff Lake system) located south of Coolidge Avenue. The main conveyance line from Lake A to the outlet of Windsor Channel was surveyed, including the in-line lake system. There are several other inflows into the lake system, and a portion of these storm sewers have been included in the XP-SWMM analysis to account for overland flow and areas that are not directly tributary to the conveyance sewer. The information from these sewers was received by the city and incorporated into the modeling. A schematic of the storm sewer system that is included in the modeling is shown on Figure 3-8. Exhibit 5 shows the entire sewer system that is modeled within the watershed.

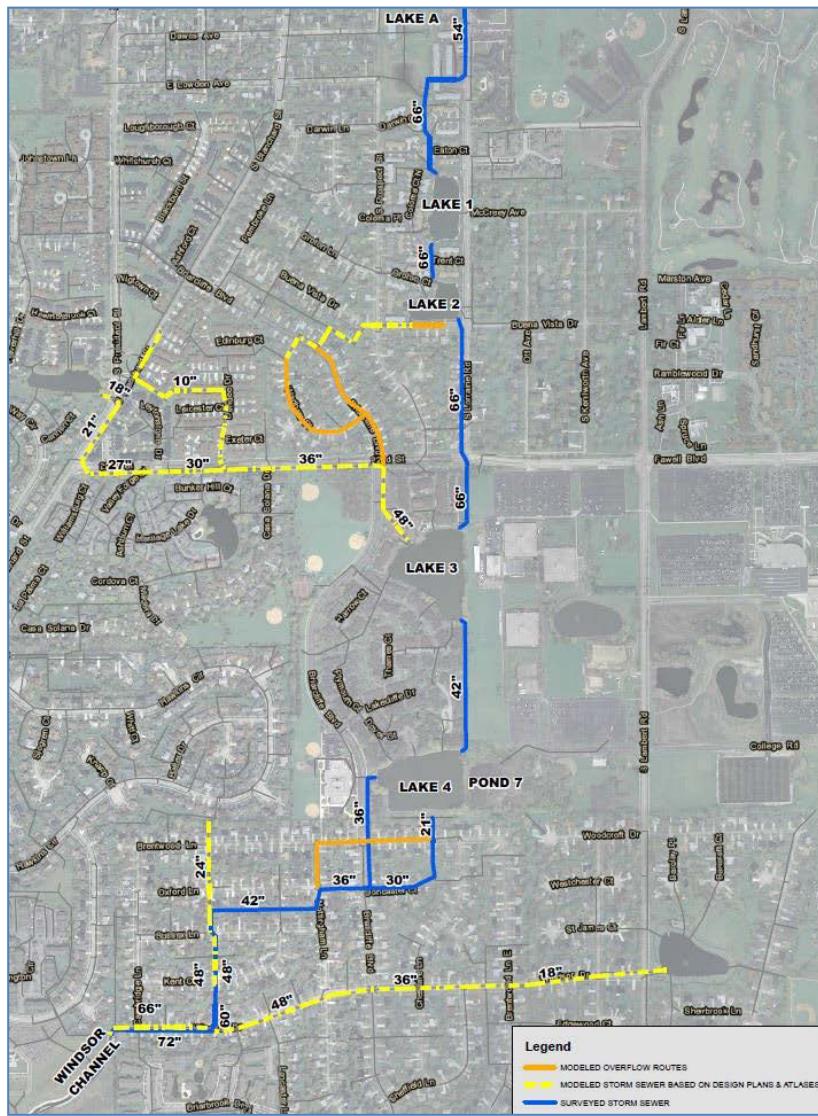


Figure 3-8 Modeled Network South of Lake A

This southern area, including Lake A, consists of approximately 1,057 acres. The main conveyance sewer flows from Lake A southwardly through the in-line lake system to Lake 4. In large storm events, Lakes 1 and 2 will become hydraulically connected via overland flow as both basins will overtop towards the east into Lorraine Road. Additionally in large storm events, Lakes 3 and 4 will also become hydraulically connected via overland flow. Lake 3 overtops towards the east where there is an overflow conveyance swale that is directly tributary to the northern side of Lake 4/Pond 7. Based on the DuPage County 2-foot topography, it appears that the COD campus has significant storage volume within the parking lot located east of Lake 3. Site visits indicate that there is a significant amount of work being performed on the COD campus. While there is no mapped floodplain in this area and compensatory storage volume would not be required, if Lake 3 overtops, the storage volume that was provided in this parking lot may have been affected by the improvements on the COD campus. Once construction is complete, it should also be verified that the existing overflow

route between Lake 3 and Lake 4 has adequate capacity to convey the overflow towards Lake 4/Pond 7.

South of Lake 4, the storm sewer system located downstream then conveys flows to Windsor Channel. Also incorporated into the model is the “Build Illinois” 100-year storm sewer that was constructed circa 1987 in addition to the Foxcroft Subdivision tributary area and storage basin. Lake 4 drains through a 21” reinforced concrete pipe (RCP) located in a slope box on the western side of the lake. It is understood that any overflows from Lake 4 were intended to flow over the western embankment; however, no overflow route currently exists. Based on the survey of the southern berm, once Lake 4/Pond 7 reaches elevation 745.35', water flows over the southern berm. This water will collect in the rear yards of the homes located on Brentwood Lane, east of Briarcliffe Boulevard. Based on the XP-SWMM analysis, the storm sewer system east of Briarcliffe Boulevard lacks adequate capacity to convey the flow downstream, thus surcharging and flooding occurs in this neighborhood. It was determined that the area south of Lake A has three separate critical durations: between Lake A and Lake 4 is the 24-hour; between, and including, Lake 4 and Nottingham Lane and Oxford Lane is the 48-hour and downstream of Sussex Lane is the 1-hour. The 120-hour duration storm event was also simulated, but is not being reported in Table 3-3 as it was determined that this event was not the critical event for an area within the watershed.

Observations from the existing conditions analysis are provided below:

- Lakes 1 and 2 become hydraulically connected via Lorraine Road once overtopping begins.
- There is no overland flow route southward through the side yards of the homes 1517 and 1535 Briarcliffe Boulevard.
- Significant storage volume is provided in the COD property located east of Lake 3.
- Lakes 3 and 4 become hydraulically connected once overtopping begins.
- Insufficient storage volume exists within the upper portion of the watershed.
- The April 2013 storm event was used as a calibration storm event. This inundation boundary is included as Exhibit 6.
- 43 homes can experience overland flooding in the 100-year critical duration storm event.
- Three separate critical durations exist for the watershed south of Lake A: the 24-hour between Lake A and Lake 4, the 48-hour between and including Lake 4 and Nottingham Lane/Oxford Lane, and downstream of Sussex Lane is the 1-hour, as shown in Table 3-4 and is mapped on Exhibit 7.

Location	April 2013	1 hour	2 hour	3 hour	6 hour	12 hour	18 hour	24 hour	48 hour	72 hour
Lake 1	749.62	746.90	748.41	749.00	749.78	750.15	750.18	<b>750.26</b>	750.03	749.70
1544 Briarcliff Blvd	750.0	<b>750.38</b>	748.89	748.60	749.33	749.78	749.81	749.86	749.70	749.36
Lake 2	749.66	746.63	747.99	748.54	749.33	749.87	749.92	<b>750.03</b>	749.73	749.34
Briarcliff Blvd & 22 <sup>nd</sup> St	748.61	<b>748.82</b>	747.49	747.94	748.26	748.33	748.40	748.40	748.34	748.27
Lake 3	748.48	746.23	746.73	747.44	747.94	748.06	748.15	<b>748.18</b>	748.06	747.97
Lake 4	745.88	743.20	745.08	745.52	745.68	745.74	745.84	745.99	<b>746.42</b>	745.90
1730 Brentwood Ln	745.88	743.38	743.17	742.85	745.57	745.76	745.96	746.14	<b>746.42</b>	746.06
1898 Briarcliff Blvd	745.54	743.34	742.891	742.16	745.10	745.35	745.65	745.88	<b>746.00</b>	745.81
Rear Yard of 1892 Briarcliff Blvd	745.54	743.24	742.47	741.85	744.36	745.31	745.67	745.91	<b>746.00</b>	745.82
Rear Yard 1220 Sussex Ln	740.41	740.30	740.08	739.96	739.25	740.36	740.45	740.53	<b>740.55</b>	740.51
Windsor Channel	731.89	<b>732.22</b>	732.07	731.91	731.75	731.51	731.44	731.48	731.63	731.43

Table 3-3 100-year Critical Duration Summary South of Lake A

A survey of 52 homes was performed to determine the low entry elevation. It was determined that 43 homes will experience overland flooding in the 100-year critical storm event. A summary of the homes that have low entry elevations lower than the 100-year event is included as Table 3-4 and a complete summary, including all surveyed structures, is included in Appendix 2. Table 3-5 gives the 5- through 500-year flood event elevations at the homes flooded for the 100-year.

Address	Low Entry Location	Low Entry Elevation (NAVD88)	Finished Floor Elevation (NAVD88)	100 Year Storm Elevation (NAVD88)
1619 BRENTWOOD LANE	F. F. Garage	745.55	746.11	746.4
1636 BRENTWOOD LANE	F. F. Garage	745.57	749.34	746.4
1639 BRENTWOOD LANE	Well Top	746.36	747.62	746.4
1660 BRENTWOOD LANE	F. F. Garage	745.88	746.40	746.4
1663 BRENTWOOD LANE	Well Top	746.01	747.35	746.4
1684 BRENTWOOD LANE	F. F. Garage	744.77	749.33	746.4
1687 BRENTWOOD LANE	F. F. Garage	745.13	749.76	746.4
1706 BRENTWOOD LANE	F. F. Rear Door	744.33	748.06	746.4
1709 BRENTWOOD LANE	F. F. Garage	744.22	744.69	746.4
1730 BRENTWOOD LANE	F. F. Garage	743.71	748.39	746.4
1733 BRENTWOOD LANE	F. F. Garage	745.25	746.54	746.4
1755 BRENTWOOD LANE	Top of Found.	742.19	745.90	746.4
1770 BRENTWOOD LANE	F. F. Garage	744.47	745.66	746.4
1775 BRENTWOOD LANE	Well Top	744.39	746.23	746.4
1795 BRENTWOOD LANE	F. F. Rear Door	743.94	747.47	746.4
1845 BRENTWOOD LANE	F. F. Rear Door	745.48	749.06	746.4
1590 BRENTWOOD LANE	Rear Door	745.12	748.87	746.0
1872 BRIARCLIFFE BLVD	F. F. Garage	744.63	749.32	746.0
1876 BRIARCLIFFE BLVD	F. F. Garage	745.10	746.28	746.0
1884 BRIARCLIFFE BLVD	Well Top	744.66	746.36	746.0
1892 BRIARCLIFFE BLVD	F. F. Garage	745.56	746.51	746.0
1898 BRIARCLIFFE BLVD	F. F. Rear Door	743.74	747.37	746.0
1904 BRIARCLIFFE BLVD	F. F. Garage	743.92	744.41	746.0
1910 BRIARCLIFFE BLVD	F. F. Garage	744.63	749.23	746.0
1865 NOTTINGHAM LANE	Well Top	745.71	747.16	746.0
1879 NOTTINGHAM LANE	F. F. Garage	744.38	749.04	746.0
1885 NOTTINGHAM LANE	Well Top	743.49	744.60	746.0
1891 NOTTINGHAM LANE	F. F. Rear Door	743.47	747.03	746.0
1897 NOTTINGHAM LANE	F. F. Garage	745.60	746.70	746.0
1903 NOTTINGHAM LANE	F. F. Garage	745.77	750.56	746.0
1879 BRIARCLIFFE BLVD	Well Top	744.70	745.87	746.0
1891 DONCASTER COURT	Well Top	744.48	746.07	746.2
1895 DONCASTER COURT	Well Top	745.34	746.46	746.2
1885 CHESHIRE LANE	F. F. Rear Door	744.20	747.74	746.2
1880 CHESHIRE LANE	Well Top	744.50	746.26	746.2
1888 CHESHIRE LANE	F. F. Rear Door	740.95	747.89	746.2

Address	Low Entry Location	Low Entry Elevation (NAVD88)	Finished Floor Elevation (NAVD88)	100 Year Storm Elevation (NAVD88)
1899 DONCASTER COURT	F. F. Garage	745.15	745.71	746.2
1902 DONCASTER COURT	Well Top	745.89	747.06	746.2
1906 DONCASTER COURT	Well Top	745.82	747.29	746.2
1908 DONCASTER COURT	Well Top	745.80	746.92	746.2
1887 BRIARCLIFFE BLVD	F. F. Rear Door	744.73	748.31	746.0
1911 BRIARCLIFFE BLVD	Well Top	745.39	747.23	746.0
1913 BRIARCLIFFE BLVD	F. F. Garage	744.60	749.25	746.0

Table 3-4 Low Entry vs. 100-year, 48-hour Water Surface Elevation (WSEL) Summary

Address	Low Entry Elevation (NAVD88)	5 Year Storm Elevation (NAVD88)	10 Year Storm Elevation (NAVD88)	25 Year Storm Elevation (NAVD88)	50 Year Storm Elevation (NAVD88)	500 Year Storm Elevation (NAVD88)
1616 BRENTWOOD LANE	747.26	738.6	744.8	745.7	746.0	747.6
1619 BRENTWOOD LANE	745.55	738.6	744.8	745.7	746.0	747.6
1636 BRENTWOOD LANE	745.57	738.6	744.8	745.7	746.0	747.6
1639 BRENTWOOD LANE	746.36	738.6	744.8	745.7	746.0	747.6
1660 BRENTWOOD LANE	745.88	738.6	744.8	745.7	746.0	747.6
1663 BRENTWOOD LANE	746.01	738.6	744.8	745.7	746.0	747.6
1684 BRENTWOOD LANE	744.77	738.6	744.8	745.7	746.0	747.6
1687 BRENTWOOD LANE	745.13	738.6	744.8	745.7	746.0	747.6
1706 BRENTWOOD LANE	744.33	738.6	744.8	745.7	746.0	747.6
1709 BRENTWOOD LANE	744.22	738.6	744.8	745.7	746.0	747.6
1730 BRENTWOOD LANE	743.71	738.6	744.8	745.7	746.0	747.6
1733 BRENTWOOD LANE	745.25	738.6	744.8	745.7	746.0	747.6
1755 BRENTWOOD LANE	742.19	738.6	744.8	745.7	746.0	747.6
1770 BRENTWOOD LANE	744.47	738.6	744.8	745.7	746.0	747.6
1775 BRENTWOOD LANE	744.39	738.6	744.8	745.7	746.0	747.6
1795 BRENTWOOD LANE	743.94	738.6	744.8	745.7	746.0	747.6
1821 BRENTWOOD LANE	746.56	738.6	744.8	745.7	746.0	747.6
1845 BRENTWOOD LANE	745.48	738.6	744.8	745.7	746.0	747.6
1855 BRENTWOOD LANE	747.92	738.6	744.8	745.7	746.0	747.6
1865 CHESHIRE LANE	746.46	738.6	744.8	745.7	746.0	747.6
1585 BRENTWOOD LANE	747.52	740.5	743.2	745.2	745.6	747.0
1590 BRENTWOOD LANE	745.12	740.5	743.2	745.2	745.6	747.0

Address	Low Entry Elevation (NAVD88)	5 Year Storm Elevation (NAVD88)	10 Year Storm Elevation (NAVD88)	25 Year Storm Elevation (NAVD88)	50 Year Storm Elevation (NAVD88)	500 Year Storm Elevation (NAVD88)
1872 BRIARCLIFFE BLVD	744.63	737.8	740.6	744.8	745.6	747.0
1876 BRIARCLIFFE BLVD	745.10	737.8	740.6	744.8	745.6	747.0
1884 BRIARCLIFFE BLVD	744.66	737.8	740.6	744.8	745.6	747.0
1892 BRIARCLIFFE BLVD	745.56	737.8	740.6	744.8	745.6	747.0
1898 BRIARCLIFFE BLVD	743.74	737.8	740.6	744.8	745.6	747.0
1904 BRIARCLIFFE BLVD	743.92	737.8	740.6	744.8	745.6	747.0
1910 BRIARCLIFFE BLVD	744.63	737.8	740.6	744.8	745.6	747.0
1865 NOTTINGHAM LANE	745.71	737.8	740.6	744.8	745.6	747.0
1879 NOTTINGHAM LANE	744.38	737.8	740.6	744.8	745.6	747.0
1885 NOTTINGHAM LANE	743.49	737.8	740.6	744.8	745.6	747.0
1891 NOTTINGHAM LANE	743.47	737.8	740.6	744.8	745.6	747.0
1897 NOTTINGHAM LANE	745.6	737.8	740.6	744.8	745.6	747.0
1903 NOTTINGHAM LANE	745.77	737.8	740.6	744.8	745.6	747.0
1879 BRIARCLIFFE BLVD	744.70	744.9	744.9	745.4	745.6	747.2
1891 DONCASTER COURT	744.48	738.6	744.5	745.6	745.9	747.0
1895 DONCASTER COURT	745.34	738.6	744.5	745.6	745.9	747.0
1879 CHESHIRE LANE	746.57	738.6	744.5	745.6	745.9	747.0
1885 CHESHIRE LANE	744.20	738.6	744.5	745.6	745.9	747.0
1880 CHESHIRE LANE	744.50	738.6	744.5	745.6	745.9	747.0
1888 CHESHIRE LANE	740.95	738.6	744.5	745.6	745.9	747.0
1894 CHESHIRE LANE	746.41	738.6	744.5	745.6	745.9	747.0
1891 CHESHIRE LANE	747.06	738.6	744.5	745.6	745.9	747.0
1899 DONCASTER COURT	745.15	738.6	744.5	745.6	745.9	747.0
1902 DONCASTER COURT	745.89	738.6	744.5	745.6	745.9	747.0
1904 DONCASTER COURT	746.82	738.6	744.5	745.6	745.9	747.0
1906 DONCASTER COURT	745.82	738.6	744.5	745.6	745.9	747.0
1908 DONCASTER COURT	745.80	738.6	744.5	745.6	745.9	747.0
1887 BRIARCLIFFE BLVD	744.73	738.6	742.2	745.2	745.6	746.7
1911 BRIARCLIFFE BLVD	745.39	738.6	742.2	745.2	745.6	746.7
1913 BRIARCLIFFE BLVD	744.60	738.6	742.2	745.2	745.6	746.7

*Note: 500-year elevations are considered conservative as additional overflow routes at this higher flooding level were not surveyed.*

Table 3-5 Low Entry vs. various frequencies, 48-hour Water Surface Elevation (WSEL) Summary

South of Lake 4, an analysis was made to evaluate the various flood levels due to the different storm frequencies. Since this area has a critical duration of approximately the 48 hour storm, only the storm frequencies associated with this duration were analyzed.

Location	5 year	10 year	25 year	50 year	100 year	500 year
Lake 4	745.2	745.6	745.7	746.0	746.4	747.6
1730 Brentwood Ln	738.6	744.8	745.7	746.0	746.4	747.6
1887 Briarcliffe Blvd	738.6	742.2	745.2	745.6	746.0	746.7
Rear Yard of 1892 Briarcliffe Blvd	737.7	740.6	744.8	745.6	746.0	746.2
Rear Yard 1220 Sussex Ln	733.3	733.5	735.0	738.1	739.3	740.2

*Note: 500-year elevations are considered conservative as additional overflow routes at this higher flooding level were not surveyed.*

*Table 3-4 48-hour Flood Frequency Summary South of Lake 4*

**CHAPTER 4****PROPOSED CONDITIONS ANALYSIS**

Based on the results of the existing conditions analysis, proposed improvement alternatives were developed and evaluated with the goal of reducing the risk of future flooding at each identified flooding area. The tailwater condition used in proposed conditions is the same as existing conditions. The modeling input/output is included in Appendix 4.

