Village of Villa Park

Comprehensive Flood Plan

Storm Sewer System Analysis

Villa Park, Illinois

Prepared for

Village of Villa Park

20 S Ardmore

Villa Park, Illinois 60181

June 2015

Prepared by

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

CBBEL Project No. 14-0092

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EXECUTIVE SUMMARY

This report presents the results of a comprehensive flood plan completed by Christopher B. Burke Engineering, Ltd. (CBBEL) at the request of the Village of Villa Park (Village). This comprehensive flood plan was developed in response to the widespread flooding experienced throughout the Village during the September 2008, July 2010 and April 2013 storm events. The only area of the Village excluded from this study is the southern portion of the Village that drains into Sugar Creek, which is being studied by V3 Companies.

Using information collected from Village staff, existing conditions computer models were developed to determine the cause of flooding and has narrowed the focus of the study to thirteen study areas located throughout the Village. To verify that the computer models were producing accurate results, they were calibrated to surveyed high water elevations collected from the April 2013 storm event and verified with the September 2008 and July 2010 storm event high water elevations.

Using the calibrated computer models, proposed drainage improvements were simulated to determine their flood reduction benefits. Proposed drainage improvements analyzed in this study included: increased storm sewer sizes, constructing relief sewers, creating flood storage in open space, providing flood storage underground, and floodwalls. Based on the results of the proposed conditions computer modeling, it is evident that significant expenditures will be required to increase the level of flood protection to a 100-year event in the study areas for the thirteen study areas. The conceptual cost estimates for the proposed improvements range from $215,000 to $18.82 million. These costs do not include land acquisition. A complete description of the costs and benefits of each project is included in this report. A summary of the study areas, project components and costs is summarized in Table 1-1.

Alternative ID	Cost
400 S Monterey Ave Alternative 1	$18.4 million
400 S Monterey Ave Alternative 2	$14.4 million
Astor Ct & Myrtle Ave	$1.53 million
Washington St	$4.20 million
Elm St	$4.37 million
Summit Ave	$955,000
Villa Ave & Summit Ave	$2.05 million
Twin Lakes	$3.31 million
Odeum	$1.20 million
Michigan Ave	$3.86 million
Riordan Rd	$439,000
Charles Ave	$1.69 million
Rotary Park – Alternative 1	$288,000
Rotary Park – Alternative 2	$342,000
Rotary Park – Alternative 3	$215,000
Brer Rabbit Motel	$1.71 million

Table 1-1 Alternative Analysis Summary

CHAPTER 1 PROJECT OVERVIEW

1.1 INTRODUCTION

The Village of Villa Park (Village) is a mostly residential community with a total area of 4.7 square miles and a population of approximately 22,000 people. As the Village began developing from