**4.1 SUMMARY OF STUDY AREAS****4.1.1 NORTH OF LAKE A**

The area tributary to Lake A has a different critical duration (1-hour) than the areas south of Lake A (24-hour). Several ponding areas in this watershed were identified for the 1-hour storm event, as shown on Exhibit 8. **Because the primary focus of this study did not include the areas between Roosevelt Road and Lake A, no improvements have been recommended for this area.** Further analysis of the entire storm sewer system in this area would better define the flooding problems.

**4.1.2 SOUTH OF LAKE A**

The primary focus of this study was the residential neighborhood located south of Lake 4/Pond 7. Five stormwater improvements were analyzed and the projects and flood reduction benefits are described below.

These alternatives and their flood reduction benefits are described below.

***Alternative 1***

This alternative consists of the excavation of Briar Patch Park approximately 10 feet below its existing ground elevation to provide approximately 26 acre-feet of storage volume. This additional storage volume would be accessed via a 48-inch storm sewer providing a direct connection to Lake 3. Providing storage volume in this location not only provides flood reductions for the immediate vicinity, but benefits are realized from upstream at Lake A to downstream at Nottingham Lane. Outside of these two limits, the benefits, if any, are minimal. This proposed project flood elevation reduction benefits are summarized in Table 4-1.

Location	Baseline Elevation (NAVD 88)	Proposed Elevation (NAVD 88)	Change in Flood Elevation	Eliminates Street Ponding Risk?
1544 Briarcliffe Blvd	749.7	749.6	-0.1	No
Lake 2	749.7	749.6	-0.1	---
Briarcliffe Blvd & 22 <sup>nd</sup> St	748.3	748.3	0.0	No
Lake 3	748.1	748.0	-0.1	---
Lake 4	746.1	746.0	-0.1	---
1730 Brentwood Ln	746.2	746.1	-0.1	No
1898 Briarcliffe Blvd	746.0	745.9	-0.1	No
Rear Yard of 1892 Briarcliffe Blvd	746.0	745.9	-0.1	No
Rear Yard of 1220 Sussex Ln	740.6	740.5	-0.1	No
Windsor Channel	731.6	731.5	-0.1	---

**Table 4-1 Alternative 1 Flood Reduction Benefits (100-year, 48-hour Storm Event)**

### **Alternative 2**

This alternative was to evaluate the rehabilitation of the Lake 4 berm without any additional conveyance or storage within the system, to reestablish this historical drainage condition. In order to provide 0.7 foot of freeboard above the design HWL of 745.30, the berm was raised by 0.65 foot to the historical berm elevation of 746.0. It was determined that the project alone does not cause any measurable benefits downstream of Lake 4 and causes adverse impacts upstream of Lake 4 when compared to existing conditions, although it is noted that the settlement of the berm over its lifetime has in effect resulted in an upstream flood benefit. Because of this, this alternative by itself was not mapped or studied further.

### **Alternative 3**

This alternative evaluates the addition of a proposed storm sewer from Lake 3 to downstream of Lake 4 tying into the 42" storm sewer that traverses from east to west across Nottingham Lane and continues in easterly and southerly directions until its outlet into Windsor Channel. Based on the modeling results, it was concluded that this option does not provide any significant upstream or downstream benefits within any portion of the system.

### **Alternative 4**

This alternative consists of the addition of a 3.5' x 10' reinforced box culvert (RCBC) conveyance pipe from the low spot just west of Brentwood Lane and Cheshire Lane. This storm sewer would allow flood waters to be conveyed southerly along Cheshire Lane and the westerly along

Windsor Lane towards Windsor Channel, where the box culvert is increased in size to a 4' x 10' RCBC, replacing the existing storm sewer along Windsor Lane, that ultimately discharges as a 72" into Windsor Channel. This alternative provides flood reductions from south of Lake 3 to Windsor Channel without increasing the flood elevations within Windsor Channel more than 0.3 foot, but within the limits of the channel banks. Although there is a 0.3 foot increase in the flood elevation of Windsor Channel, it is below the 100-year critical elevation at this location. Greater increases within the channel may need to be evaluated if easements allow. However, authorization from the Forest Preserve District will be required for any increases in Rice Lake. This proposed project flood reduction benefits are summarized in Table 4-2.

Location	Baseline Elevation (NAVD 88)	Proposed Elevation (NAVD 88)	Change in Flood Elevation	Eliminates Street Ponding Risk?
1544 Briarcliff Blvd	749.7	749.7	0.0	No
Lake 2	749.7	749.7	0.0	---
Briarcliff Blvd & 22 <sup>nd</sup> St	748.3	748.3	0.0	No
Lake 3	748.1	748.1	0.0	---
Lake 4	746.1	745.8	-0.3	---
1730 Brentwood Ln	746.2	741.7	-4.5	Yes
1898 Briarcliff Blvd	746.0	741.5	-4.5	Yes
Rear Yard of 1892 Briarcliff Blvd	746.0	740.5	-5.5	Yes
Rear Yard of 1220 Sussex Ln	740.6	737.3	-3.3	Yes
Windsor Channel	731.6	731.9	+0.3	---

Table 4-2 Alternative 4 Flood Reduction Benefits (100-year, 48-hour Storm Event)

### Alternative 5

This alternative is a combination of Alternatives 1 and 4. This alternative would provide for additional storage within the watershed and a bypass pipe. While there are several reductions in HWL elevations, street ponding risk is not eliminated throughout the system. The benefits extend from the intersection of Coolidge Avenue and Blanchard Street downstream to through the outlet pipe from Briarcliff Lakes Subdivision to Windsor Channel. Although there is a 0.3 foot increase in the flood elevation of Windsor Channel, it is below the 100-year critical elevation at this location. However, authorization from the Forest Preserve District will be required for any increases in Rice Lake. This proposed project is shown on Exhibit 8 and the benefits are summarized in Table 4-3. A CD-ROM containing the XP-SWMM files is included in Appendix 4.

Location	Baseline Elevation (NAVD 88)	Proposed Elevation (NAVD 88)	Change in Flood Elevation (ft)	Eliminates Street Ponding Risk?
1544 Briarcliffe Blvd	749.7	749.6	-0.1	No
Lake 2	749.7	749.6	-0.1	---
Briarcliffe Blvd & 22 <sup>nd</sup> St	748.3	748.3	0.0	No
Lake 3	748.1	748.0	-0.1	---
Lake 4	746.1	745.5	-0.6	---
1730 Brentwood Ln	746.2	741.5	-4.7	Yes
1898 Briarcliffe Blvd	746.0	741.3	-4.7	Yes
Rear Yard of 1892 Briarcliffe Blvd	746.0	740.3	-5.7	Yes
Rear Yard of 1220 Sussex Ln	740.6	737.2	-3.4	Yes
Windsor Channel	731.6	731.9	+0.3	---

Table 4-3 Alternative 5 Flood Reduction Benefits (100-year, 48-hour Storm Event)

### Alternative 6 (Buyouts)

Given the challenging aspects of providing additional storage and the significant cost of a bypass pipe, the alternative where the affected properties are acquired as buyouts on a voluntary basis is provided. This project is summarized in Table 4-4. The fair market value is based on DuPage County's website values. The DuPage County Fair Cash Value is taken from the DuPage County website, and the estimated fair market value is 3 times the "Fair Cash Value". The amount to demolish and restore is estimated to be between \$20,000 and \$30,000, and \$30,000 was used for cost purposes. This does not include any regrading of the site other than what would be incidental to the demolishing. The total cost of this alternative is the sum of \$13,400,000 and \$1,290,000, which is equal to \$14,690,000.

Address	DuPage County Fair Cash Value (\$)	Estimated Fair Market Value (\$)	Demolish/Restore Cost (based on City records for demolished homes)
1590 Brentwood Ln	106,060	318,180	30,000
1619 Brentwood Ln	91,894	275,682	30,000
1636 Brentwood Ln	105,383	316,149	30,000
1639 Brentwood Ln	91,076	273,228	30,000
1660 Brentwood Ln	95,795	287,385	30,000
1663 Brentwood Ln	116,419	349,257	30,000
1684 Brentwood Ln	95,570	286,710	30,000
1687 Brentwood Ln	94,949	284,847	30,000
1706 Brentwood Ln	104,265	312,795	30,000
1709 Brentwood Ln	94,056	282,168	30,000
1730 Brentwood Ln	100,166	300,498	30,000
1733 Brentwood Ln	107,649	322,947	30,000
1755 Brentwood Ln	104,791	314,373	30,000
1770 Brentwood Ln	117,772	353,316	30,000
1775 Brentwood Ln	108,269	324,807	30,000
1795 Brentwood Ln	107,479	322,437	30,000
1845 Brentwood Ln	93,780	281,340	30,000
1865 Nottingham Ln	131,092	393,276	30,000
1872 Briarcliff Blvd	116,945	350,835	30,000
1876 Briarcliff Blvd	88,830	266,490	30,000
1879 Briarcliff Blvd	96,650	289,950	30,000
1879 Nottingham Ln	93,887	281,661	30,000
1880 Cheshire Ln	109,632	328,896	30,000
1884 Briarcliff Blvd	105,233	315,699	30,000
1885 Cheshire Ln	105,120	315,360	30,000
1885 Nottingham Ln	97,580	292,740	30,000

1887 Briarcliffe Blvd	105,524	316,572	30,000
1888 Cheshire Ln	106,521	319,563	30,000
1891 Nottingham Ln	99,790	299,370	30,000
1891 Doncaster Ct	107,489	322,467	30,000
1892 Briarcliffe Blvd	114,971	344,913	30,000
1895 Doncaster Ct	110,187	330,561	30,000
1897 Nottingham Ln	107,470	322,410	30,000
1898 Briarcliffe Blvd	106,295	318,885	30,000
1899 Doncaster Ct	102,319	306,957	30,000
1902 Doncaster Ct	110,930	332,790	30,000
1903 Nottingham Ln	95,307	285,921	30,000
1904 Briarcliffe Blvd	92,665	277,995	30,000
1906 Doncaster Ct	112,462	337,386	30,000
1908 Doncaster Ct	91,396	274,188	30,000
1910 Briarcliffe Blvd	98,070	294,210	30,000
1911 Briarcliffe Blvd	126,684	380,052	30,000
1913 Briarcliffe Blvd	98,380	295,140	30,000
<b>TOTAL</b>	<b>4,470,000</b>	<b>13,400,000</b>	<b>1,290,000</b>

Table 4-4 Buyouts Summary

**CHAPTER 5****CONCLUSIONS AND RECOMMENDATIONS****5.1 CONCLUSIONS**

The improvement alternatives discussed in the previous chapter were evaluated to determine if there were benefits to areas that experience flooding problems as identified by the City of Wheaton and through the existing conditions XP-SWMM analysis. The primary focus was to reduce flooding within the Briarcliffe Lakes Subdivision. This was demonstrated in the XP-SWMM computer modeling described in Chapter 3, EXISTING CONDITIONS ANALYSIS and Chapter 3, PROPOSED CONDITIONS ANALYSIS.

**5.2 RECOMMENDATIONS****5.2.1 NORTH OF LAKE A**

Since this area was not the primary focus of this study, no alternatives were analyzed or recommended. If any future work is to take place within this portion of the watershed, it is recommended that further additional field survey be performed of the sewer network that is tributary to Lake A.

**5.2.2 SOUTH OF LAKE A**

The main focus of the improvements was the residential neighborhood located downstream of Lake 4. Five alternatives were evaluated to determine what projects could be implemented to provide flood reduction benefits within the Briarcliffe Subdivision. Five alternatives, which consisted of various storage and conveyance components, were evaluated, plus a sixth alternative which consisted of buyouts of the affected properties. The hydraulic analysis of each alternative, unless otherwise mentioned, does not include the possible improvement of the Lake 4 berm as may be required by Illinois Department of Natural Resources – Office of Water Resources (IDNR-OWR). Any modification to the berm will require additional survey, coordination with the College of DuPage (COD), and permitting through IDNR-OWR. It is recommended that this berm be raised approximately 0.65', to elevation 746.0, which is the historical required berm height. This improvement in addition to other improvements listed allows for additional available storage within the lake without causing negative upstream impacts. IDNR-OWR issued a May 10, 2013 letter to the Briarcliffe Lakes Homeowners Association (BLHA) requiring a dam safety permit for Lake No.4. Responding to this letter was not part of this study, but the modeling performed for this study can serve as the hydrologic and hydraulic basis for a response.

Alternatives 1 through 4 did not explicitly model the rehabilitation of the berm, but Alternative 5 did. It was determined that if Alternative 5 is constructed and the berm is rehabilitated, there will be no adverse impacts to the upstream watershed. While the flood storage component of this project does not increase the level of protection significantly, storage volume will need to be provided within the watershed for future flood control projects that

strive to provide a 100-year level of protection. The feasibility of obtaining storage within the watershed is low given the lack of open space in low areas. Alternative 4 is the most cost-effective alternative that provides significant benefits; however, there are downstream impacts of 0.3 feet at the Windsor Channel that are contained within easements. Windsor Channel discharges into Rice Lake, a large lake within the DuPage County Forest Preserve District. Any possible impacts to Rice Lake will need to be studied further with the Forest Preserve.

The studied alternatives are summarized in Table 5-1 and the recommended project is included as Table 5-2.

Alternative ID	Project Components	Cost	Comments
Alternative 1	<ul style="list-style-type: none"> <li>Excavation of Briar Patch Park</li> <li>Installation of a 48" equalizer pipe connecting Briar Patch Park to Lake 3.</li> </ul>	\$6.90 million	<ul style="list-style-type: none"> <li>Storage basin is proposed within Park District Property.</li> <li>A detailed survey of Briarcliffe Boulevard will need to be performed to determine invert elevations of the equalizer pipe.</li> </ul>
Alternative 2	<ul style="list-style-type: none"> <li>Rehabilitation of Lake 4 southern berm by raising it to elevation 746.0</li> </ul>	\$380,000 (does not include cost to meet IDNR-OWR requirements – still need to be defined)	<ul style="list-style-type: none"> <li>Requires coordination with the College of DuPage.</li> <li>Requires IDNR-OWR permitting.</li> <li>Does not have significant flood reduction benefits</li> <li>Settlement of the Lake 4 berm has caused upstream benefits</li> </ul>
Alternative 3	<ul style="list-style-type: none"> <li>Installation of a bypass sewer from Lake 3 to downstream of Lake 4 at Nottingham Lane</li> </ul>	\$3.46 million	<ul style="list-style-type: none"> <li>Full street topographic survey would be required to determine the feasibility of this project.</li> <li>Bypassing a portion of the flow tributary to Lake 4 does not have any significant benefits to the study area.</li> </ul>
Alternative 4	<ul style="list-style-type: none"> <li>Installation of a 4'x10' RCBC bypass sewer from Brentwood Lane/Cheshire Lane to Windsor Channel</li> </ul>	\$10.43 million	<ul style="list-style-type: none"> <li>The existing 72" storm sewer along Windsor Ave is replaced with a 4' x 10' RCBC along Windsor Lane.</li> <li>Provides a significant reduction in flooding in the 100-year critical storm event.</li> <li>Will require authorization by the Forest Preserve District for any flood increases in Rice Lake.</li> </ul>

Alternative 5	<ul style="list-style-type: none"> <li>• Create 26 acre-feet of flood storage by excavating the existing Briar Patch Park</li> <li>• Rehabilitate the Lake 4/Pond 7 southern berm</li> <li>• Installation of a 3.5' x 10' RCBC bypass sewer from Brentwood Lane/Cheshire Lane intersection south to Windsor Ave ultimately discharging to Windsor Channel</li> </ul>	\$17.23 million	<ul style="list-style-type: none"> <li>• Storage basin is proposed within Park District Property.</li> <li>• A detailed survey of Briarcliffe Boulevard will need to be performed to determine invert elevations of the equalizer pipe.</li> <li>• The existing 72" storm sewer along Windsor Ave is replaced with a 4' x 10' RCBC along Windsor Lane.</li> <li>• Provides a significant reduction in flooding in the 100-year critical storm event.</li> <li>• Will require authorization by the Forest Preserve District for any flood increases in Rice Lake.</li> </ul>
Alternative 6	<ul style="list-style-type: none"> <li>• Buyout and demolish 43 affected properties</li> </ul>	\$14.69 million	<ul style="list-style-type: none"> <li>• Costs includes demolishing and administrative costs</li> <li>• Costs do not include any special remediation structures.</li> <li>• Will require voluntary buyouts from the affected property owners</li> <li>• If FEMA/IEMA funds are used, restrictions on use may be imposed</li> <li>• Will eliminate structural flooding for all homes participating in the buyout</li> </ul>

Table 5-1 Alternative Analysis Summary

### 5.2.3 SUMMARY OF RECOMMENDATIONS

Study Area	Recommended Project	Cost	Level of Protection	Comments
Alternative 4	<ul style="list-style-type: none"> <li>• Installation of a 4'x10' RCBC bypass sewer from Brentwood Lane/Cheshire Lane to Windsor Channel</li> </ul>	\$10.43 million	100-year	<ul style="list-style-type: none"> <li>• The existing 72" storm sewer along Windsor Ave is replaced with a 4' x 10' RCBC along Windsor Lane.</li> <li>• Provides a significant reduction in flooding in the 100-year critical storm event.</li> <li>• Will require authorization by the Forest Preserve District for any flood increases in Rice Lake.</li> </ul>

<sup>1</sup>The cost to rehabilitate the southern berm is not included in this Alternative. Additional survey will need to be performed to determine the extent of the berm rehabilitation. The cost of permitting is also not included in this estimate.

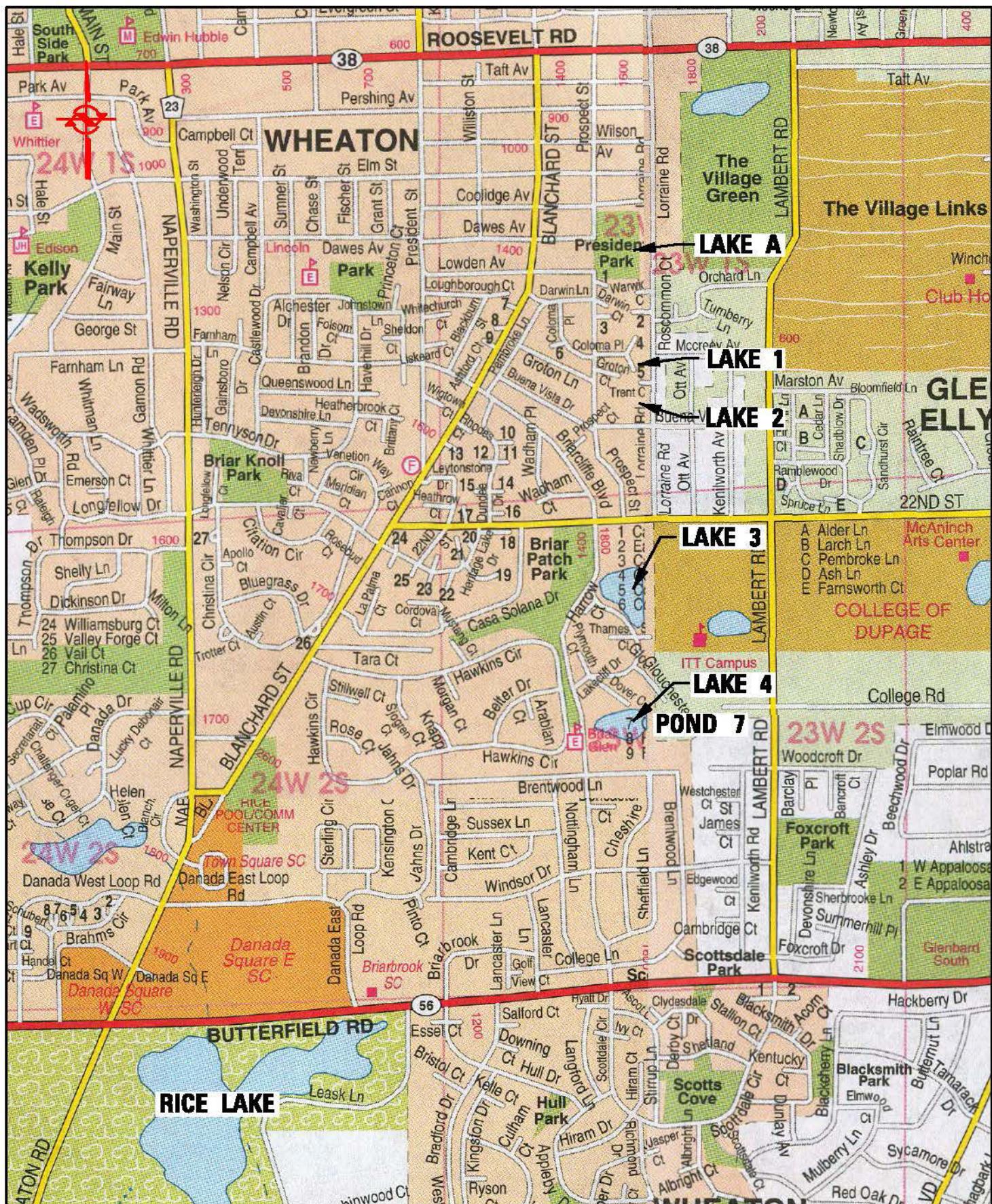
Table 5-2 Recommendation Summary



N:\WHEATON\130480\Admin\March 2015 Report\R1 Briarcliffe Lakes Flood Study 030915\_TEXT ONLY.docx



Christopher B. Burke Engineering, Ltd.



CLIENT:

**CITY OF WHEATON**

TITLE:

**LOCATION MAP**

PROJ. NO. 130480

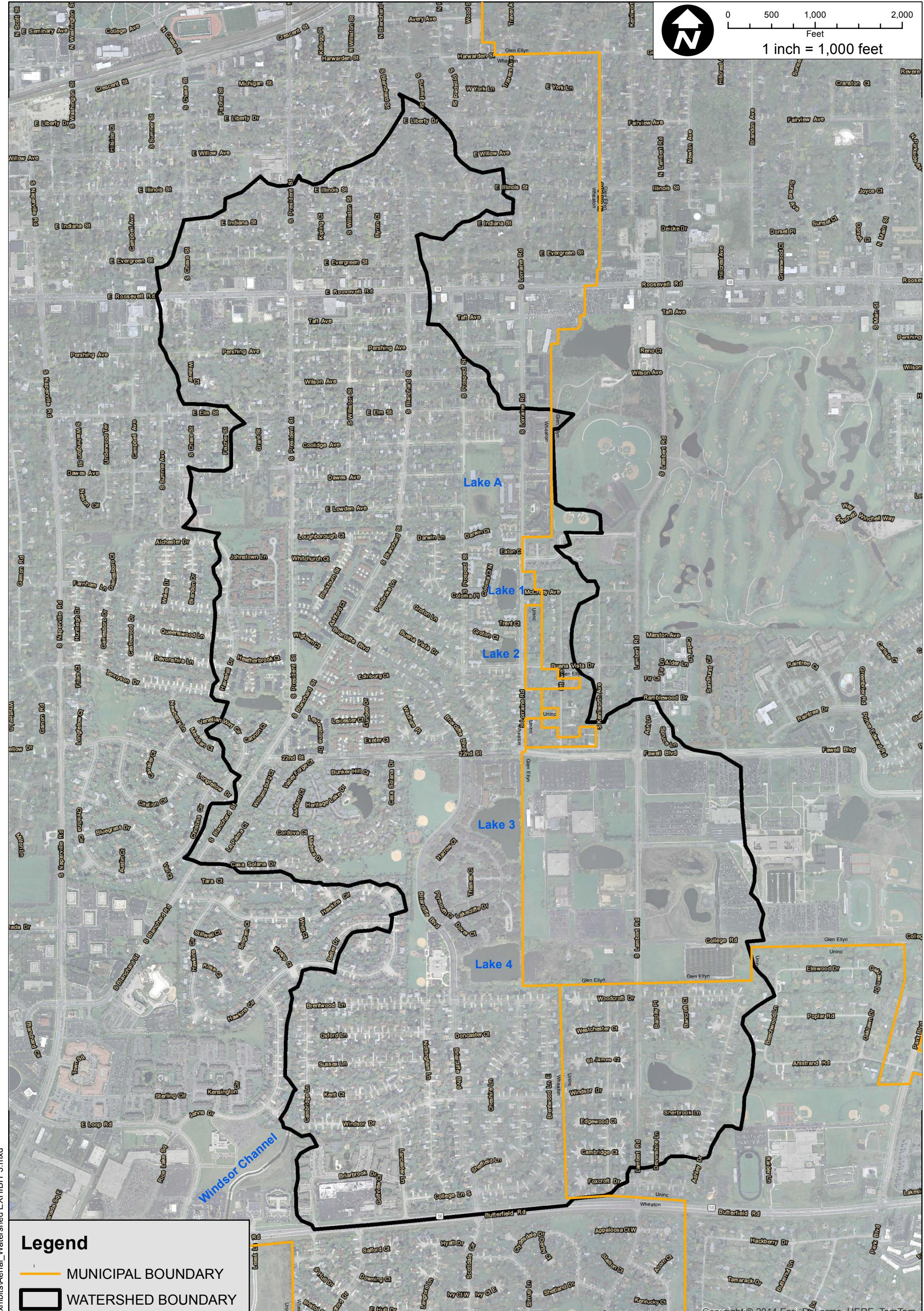
DATE: 1/22/2015

HEET OF

DRAWING NO.

DSGN.	JMC	SCALE:	1500'
DWN.	EAT	MODEL:	Model
CHKD.		PLOT DATE:	1/22/2015
FILE:	130480exh1 Location Map		





CLIENT:

TITLE:

**CITY OF WHEATON**

**WATERSHED BOUNDARY MAP**



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DSGN.		SCALE:	1:0
DWN.		AUTHOR:	
CHKD.		PLOT DATE:	11/18/2014
FILE:	Aerial_Watershed EXHIBIT 3		

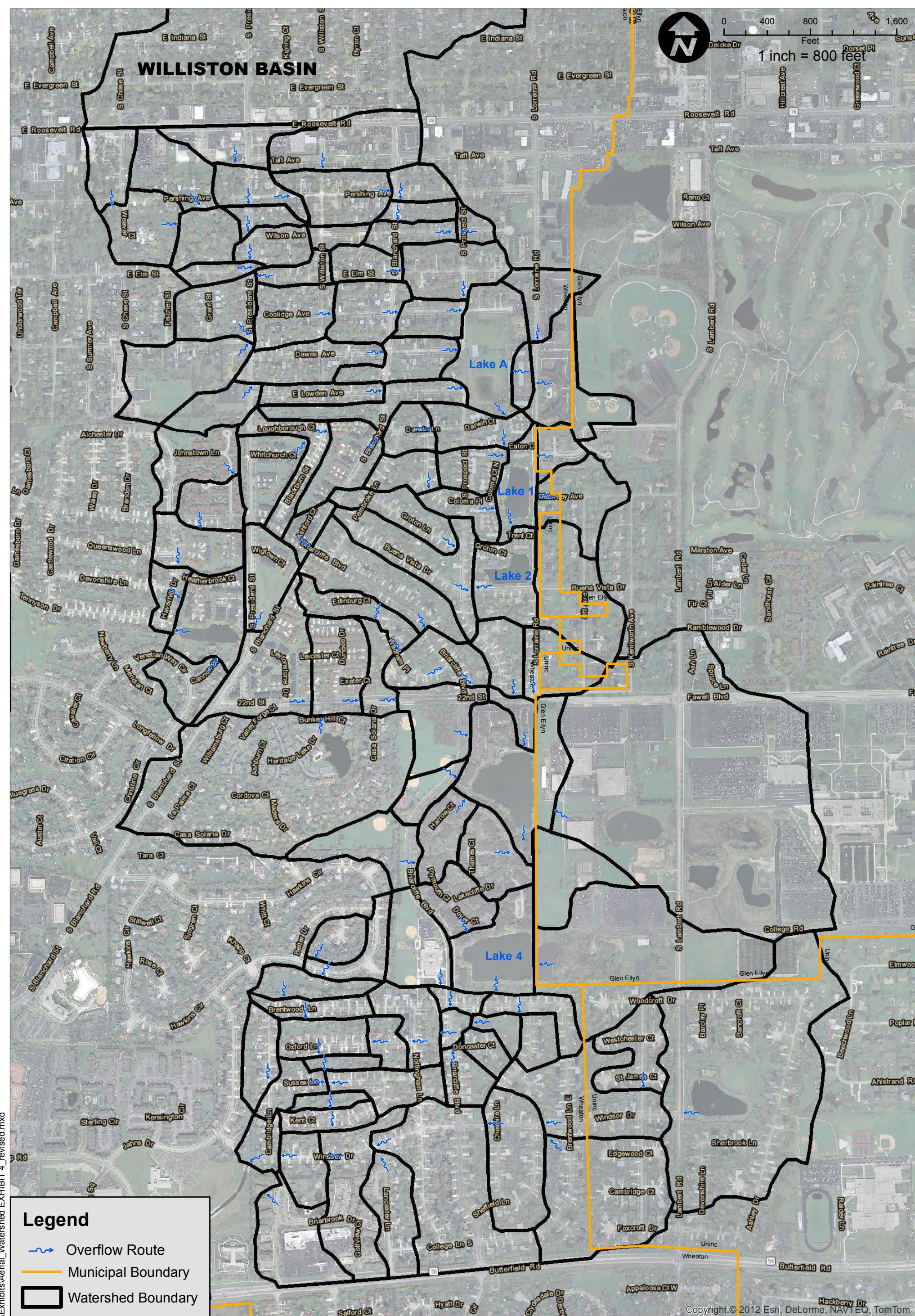
PROJ. NO. 130480

DATE: 11/05/2014

SHEET 1 OF 1

DRAWING NO.

**EXH 3**



CLIENT:

TITLE:

**CITY OF WHEATON**

**OVERFLOW ROUTES**



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DSGN.		SCALE:	1:0
DWN.		AUTHOR:	
CHKD.		PLOT DATE:	1/22/2015
FILE:	Aerial_Watershed EXHIBIT 4_revised		

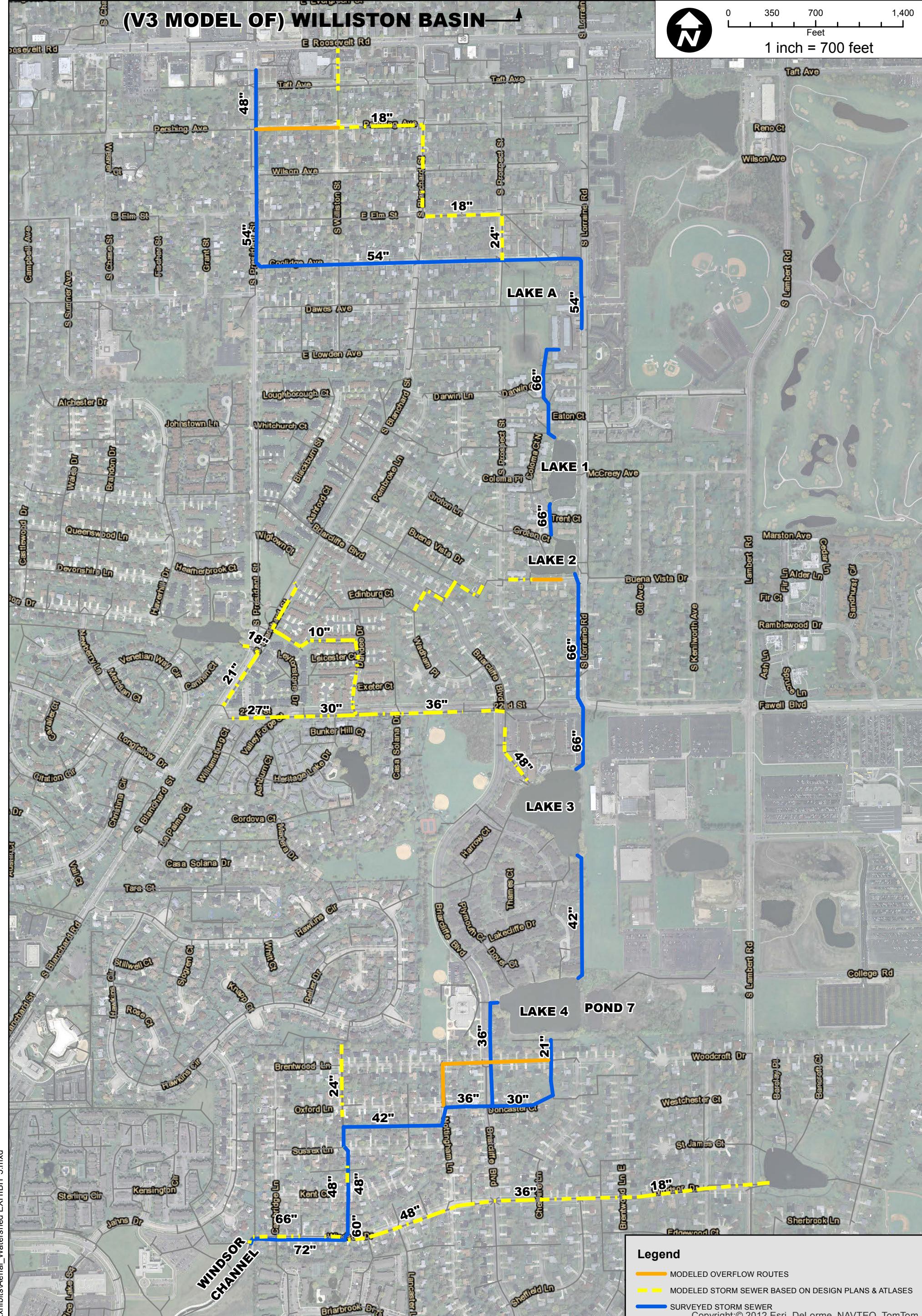
PROJ. NO. 130480  
DATE: 11/05/2014  
SHEET 1 OF 1  
DRAWING NO.

**EXH 4**

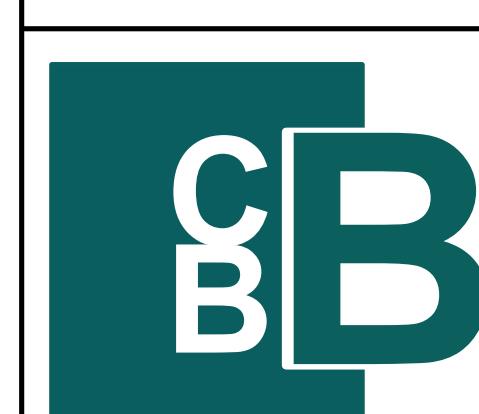
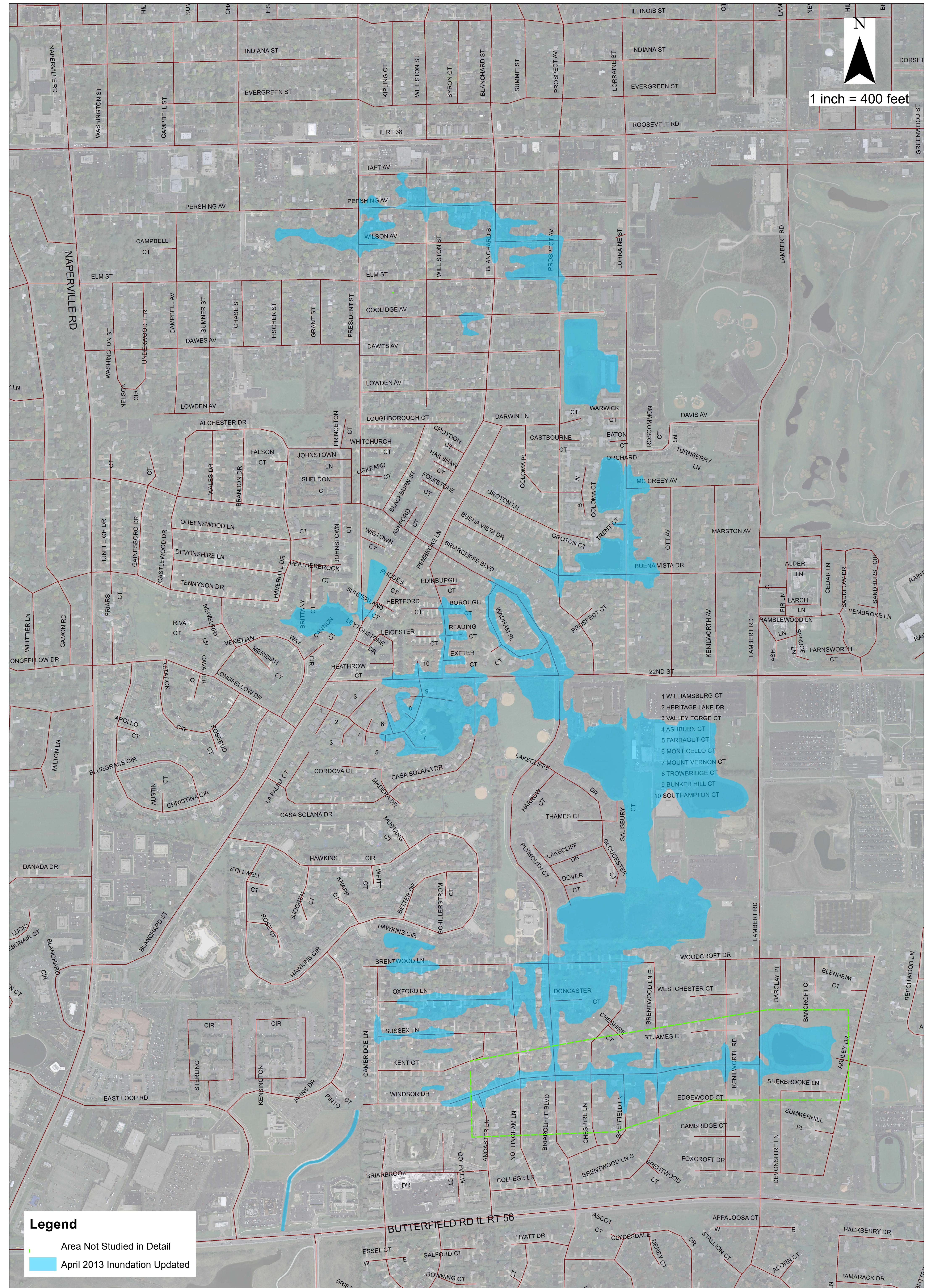
# (V3 MODEL OF) WILLISTON BASIN



0 350 700 1,400  
1 inch = 700 feet



DSGN.		SCALE:	1:0
DWN.		AUTHOR:	
CHKD.		PLOT DATE:	1/23/2015
FILE:	Aerial_Watershed EXHIBIT 5		



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Rosemont, IL 60018  
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CLIENT

CITY OF WHEATON

TITLE

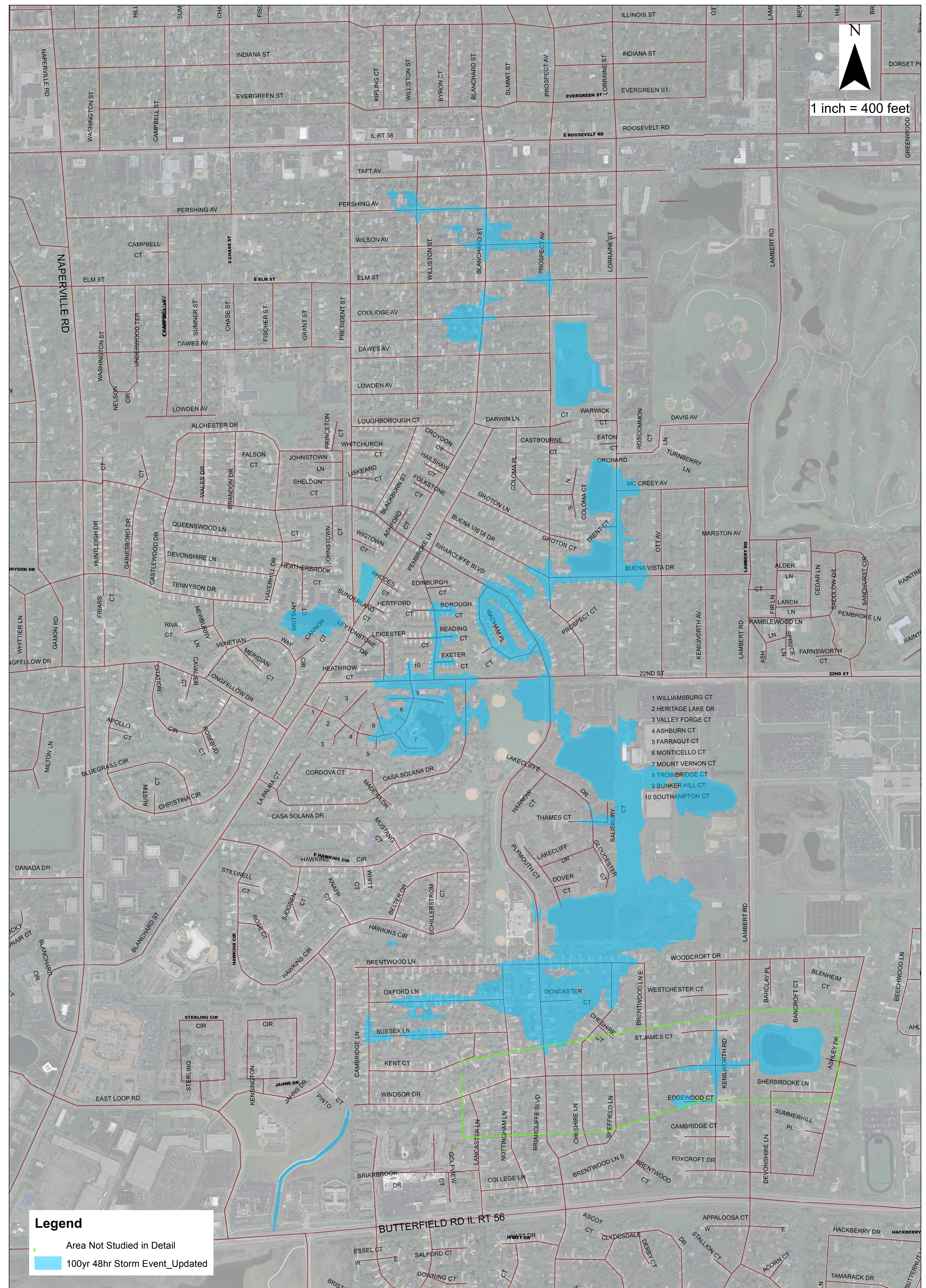
APRIL 2013 STORM EVENT INUNDATION MAPPING

JOB#  
13-0480

DSGN.  
JMG  
CHKD.  
ELG

DATE  
01-23-15

EXHIBIT 6



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CLIENT

CITY OF WHEATON

TITLE

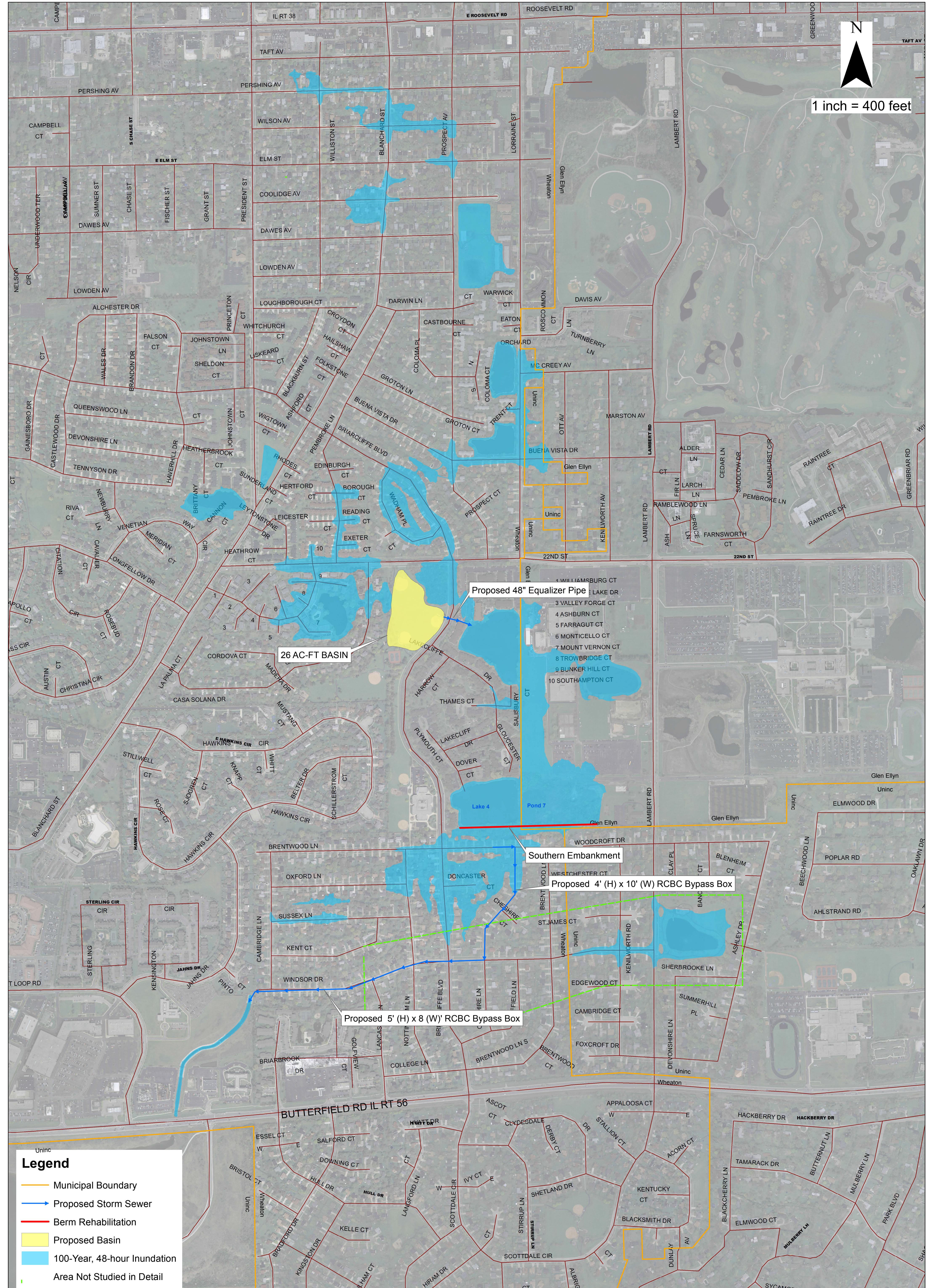
100-YEAR, 48-HOUR INUNDATION MAPPING

JOB#  
13-0480

DSGN.  
JMG  
CHKD.  
ELG

DATE  
01-23-15

EXHIBIT 7



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CLIENT

CITY OF WHEATON

TITLE

PROPOSED ALTERNATIVE 5

JOB#  
13-0480

DSGN.  
JMG  
CHKD.  
ELG

DATE  
01-26-15

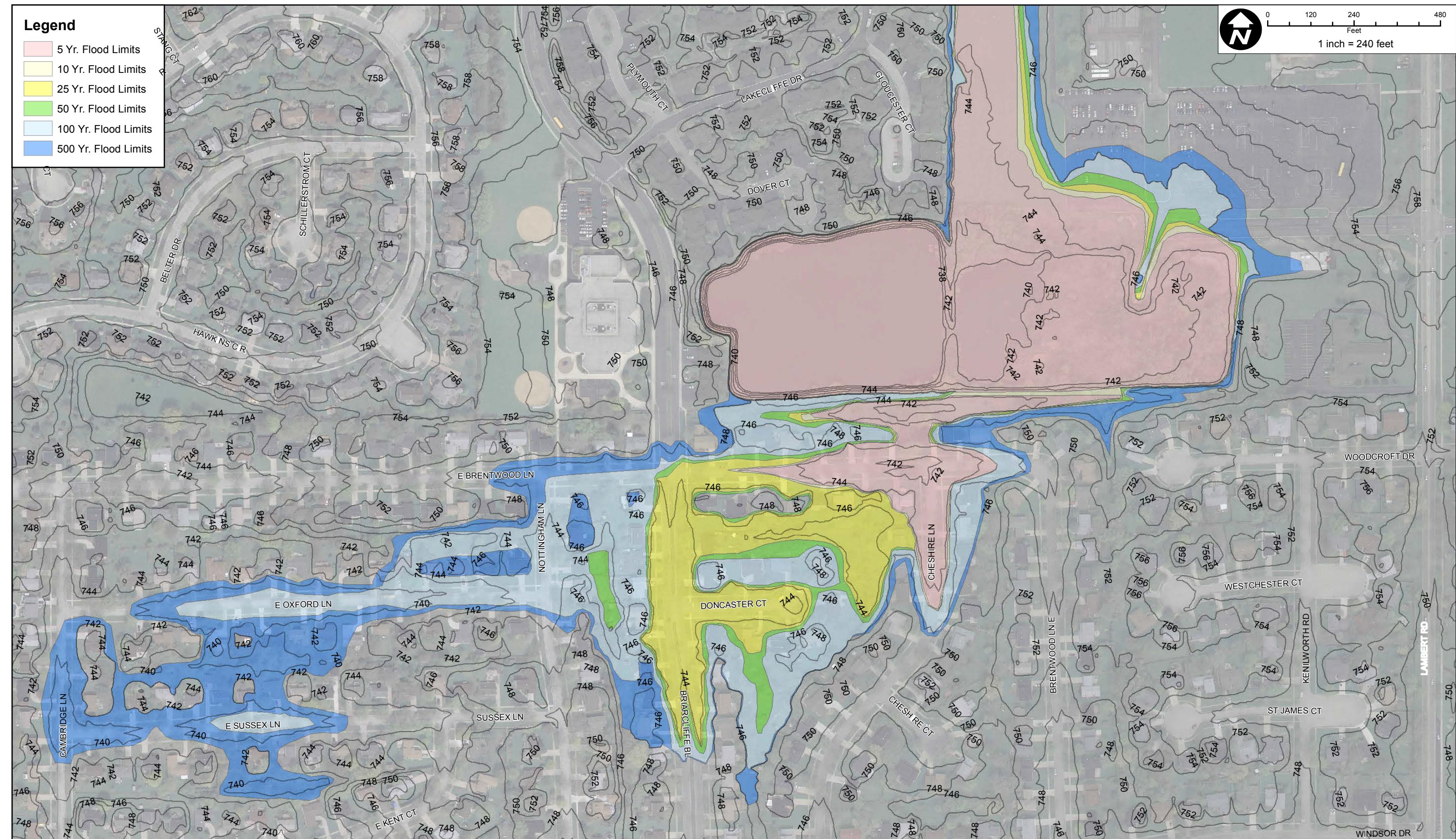
EXHIBIT 8

**Legend**

- 5 Yr. Flood Limits
- 10 Yr. Flood Limits
- 25 Yr. Flood Limits
- 50 Yr. Flood Limits
- 100 Yr. Flood Limits
- 500 Yr. Flood Limits



1 inch = 240 feet

0 120 240 480  
Feet

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CLIENT:

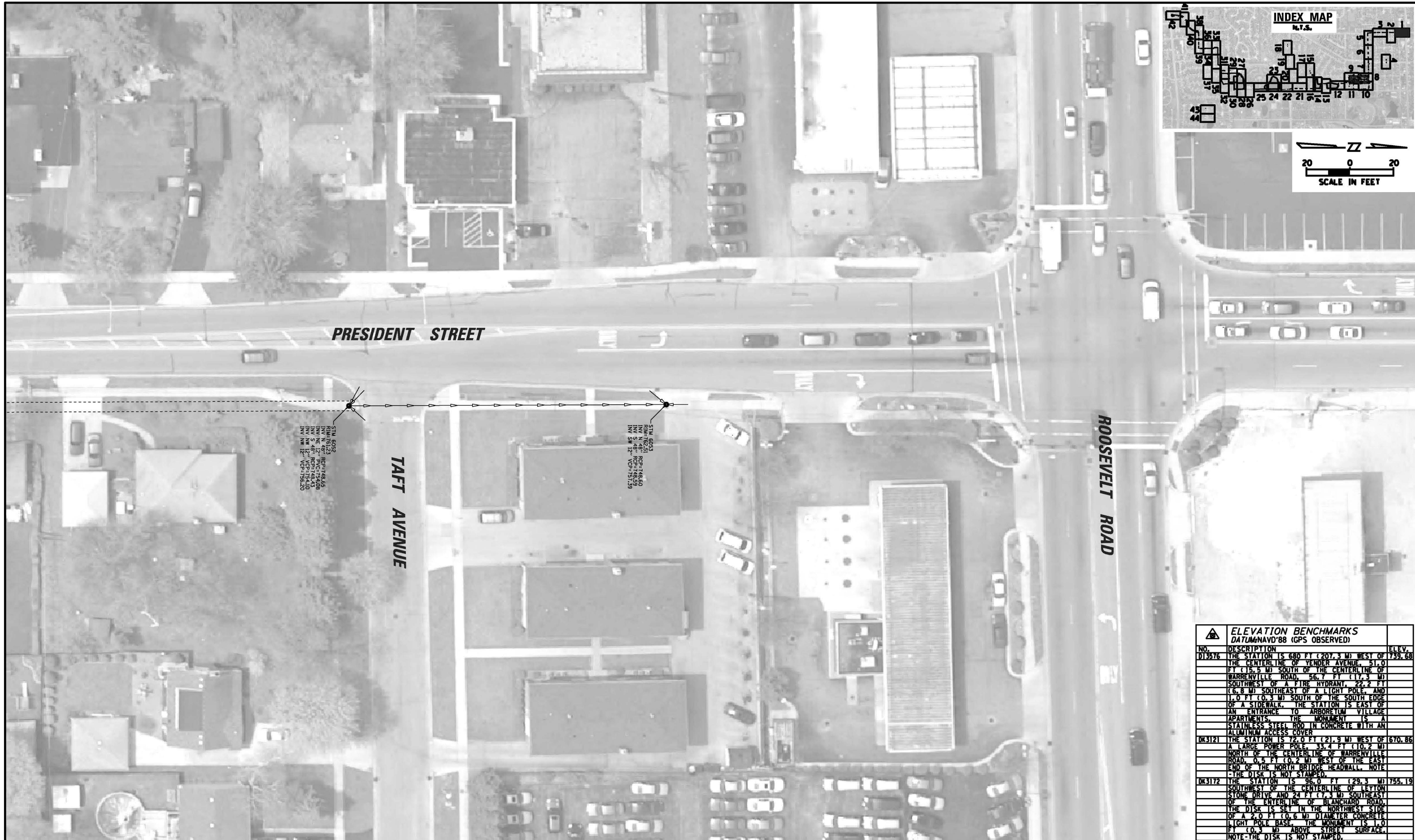
**CITY OF WHEATON**

NO.	DATE	NATURE OF REVISION	DSGN.	CHKD.	SCALE:	PROJ. NO.
			MHAYES		1:0	130480
						DATE: 02/17/2015
						SHEET 0 OF 0
						DRAWING NO.
						EXHIBIT 9

**48 HOUR INUNDATION MAPPING  
FOR MULTIPLE FLOOD FREQUENCIES**

***Appendix 1***  
***Existing Conditions Field Survey***









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303 WEST WESLEY STREET  
WHEATON, IL 60187

			DSGN.	JMG	
			DWN.	EAT	
			CHKD.		
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NO.	DATE	NATURE OF REVISION	CHKD.	MODEL:	Default
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# EXISTING CONDITIONS SITE SURVEY

PROJ. NO. 130480  
DATE: 3/18/2015  
SHEET 5 OF 44  
DRAWING NO.  
EXHIBIT A







# WILLISTON STREET

## COOLIDGE AV

STM 6059  
RIM=761.65  
INV N 15" RCP=754.83  
INV E 54" RCP=746.90  
INV S 24" RCP=748.32  
INV W 54" RCP=746.93

54"

---

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**CITY OF WHEATON**  
303 WEST WESLEY STREET  
WHEATON, IL 60187

			DSGN.	JMG	
			DWN.	EAT	
			CHKD.		
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# EXISTING CONDITIONS SITE SURVEY

This index map displays numbered locations 1 through 39, each marked with a small square. A legend at the bottom right identifies four symbols: a square with a dot (1), a square with a cross (2), a square with a circle (3), and a square with a diagonal line (4).

PROJ. NO. 130480  
DATE: 3/18/2015  
SHEET 6 OF 44  
DRAWING NO.  
  
**EXHIBIT A**



# WILLISTON STREET

## COOLIDGE AV

STM 6059  
RIM=761.65  
INV N 15" RCP=754.83  
INV E 54" RCP=746.90  
INV S 24" RCP=748.32  
INV W 54" RCP=746.93

54"



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303 WEST WESLEY STREET  
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			DSGN.	JMG	
			DWN.	EAT	
			CHKD.		
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# EXISTING CONDITIONS SITE SURVEY

An index map titled "INDEX MAP" and "N.T.S." at the top. The map features a grid of numbered locations. Locations 1 through 10 are in the top row, 11 through 20 in the second, 21 through 30 in the third, 31 through 40 in the fourth, and 41 through 49 in the bottom right corner. Locations 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, and 49 are represented by small rectangles. Locations 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, and 49 are partially or fully obscured by a large black rectangle. Location 1 is at the top left, 10 is at the top right, 40 is at the bottom left, and 49 is at the bottom right. A small legend in the bottom right corner shows a rectangle with the number 45 and a rectangle with the number 46.

**PROJ. NO. 130480**  
**DATE: 3/18/2015**  
**SHEET 7 OF 44**  
**DRAWING NO.**  
**EXHIBIT A**



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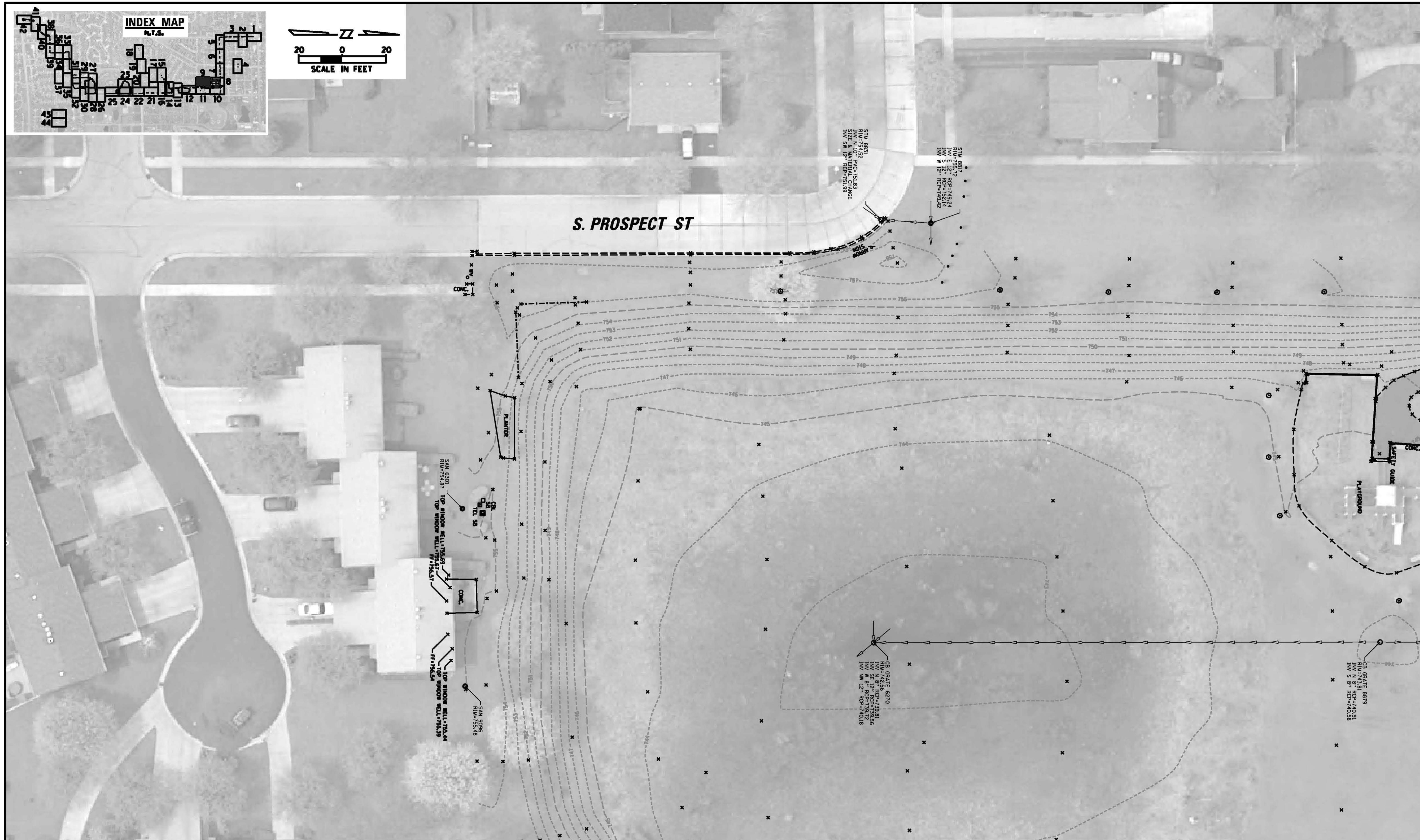


**CITY OF WHEATON**  
303 WEST WESLEY STREET  
WHEATON, IL 60187

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# EXISTING CONDITIONS SITE SURVEY

PROJ. NO. 130480  
DATE: 3/18/2015  
SHEET 8 OF 44  
DRAWING NO.  
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**303 WEST WESLEY STREET**  
**WHEATON, IL 60187**

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		CHKD.	
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NO.	DATE	NATURE OF REVISION	CHKD.
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# EXISTING CONDITIONS SITE SURVEY

PROJ. NO. 130480  
DATE: 3/18/2015  
SHEET 9 OF 44  
DRAWING NO.  
EXHIBIT A





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**CITY OF WHEATON**  
303 WEST WESLEY STREET  
WHEATON, IL 60187

NO.	DATE	NATURE OF REVISION	CHKD.	MODEL:	Default
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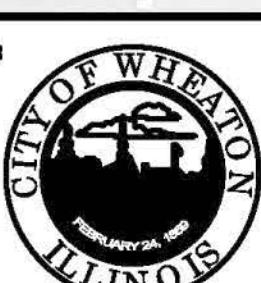
# EXISTING CONDITIONS SITE SURVEY

PROJ. NO. 130480  
DATE: 3/18/2015  
SHEET 11 OF 44  
DRAWING NO.  
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**CITY OF WHEATON**  
303 WEST WESLEY STREET  
WHEATON, IL 60187

			DSGN.	JMG
			DWN.	EAT
			CHKD.	
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			CAD USER:	elmotoda
NO.	DATE	NATURE OF REVISION	CHKD.	MODEL:
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FILE NAME	N:\WHEATON\130480\Water\Plan Set\13-130480.dgn			

# EXISTING CONDITIONS SITE SURVEY

This index map displays numbered locations from 1 to 39, with a legend for '1970s' and '1980s'.

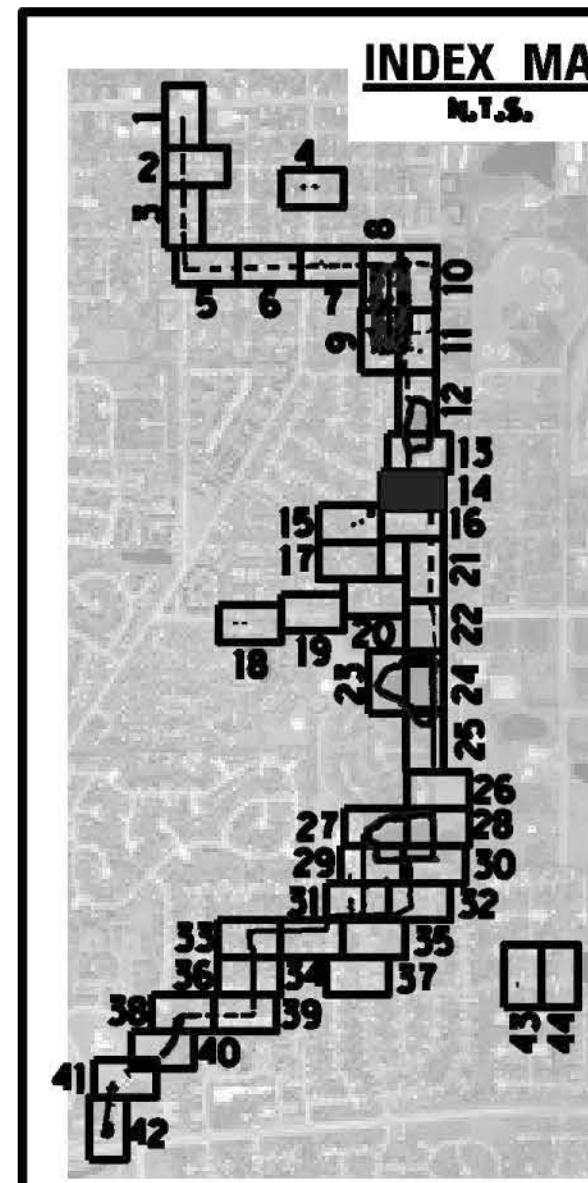
**Legend:**

- 1970s (represented by a square)
- 1980s (represented by a rectangle)

**Numbered Locations:**

- 1 (1970s)
- 2 (1970s)
- 3 (1970s)
- 4 (1970s)
- 5 (1970s)
- 6 (1970s)
- 7 (1970s)
- 8 (1970s)
- 9 (1970s)
- 10 (1970s)
- 11 (1970s)
- 12 (1970s)
- 13 (1980s)
- 14 (1980s)
- 15 (1970s)
- 16 (1970s)
- 17 (1970s)
- 18 (1970s)
- 19 (1970s)
- 20 (1970s)
- 21 (1970s)
- 22 (1970s)
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- 28 (1980s)
- 29 (1970s)
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- 31 (1970s)
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- 34 (1970s)
- 35 (1970s)
- 36 (1970s)
- 37 (1970s)
- 38 (1970s)
- 39 (1970s)

PROJ. NO. 130480  
DATE: 3/18/2015  
SHEET 15 OF 44  
DRAWING NO.  
EXHIBIT A



LORRAINE ROAD



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**CITY OF WHEATON**  
303 WEST WESLEY STREET  
WHEATON, IL 60187

		DSGN.	JMG		
		DWN.	EAT		
		CHKD.			
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		PLOT DATE:	3/18/2015		
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NO.	DATE	NATURE OF REVISION	CHKD.	MODEL:	Default
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# EXISTING CONDITIONS SITE SURVEY

PROJ. NO. 130480  
DATE: 3/18/2015  
SHEET 15 OF 44  
DRAWING NO.  
EXHIBIT A



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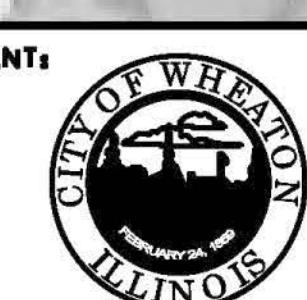


**CITY OF WHEATON**  
303 WEST WESLEY STREET  
WHEATON, IL 60187

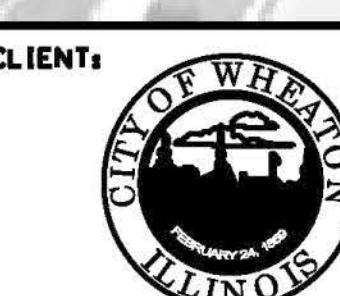
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			CHKD.		
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NO.	DATE	NATURE OF REVISION	CHKD.	MODEL:	Default
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# EXISTING CONDITIONS SITE SURVEY

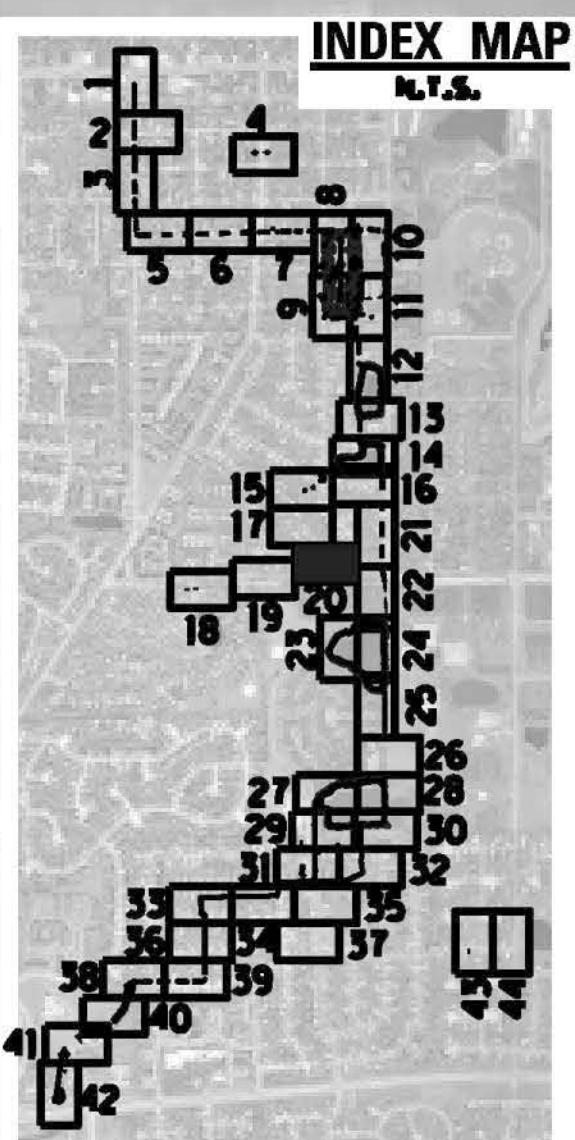
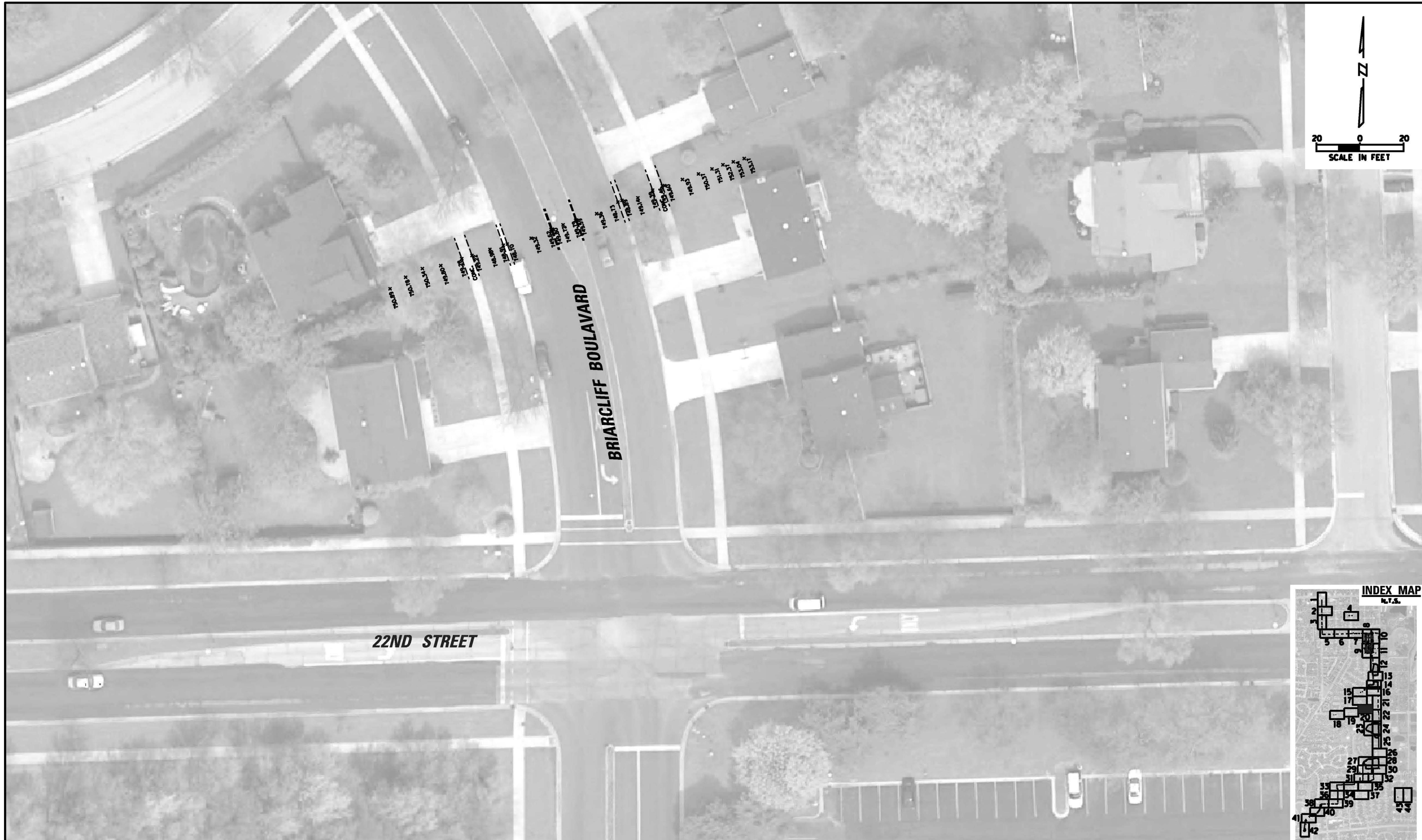
PROJ. NO. 130480  
DATE: 3/18/2015  
SHEET 16 OF 44  
DRAWING NO.  
EXHIBIT A



			DSGN.	JMG	
			DRAW.	EAT	
			CHKD.		
			SCALE:	20'	
			PLOT DATE:	3/18/2015	
			CAD USER:	elmotoda	
			MODEL:	Default	
NO.	DATE	NATURE OF REVISION	CHKD.		
FILE NAME					







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Rosemont, Illinois 60018  
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The seal of the City of Wheaton, Illinois. It is a circular emblem. The outer ring contains the words "CITY OF WHEATON" at the top and "ILLINOIS" at the bottom. The inner circle features a landscape illustration with a bridge and a building, with the date "FEBRUARY 24, 1859" inscribed at the bottom.

**CITY OF WHEATON**  
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WHEATON, IL 60187

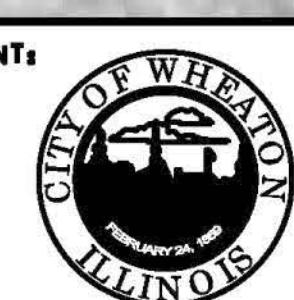
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		CHKD.			
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NO.	DATE	NATURE OF REVISION	CHKD.	MODEL:	Default
FILE NAME		N:\WHEATON\130480\Water\Plan Set\20-130480.dgn			

# EXISTING CONDITIONS SITE SURVEY

PROJ. NO. 130480  
DATE: 3/18/2015  
SHEET 20 OF 44  
DRAWING NO.  
EXHIBIT A



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NO.	DATE	NATURE OF REVISION	DSGN.	JMG
FILE NAME			DWNR.	EAT
			CHKD.	
			SCALE:	20'
			PLOT DATE:	3/18/2015
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			MODEL:	Default

**EXISTING CONDITIONS SITE SURVEY**

PROJ. NO. 130480  
DATE: 3/18/2015  
SHEET 21 OF 44  
DRAWING NO.  
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WHEATON, IL 60187

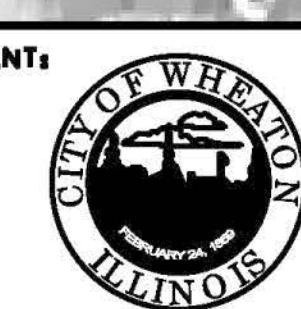
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# **EXISTING CONDITIONS SITE SURVEY**

PROJ. NO. 130480  
DATE: 3/18/2015  
SHEET 25 OF 44  
DRAWING NO.  
EXHIBIT A



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**CITY OF WHEATON**  
303 WEST WESLEY STREET  
WHEATON, IL 60187

NO.	DATE	NATURE OF REVISION	DSGN.	JMG
			DWLN.	EAT
			CHKD.	
			SCALE:	20'
			PLOT DATE:	3/18/2015
			CAD USER:	elmotoda
			MODEL:	Default

FILE NAME: M:\WHEATON\130480\Water\Plan Set\24-130480.dgn

**EXISTING CONDITIONS SITE SURVEY**

PRO. NO. 130480  
DATE: 3/18/2015  
SHEET 24 OF 44  
DRAWING NO.  
EXHIBIT A





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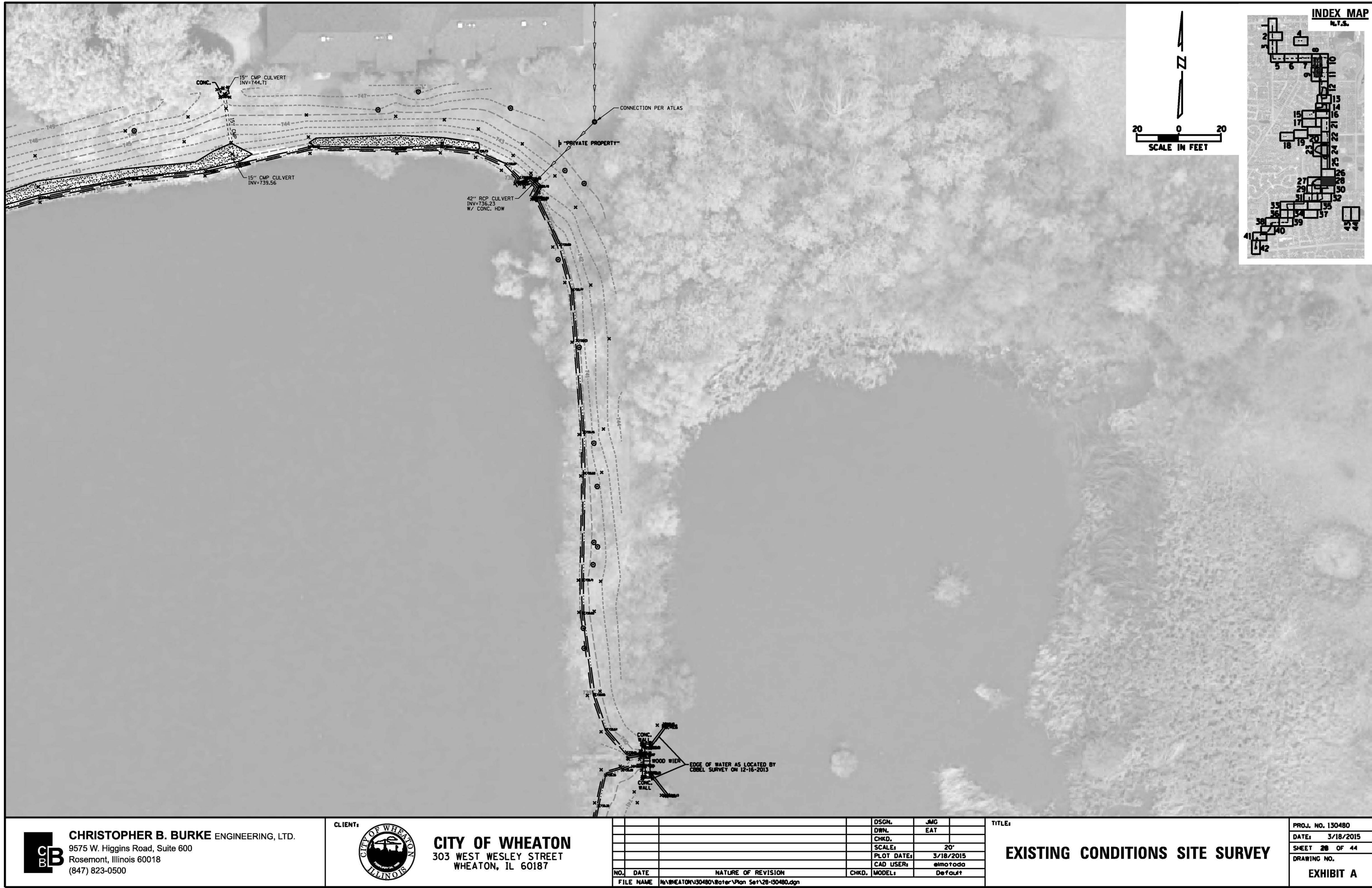
**CITY OF WHEATON**  
303 WEST WESLEY STREET  
WHEATON, IL 60187

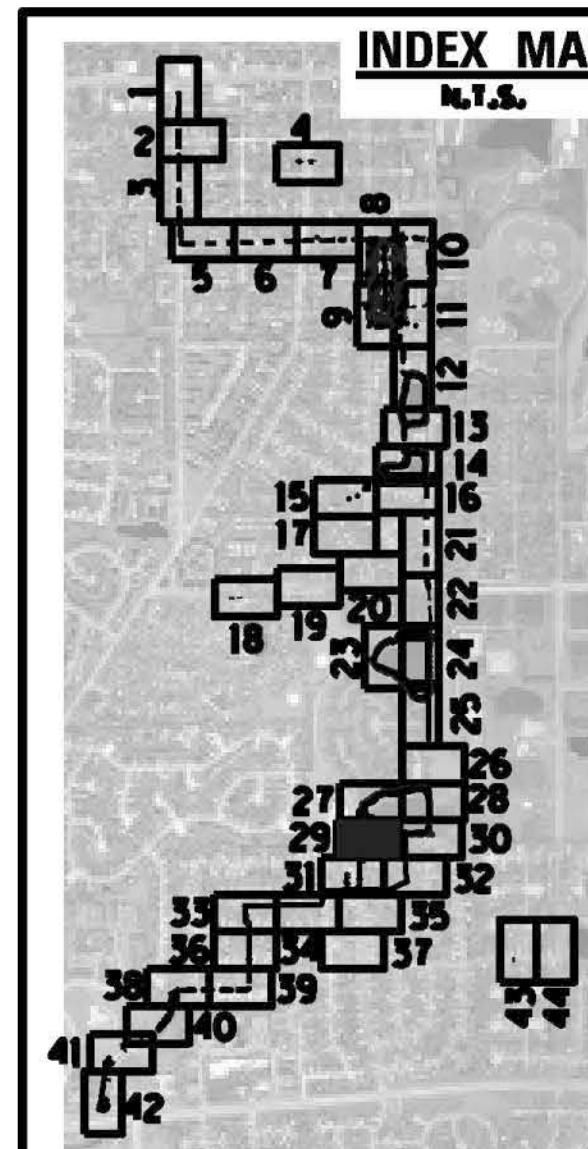
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			CHKD.	
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			MODEL:	Default

**EXISTING CONDITIONS SITE SURVEY**

PROJ. NO. 130480  
DATE: 3/18/2015  
SHEET 26 OF 44  
DRAWING NO.  
EXHIBIT A







## INDEX MAP

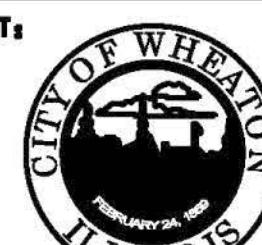
A horizontal scale bar with a central black segment and two white segments on either side. The number '20' is at each end. Below it, the text 'SCALE IN FEET' is written in a bold, sans-serif font.

SCALE IN FEET

STM 5642  
RIM=747.10  
INV N 36" RCP=735.  
INV S 36" RCP=735.

## BRIARCLIFF BOULEVARD

## **BRENTWOOD LAND**

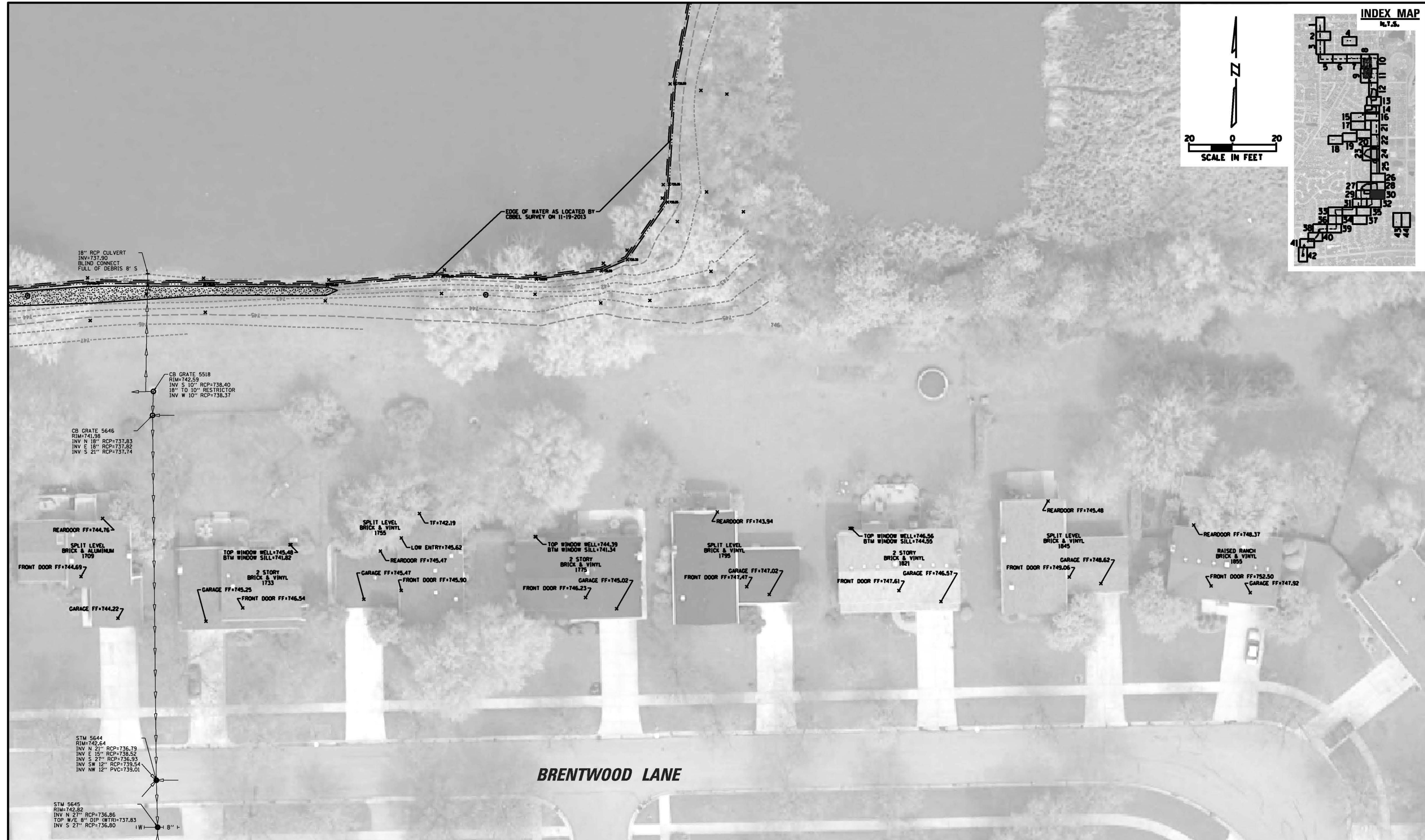


**CITY OF WHEATON**  
303 WEST WESLEY STREET  
WHEATON, IL 60187

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		DWN.	EAT	
		CHKD.		
		SCALE:	20'	
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NO.	DATE	NATURE OF REVISION	CHKD.	MODEL:
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# EXISTING CONDITIONS SITE SURVEY

PROJ. NO. 130480  
DATE: 3/18/2015  
SHEET 29 OF 44  
DRAWING NO.  
  
**EXHIBIT A**



**BRENTWOOD LANE**

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			DSGN.	JMG	
			DWN.	EAT	
			CHKD.		
			SCALE:	20'	
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			CAD USER:	elmotoda	
NO.	DATE	NATURE OF REVISION	CHKD.	MODEL:	Default
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# EXISTING CONDITIONS SITE SURVEY

PROJ. NO. 130480  
DATE: 3/18/2015  
SHEET 30 OF 44  
DRAWING NO.  
  
**EXHIBIT A**

## **NOTTINGHAM LN**

## **INDEX MAP**

N.Y.C.T.A.

CONC. 745.25  
 - - - " 745.29  
 x 745.88  
 x 746.31  
 x 746.78  
 747.31  
 747.39  
 CONC. WALL 747.91  
 747.72  
 x 748.33  
 FF = 748.75  
 FRONT DOOR FF = 749.3  
 PLIT LEVEL  
 TICK & VINYL  
 1636  
 REAR DOOR FF = 745.5  
 0 20  
 SCALE IN FEET

A scale bar with markings at 0 and 20, and a central tick mark. Below it is the text "SCALE IN FEET".

## **DONCASTER CT**

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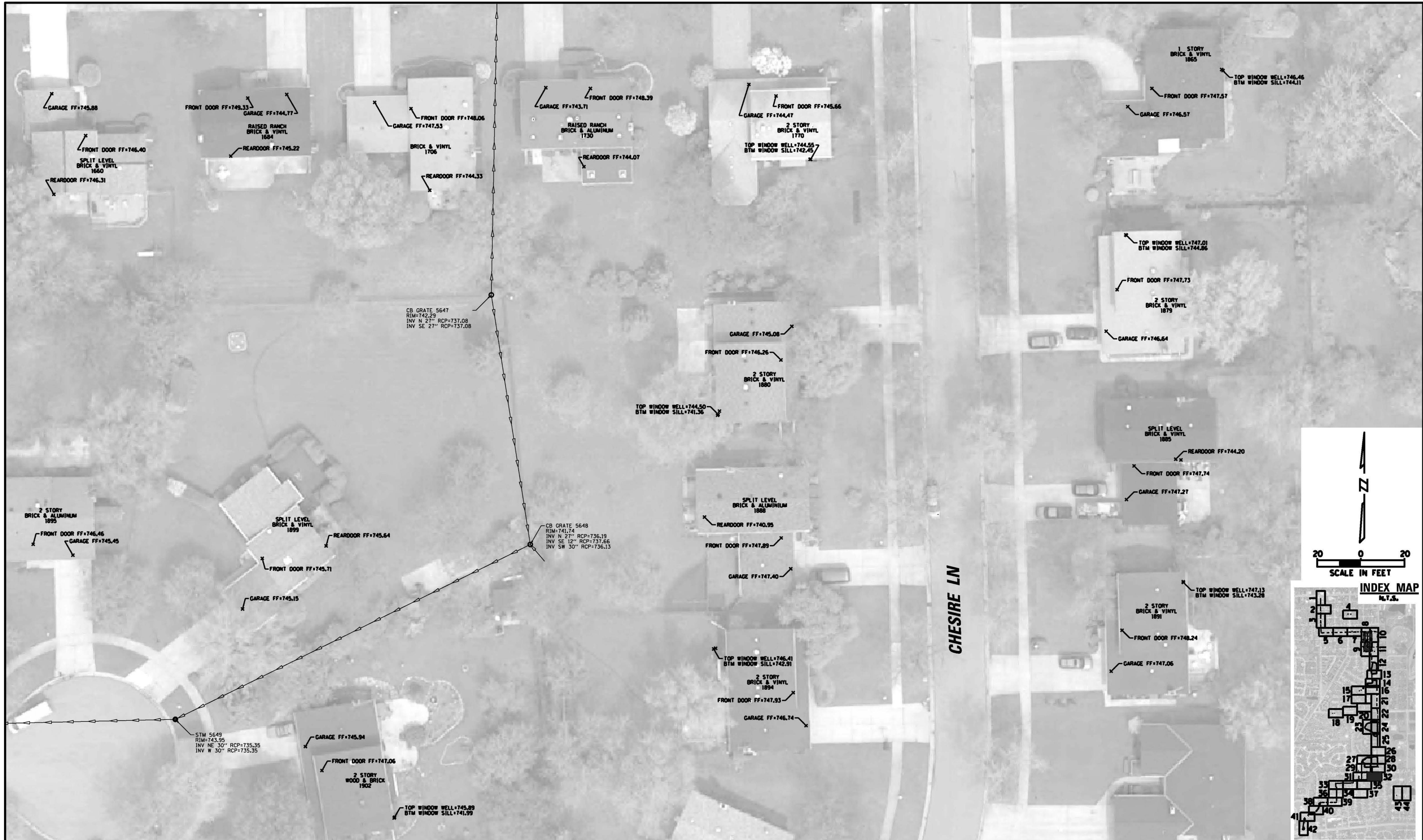


**CITY OF WHEATON**  
303 WEST WESLEY STREET  
WHEATON, IL 60187

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		DWN.	EAT	
		CHKD.		
		SCALE:	20'	
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		CAD USER:	elmotoda	
NO.	DATE	NATURE OF REVISION	CHKD.	MODEL:
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# EXISTING CONDITIONS SITE SURVEY

PROJ. NO. 130480  
DATE: 3/18/2015  
SHEET 31 OF 44  
DRAWING NO.  
EXHIBIT A



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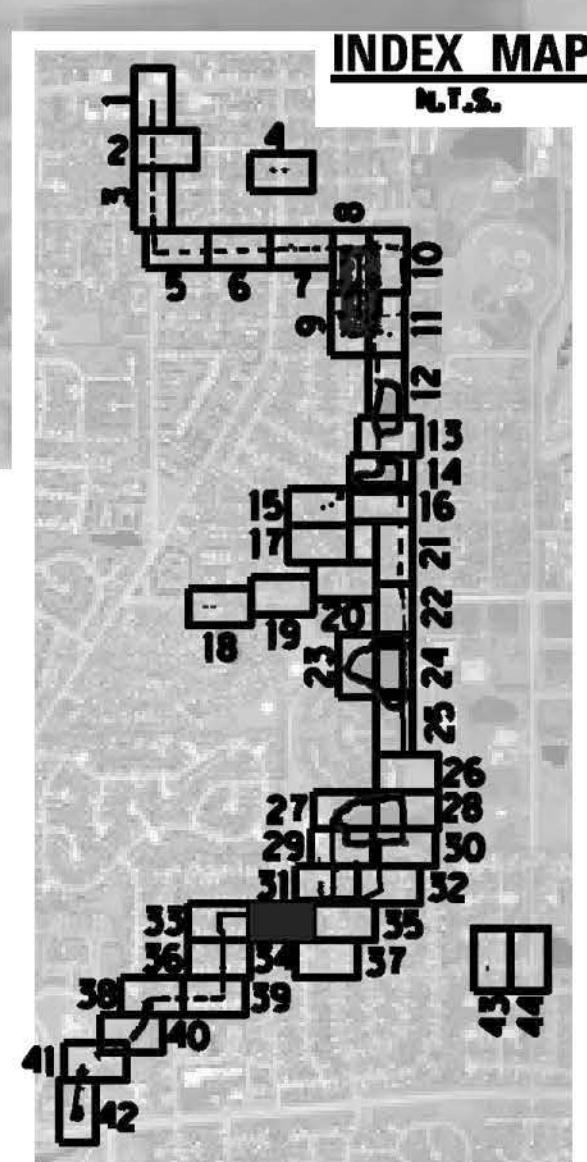
**CITY OF WHEATON**  
303 WEST WESLEY STREET  
WHEATON, IL 60187

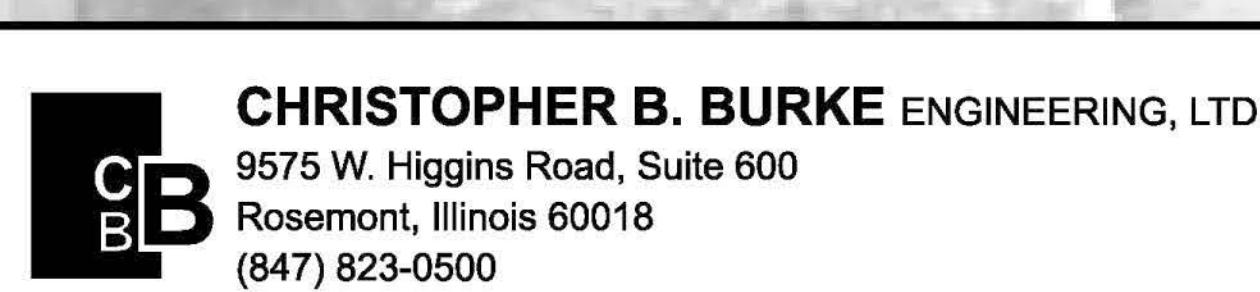
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		CHKD.		
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NO.	DATE	NATURE OF REVISION	CHKD.	MODEL:
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# EXISTING CONDITIONS SITE SURVEY

PROJ. NO. 130480  
DATE: 3/18/2015  
SHEET 32 OF 44  
DRAWING NO.  
EXHIBIT A







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303 WEST WESLEY STREET  
WHEATON, IL 60187

		DSGN.	JMG
		DWN.	EAT
		CHKD.	
		SCALE:	20'
		PLOT DATE:	3/18/2015
		CAD USER:	elmotoda
NO.	DATE	NATURE OF REVISION	CHKD.
FILE NAME	N:\WHEATON\30480\Water\Plan Set\35-30480.dgn		

# EXISTING CONDITIONS SITE SURVEY

PROJ. NO. 130480  
DATE: 3/18/2015  
SHEET 35 OF 44  
DRAWING NO.  
EXHIBIT A





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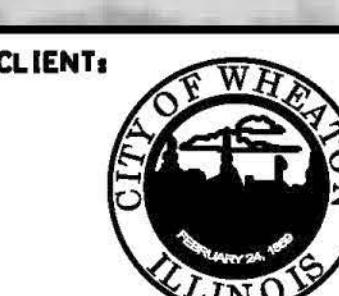
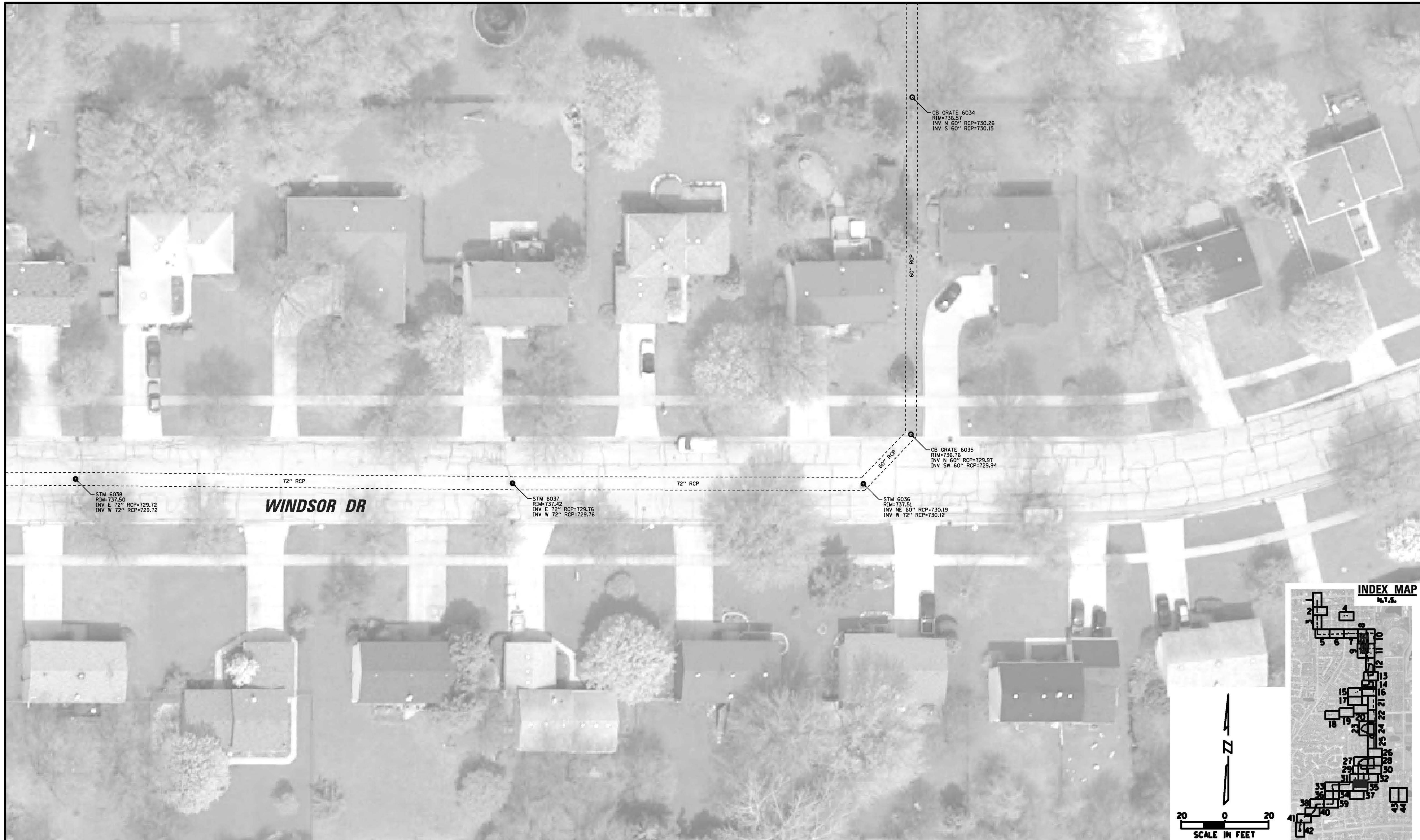
**CITY OF WHEATON**  
303 WEST WESLEY STREET  
WHEATON, IL 60187

NO.	DATE	NATURE OF REVISION	DSGN.	JMG
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			CHKD.	
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			MODEL:	Default

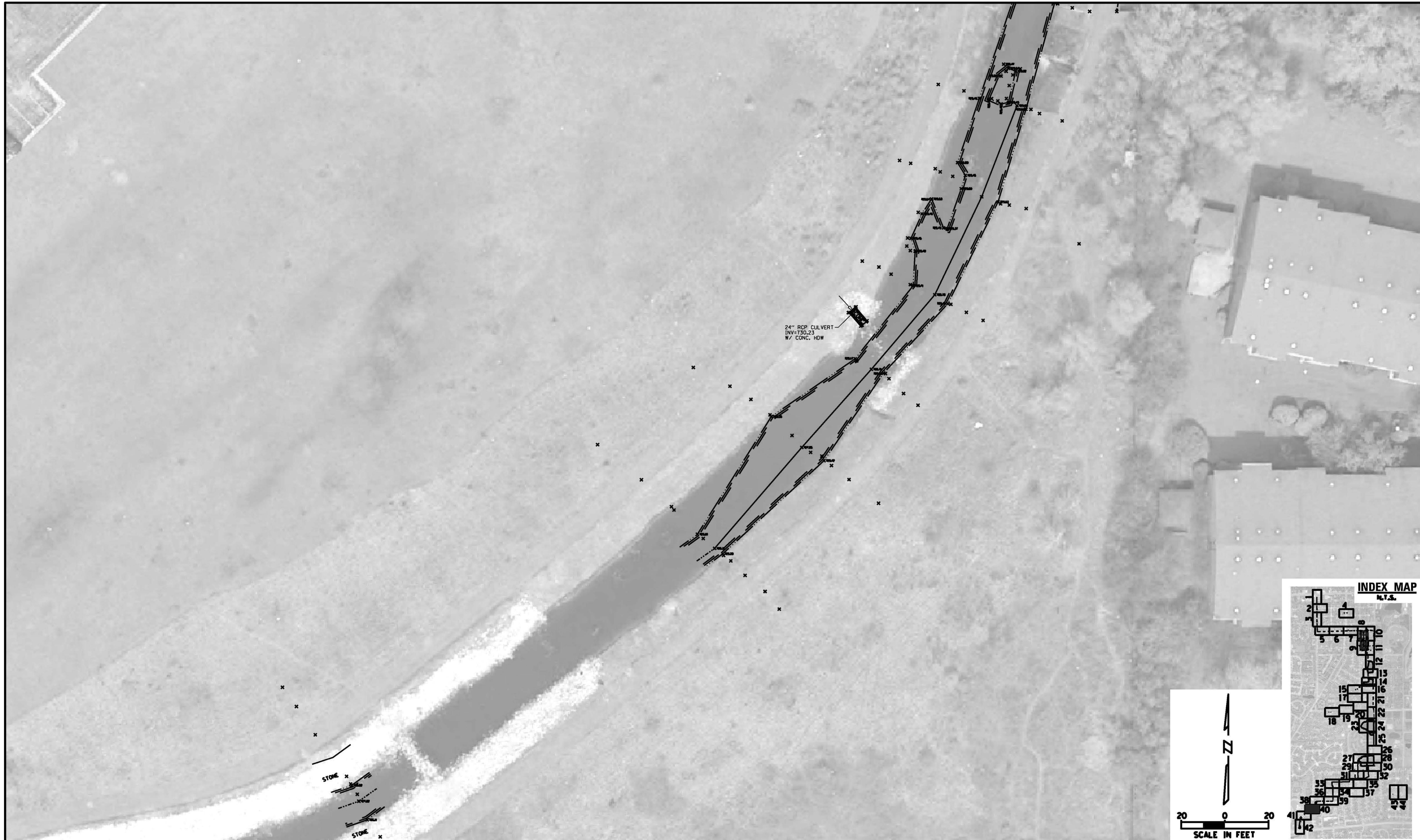
**EXISTING CONDITIONS SITE SURVEY**

PROJ. NO. 130480  
DATE: 3/18/2015  
SHEET 37 OF 44  
DRAWING NO.  
EXHIBIT A

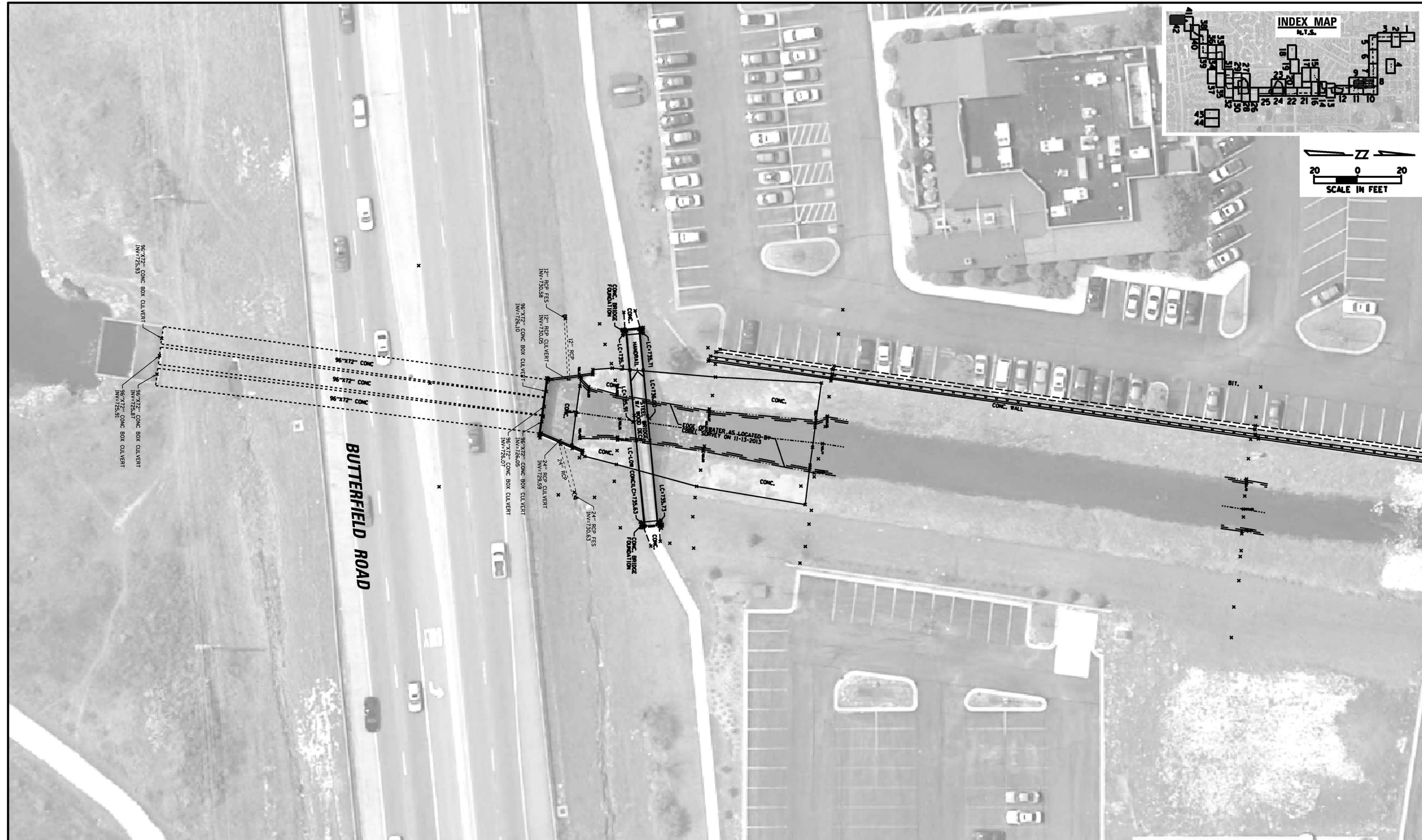




NO.	DATE	NATURE OF REVISION	DSGN.	JMG
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			CHKD.	
			SCALE:	20'
			PLOT DATE:	3/18/2015
			CAD USER:	elmotoda
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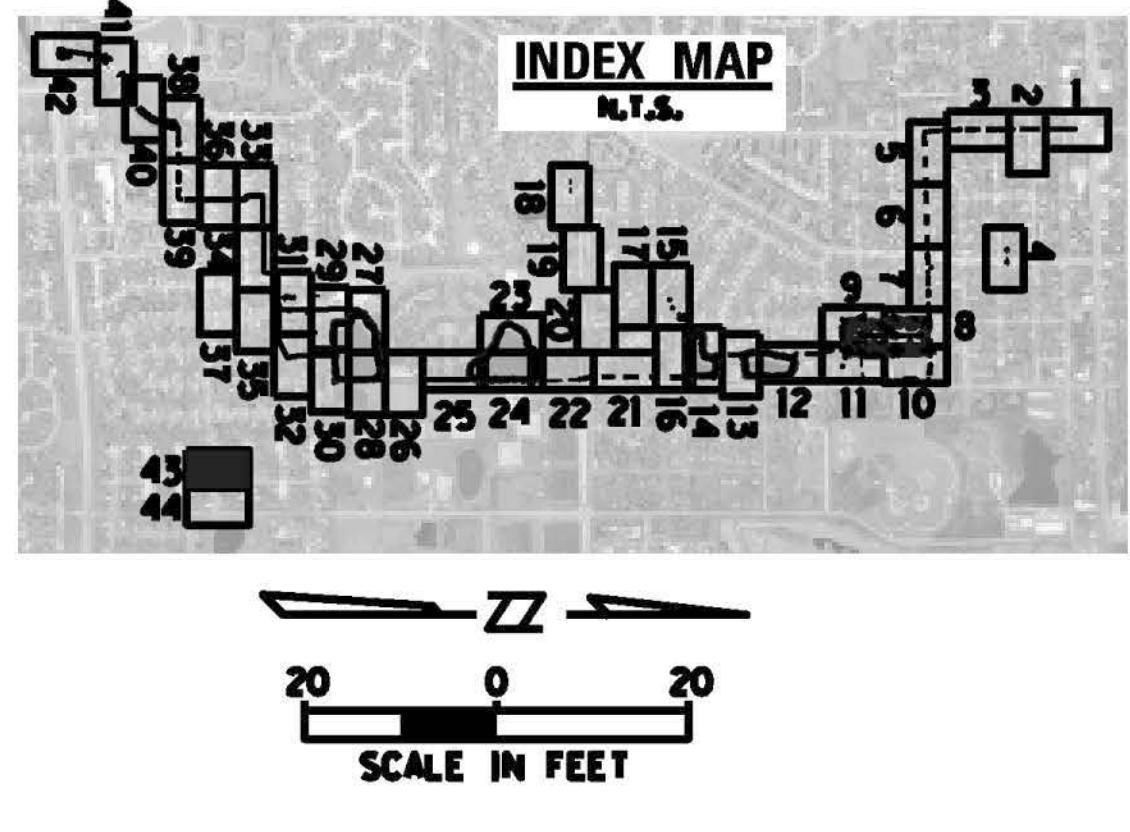


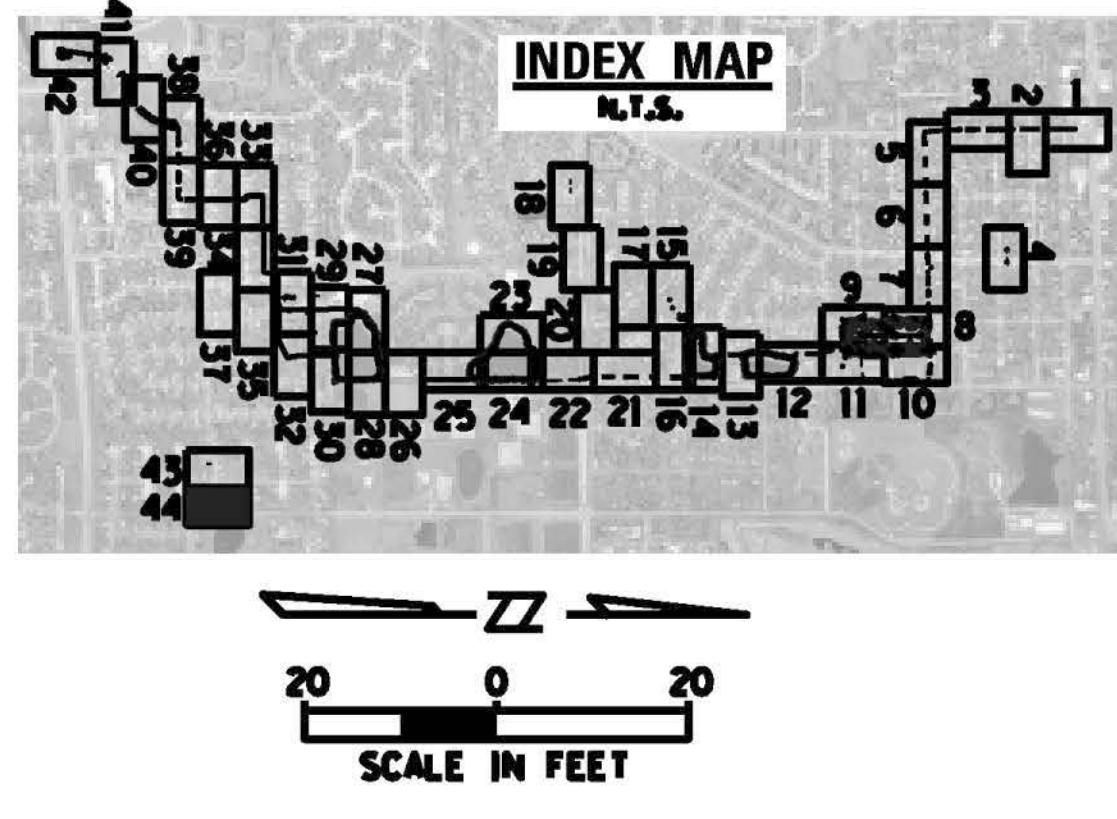
**CITY OF WHEATON**  
303 WEST WESLEY STREET  
WHEATON, IL 60187

NO.	DATE	NATURE OF REVISION	DSGN.	JMC	TITLE
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			CHKD.		
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			CAD USER:	elmotoda	
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# EXISTING CONDITIONS SITE SURVEY

PROJ. NO. 130480  
DATE: 3/18/2015  
SHEET 42 OF 44  
DRAWING NO.  
EXHIBIT A





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		DSGN.	JMG
		DWN.	EAT
		CHKD.	
		SCALE:	20'
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		CAD USER:	emotoda
NO.	DATE	NATURE OF REVISION	CHKD.
FILE NAME	N:\WHEATON\130480\Water\Plan Set\44-130480.dgn		

# **EXISTING CONDITIONS SITE SURVEY**

PROJ. NO. 130480  
DATE: 3/18/2015  
SHEET 44 OF 44  
DRAWING NO.  
EXHIBIT A

**Appendix 2**  
***Low Entry Elevation Data Summary***



<b>Address</b>	<b>Low Entry Location</b>	<b>Low Entry Elevation (NAVD88)</b>
1585 BRENTWOOD LANE	Well Top	747.52
1590 BRENTWOOD LANE	Rear Door	745.12
1616 BRENTWOOD LANE	F. F. Garage	747.26
1619 BRENTWOOD LANE	F. F. Garage	745.55
1636 BRENTWOOD LANE	F. F. Garage	745.57
1639 BRENTWOOD LANE	Well Top	746.36
1660 BRENTWOOD LANE	F. F. Garage	745.88
1663 BRENTWOOD LANE	Well Top	746.01
1684 BRENTWOOD LANE	F. F. Garage	744.77
1687 BRENTWOOD LANE	F. F. Garage	745.13
1706 BRENTWOOD LANE	F. F. Rear Door	744.33
1709 BRENTWOOD LANE	F. F. Garage	744.22
1730 BRENTWOOD LANE	F. F. Garage	743.71
1733 BRENTWOOD LANE	F. F. Garage	745.25
1755 BRENTWOOD LANE	Top of Found.	742.19
1770 BRENTWOOD LANE	F. F. Garage	744.47
1775 BRENTWOOD LANE	Well Top	744.39
1795 BRENTWOOD LANE	F. F. Rear Door	743.94
1821 BRENTWOOD LANE	Well Top	746.56
1845 BRENTWOOD LANE	F. F. Rear Door	745.48
1855 BRENTWOOD LANE	F. F. Garage	747.92
1865 CHESHIRE LANE	Well Top	746.46
1865 NOTTINGHAM LANE	Well Top	745.71
1872 BRIARCLIFFE BLVD	F. F. Garage	744.63
1876 BRIARCLIFFE BLVD	F. F. Garage	745.10
1879 CHESHIRE LANE	F. F. Garage	746.57
1879 BRIARCLIFFE BLVD	Well Top	744.70
1879 NOTTINGHAM LANE	F. F. Garage	744.38
1880 CHESHIRE LANE	Well Top	744.50
1884 BRIARCLIFFE BLVD	Well Top	744.66

<b>Address</b>	<b>Low Entry Location</b>	<b>Low Entry Elevation (NAVD88)</b>
1885 CHESHIRE LANE	F. F. Rear Door	744.20
1885 NOTTINGHAM LANE	Well Top	743.49
1887 BRIARCLIFFE BLVD	F. F. Rear Door	744.73
1888 CHESHIRE LANE	F. F. Rear Door	740.95
1891 NOTTINGHAM LANE	F. F. Rear Door	743.47
1891 CHESHIRE LANE	F. F. Garage	747.06
1891 DONCASTER COURT	Well Top	744.48
1892 BRIARCLIFFE BLVD	F. F. Garage	745.56
1894 CHESHIRE LANE	F. F. Garage	746.41
1895 DONCASTER COURT	Well Top	745.34
1897 NOTTINGHAM LANE	F. F. Garage	745.60
1898 BRIARCLIFFE BLVD	F. F. Rear Door	743.74
1899 DONCASTER COURT	F. F. Garage	745.15
1902 DONCASTER COURT	Well Top	745.89
1903 NOTTINGHAM LANE	F. F. Garage	745.77
1904 BRIARCLIFFE BLVD	F. F. Garage	743.92
1904 DONCASTER COURT	F. F. Garage	746.82
1906 DONCASTER COURT	Well Top	745.82
1908 DONCASTER COURT	Well Top	745.80
1910 BRIARCLIFFE BLVD	F. F. Garage	744.63
1911 BRIARCLIFFE BLVD	Well Top	745.39
1913 BRIARCLIFFE BLVD	F. F. Garage	744.60

***Appendix 3***  
***Cost Estimate***



Wheaton Exhibit 3 Alt-1					
Briar Patch Park					
Element	Units	Quantity	Unit Price	Line Price	Element Price
<b>Storm Sewer System</b>					<b>\$192,000</b>
48" RCP	Ft	350	\$200	\$70,000	
36" RCP	Ft	0	\$120	\$0	
8'x5' Box Culvert	Ft	0	\$1,100	\$0	
Inlets/12" Laterals	Ea	8	\$4,000	\$32,000	
Manholes/Risers	Ea	5	\$12,000	\$60,000	
End Sections	Ea	2	\$15,000	\$30,000	
<b>Utility Resotration</b>					<b>\$32,500</b>
Water Main Relocate	Ft	50	\$375	\$18,750	
Sanitary Sewer Relocate	Ft	50	\$275	\$13,750	
Wat/San Services Adjustments	Ea	0	\$3,000	\$0	
<b>Grounds Restoration</b>					<b>\$3,729,600</b>
Earth Excavation	Cu Yd	70000	\$35	\$2,450,000	
Pvmt Recon over Pr Stm Sew	Sq Yd	100	\$66	\$6,600	
Resurface lane adjacent to Pr Stm Sew	Sq Yd	100	\$26	\$2,600	
Curb/Gutter Restore (one side + at CB's)	Ft	80	\$24	\$1,920	
Sidewalk/ADA restore	Sq Ft	400	\$16	\$6,400	
Landscape Restore	Sq Yd	52400	\$6	\$314,400	
Baseball Field replacement	Ea	3	\$50,000	\$150,000	
Field drainage system	Sq Yd	52400	\$15	\$786,000	
Tree Impacts	Ft	150	\$20	\$3,000	
Driveway Restore	Sq Ft	0	\$35	\$0	
Parking Lot / Entrance Restore	Sq Ft	217	\$40	\$8,680	
<b>Miscellaneous</b>					<b>\$1,794,290</b>
Temp Sed/Eros Control	Sq Yd	52400	\$4	\$209,600	
As-Built Drawings	L Sum	1	\$3,000	\$3,000	
Dewatering	L Sum	4.0%	\$3,954,100	\$158,170	
Maintenance of Traffic	L Sum	2.0%	\$3,954,100	\$79,090	
Construction Layout	L Sum	1.0%	\$3,954,100	\$39,550	
CCDD Testing/Disposal Fees	L Sum	1.0%	\$3,954,100	\$39,550	
Private Utility Adjustments	L Sum	3.0%	\$3,954,100	\$118,630	
Mobilization	L Sum	4.0%	\$3,954,100	\$158,170	
Contingency	L Sum	25.0%	\$3,954,100	\$988,530	
<b>Acquisition / Engineering / Management</b>					<b>\$1,149,690</b>
Land Acquisition - Widen Ex Perm Easement	Sq Ft	0	\$20	\$0	
Land Acquisition - Construction Easement	Sq Ft	0	\$10	\$0	
Design Engineering	L Sum	7.5%	\$5,748,390	\$431,130	
Permitting	L Sum	2.5%	\$5,748,390	\$143,710	
Construction Observation	L Sum	8.0%	\$5,748,390	\$459,880	
Administration Village	L Sum	2.0%	\$5,748,390	\$114,970	
			<b>Grand Total</b>	<b>\$6,898,080</b>	

Wheaton Exhibit 3 Alt-2					
Lake 4 Berm Repair + Pond 7 Wetland Enhancements					
Element	Units	Quantity	Unit Price	Line Price	Element Price
<b>Storm Sewer System</b>					<b>\$0</b>
36" RCP	Ft	0	\$120	\$0	
Inlets/12" Laterals	Ea	0	\$4,000	\$0	
Manholes/Risers	Ea	0	\$12,000	\$0	
End Sections	Ea	0	\$15,000	\$0	
<b>Utility Resotration</b>					<b>\$0</b>
Water Main Relocate	Ft	0	\$375	\$0	
Sanitary Sewer Relocate	Ft	0	\$275	\$0	
Wat/San Services Adjustments	Ea	0	\$3,000	\$0	
<b>Grounds Restoration</b>					<b>\$167,940</b>
Earth Excavation	Cu Yd	2934	\$35	\$102,690	
Pvmt Recon over Pr Stm Sew	Sq Yd	0	\$66	\$0	
Resurface lane adjacent to Pr Stm Sew	Sq Yd	0	\$26	\$0	
Curb/Gutter Restore (one side + at CB's)	Ft	0	\$24	\$0	
Sidewalk/ADA restore	Sq Ft	100	\$16	\$1,600	
Landscape Restore	Sq Yd	2900	\$6	\$17,400	
Native Shorline Stabilization	Ft	1150	\$35	\$40,250	
Tree Impacts	Ft	300	\$20	\$6,000	
Driveway Restore	Sq Ft	0	\$35	\$0	
Parking Lot / Entrance Restore	Sq Ft	0	\$40	\$0	
<b>Miscellaneous</b>					<b>\$110,350</b>
Temp Sed/Eros Control	Sq Yd	2900	\$4	\$11,600	
As-Built Drawings	L Sum	1	\$3,000	\$3,000	
Dewatering	L Sum	12.0%	\$167,940	\$20,160	
Movable Water Filled Cofferdams	L Sum	12.0%	\$167,940	\$20,160	
Maintenance of Traffic	L Sum	1.0%	\$167,940	\$1,680	
Construction Layout	L Sum	2.0%	\$167,940	\$3,360	
CCDD Testing/Disposal Fees	L Sum	1.0%	\$167,940	\$1,680	
Mobilization	L Sum	4.0%	\$167,940	\$6,720	
Contingency	L Sum	25.0%	\$167,940	\$41,990	
<b>Acquisition / Engineering / Management</b>					<b>\$100,200</b>
Land Acquisition - Widen Ex Perm Easement	Sq Ft	0	\$20	\$0	
Land Acquisition - Construction Easement	Sq Ft	0	\$10	\$0	
Design Engineering	L Sum	12.0%	\$278,290	\$33,400	
Permitting	L Sum	10.0%	\$278,290	\$27,830	
Construction Observation	L Sum	12.0%	\$278,290	\$33,400	
Administration Village	L Sum	2.0%	\$278,290	\$5,570	
<b>Note:</b>					
Soil information unknown					
Berm improvement = 150'x24' (HxW)					
Wetland improvement = 900'x24' (HxW)					
				<b>Grand Total</b>	<b>\$378,490</b>

Wheaton Exhibit 3 Alt-3					
Salsbury Ct / Nottingham Ln Bypas Sewer					
Element	Units	Quantity	Unit Price	Line Price	Element Price
<b>Storm Sewer System</b>					<b>\$842,400</b>
36" RCP	Ft	2895	\$120	\$347,400	
Inlets/12" Laterals	Ea	42	\$4,000	\$168,000	
Manholes/Risers	Ea	26	\$12,000	\$312,000	
End Sections	Ea	1	\$15,000	\$15,000	
<b>Utility Resotration</b>					<b>\$747,250</b>
Water Main Relocate	Ft	725	\$375	\$271,875	
Sanitary Sewer Relocate	Ft	725	\$275	\$199,375	
Wat/San Services Adjustments	Ea	92	\$3,000	\$276,000	
<b>Grounds Restoration</b>					<b>\$424,365</b>
Pvmt Recon over Pr Stm Sew	Sq Yd	3200	\$66	\$211,200	
Resurface lane adjacent to Pr Stm Sew	Sq Yd	3200	\$26	\$83,200	
Curb/Gutter Restore (one side + at CB's)	Ft	3315	\$24	\$79,560	
Sidewalk/ADA restore	Sq Ft	600	\$16	\$9,600	
Landscape Restore	Sq Yd	470	\$6	\$2,820	
Tree Impacts	Ft	900	\$20	\$18,000	
Driveway Restore	Sq Ft	571	\$35	\$19,985	
Parking Lot / Entrance Restore	Sq Ft	0	\$40	\$0	
<b>Miscellaneous</b>					<b>\$810,550</b>
Temp Sed/Eros Control	Sq Yd	470	\$4	\$1,880	
As-Built Drawings	L Sum	1	\$3,000	\$3,000	
Dewatering	L Sum	4.0%	\$2,014,015	\$80,570	
Maintenance of Traffic	L Sum	2.0%	\$2,014,015	\$40,290	
Construction Layout	L Sum	1.0%	\$2,014,015	\$20,150	
CCDD Testing/Disposal Fees	L Sum	1.0%	\$2,014,015	\$20,150	
Private Utility Adjustments	L Sum	3.0%	\$2,014,015	\$60,430	
Mobilization	L Sum	4.0%	\$2,014,015	\$80,570	
Contingency	L Sum	25.0%	\$2,014,015	\$503,510	
<b>Acquisition / Engineering / Management</b>					<b>\$633,340</b>
Land Acquisition - Widen Ex Perm Easement	Sq Ft	2280	\$20	\$45,600	
Land Acquisition - Construction Easement	Sq Ft	2280	\$10	\$22,800	
Design Engineering	L Sum	7.5%	\$2,824,565	\$211,850	
Permitting	L Sum	2.5%	\$2,824,565	\$70,620	
Construction Observation	L Sum	8.0%	\$2,824,565	\$225,970	
Administration Village	L Sum	2.0%	\$2,824,565	\$56,500	
				<b>Grand Total</b>	<b>\$3,457,905</b>

Wheaton Exhibit 3 Alt-4 Cheshire Ln / Winsor Dr Bypass Sewer					
Element	Units	Quantity	Unit Price	Line Price	Element Price
<b>Storm Sewer System</b>					<b>\$4,887,500</b>
48" RCP	Ft	0	\$200	\$0	
10'x4' Box Culvert	Ft	2350	\$1,150	\$2,702,500	
8'x5' Box Culvert	Ft	1500	\$1,100	\$1,650,000	
Inlets/12" Laterals	Ea	52	\$4,000	\$208,000	
Manholes/Risers	Ea	26	\$12,000	\$312,000	
End Sections	Ea	1	\$15,000	\$15,000	
<b>Utility Restoration</b>					<b>\$390,950</b>
Water Main Relocate	Ft	463	\$375	\$173,625	
Sanitary Sewer Relocate	Ft	463	\$275	\$127,325	
Wat/San Services Adjustments	Ea	30	\$3,000	\$90,000	
<b>Grounds Restoration</b>					<b>\$897,964</b>
Earth Excavation	Cu Yd	0	\$35	\$0	
Pvmt Recon over Pr Stm Sew	Sq Yd	10300	\$66	\$679,800	
Resurface lane adjacent to Pr Stm Sew	Sq Yd	2534	\$26	\$65,884	
Curb/Gutter Restore (one side + at CB's)	Ft	3470	\$24	\$83,280	
Sidewalk/ADA restore	Sq Ft	1400	\$16	\$22,400	
Landscape Restore	Sq Yd	2350	\$6	\$14,100	
Baseball Field replacement	Ea	0	\$50,000	\$0	
Field drainage system	Sq Yd	0	\$15	\$0	
Tree Impacts	Ft	50	\$20	\$1,000	
Driveway Restore	Sq Ft	900	\$35	\$31,500	
Parking Lot / Entrance Restore	Sq Ft	0	\$40	\$0	
<b>Miscellaneous</b>					<b>\$2,483,000</b>
Temp Sed/Eros Control	Sq Yd	2350	\$4	\$9,400	
As-Built Drawings	L Sum	1	\$3,000	\$3,000	
Dewatering	L Sum	4.0%	\$6,176,414	\$247,060	
Maintenance of Traffic	L Sum	2.0%	\$6,176,414	\$123,530	
Construction Layout	L Sum	1.0%	\$6,176,414	\$61,770	
CCDD Testing/Disposal Fees	L Sum	1.0%	\$6,176,414	\$61,770	
Private Utility Adjustments	L Sum	3.0%	\$6,176,414	\$185,300	
Mobilization	L Sum	4.0%	\$6,176,414	\$247,060	
Contingency	L Sum	25.0%	\$6,176,414	\$1,544,110	
<b>Acquisition / Engineering / Management</b>					<b>\$1,775,200</b>
Land Acquisition - Widen Ex Perm Easement	Sq Ft	0	\$20	\$0	
Land Acquisition - Construction Easement	Sq Ft	0	\$10	\$0	
Design Engineering	L Sum	7.5%	\$8,659,414	\$649,460	
Permitting	L Sum	3.0%	\$8,659,414	\$259,790	
Construction Observation	L Sum	8.0%	\$8,659,414	\$692,760	
Administration Village	L Sum	2.0%	\$8,659,414	\$173,190	
			<b>Grand Total</b>	<b>\$10,434,614</b>	

**Wheaton Exhibit 3 Alt-5****Briar Patch Park Bypass and Cheshire Ln / Winsor Dr Bypass Sewer (Alt-1 and Alt-4)**

Element	Units	Quantity	Unit Price	Line Price	Element Price
<b>Storm Sewer System</b>					
48" RCP	Ft	350	\$200	\$70,000	
10'x4' Box Culvert	Ft	2350	\$1,150	\$2,702,500	
8'x5' Box Culvert	Ft	1500	\$1,100	\$1,650,000	
Inlets/12" Laterals	Ea	58	\$4,000	\$232,000	
Manholes/Risers	Ea	31	\$12,000	\$372,000	
End Sections	Ea	3	\$15,000	\$45,000	
<b>Utility Resotration</b>					
Water Main Relocate	Ft	513	\$375	\$192,375	
Sanitary Sewer Relocate	Ft	513	\$275	\$141,075	
Wat/San Services Adjustments	Ea	30	\$3,000	\$90,000	
<b>Grounds Restoration</b>					
Earth Excavation	Cu Yd	70000	\$35	\$2,450,000	
Pvmt Recon over Pr Stm Sew	Sq Yd	10400	\$66	\$686,400	
Resurface lane adjacent to Pr Stm Sew	Sq Yd	2634	\$26	\$68,484	
Curb/Gutter Restore (one side + at CB's)	Ft	3550	\$24	\$85,200	
Sidewalk/ADA restore	Sq Ft	1800	\$16	\$28,800	
Landscape Restore	Sq Yd	54050	\$6	\$324,300	
Baseball Field replacement	Ea	3	\$50,000	\$150,000	
Field drainage system	Sq Yd	52400	\$15	\$786,000	
Tree Impacts	Ft	200	\$20	\$4,000	
Driveway Restore	Sq Ft	300	\$35	\$10,500	
Parking Lot / Entrance Restore	Sq Ft	217	\$40	\$8,680	
<b>Miscellaneous</b>					
Temp Sed/Eros Control	Sq Yd	54050	\$4	\$216,200	
As-Built Drawings	L Sum	1	\$3,000	\$3,000	
Dewatering	L Sum	4.0%	\$10,097,314	\$403,900	
Maintenance of Traffic	L Sum	2.0%	\$10,097,314	\$201,950	
Construction Layout	L Sum	1.0%	\$10,097,314	\$100,980	
CCDD Testing/Disposal Fees	L Sum	1.0%	\$10,097,314	\$100,980	
Private Utility Adjustments	L Sum	3.0%	\$10,097,314	\$302,920	
Mobilization	L Sum	4.0%	\$10,097,314	\$403,900	
Contingency	L Sum	25.0%	\$10,097,314	\$2,524,330	
<b>Acquisition / Engineering / Management</b>					
Land Acquisition - Widen Ex Perm Easement	Sq Ft	0	\$20	\$0	
Land Acquisition - Construction Easement	Sq Ft	0	\$10	\$0	
Design Engineering	L Sum	7.5%	\$14,355,474	\$1,076,670	
Permitting	L Sum	2.5%	\$14,355,474	\$358,890	
Construction Observation	L Sum	8.0%	\$14,355,474	\$1,148,440	
Administration Village	L Sum	2.0%	\$14,355,474	\$287,110	
					<b>Grand Total</b>
					<b>\$17,226,584</b>

*Appendix 4*  
*CD-ROM Containing XP-SWMM Files*

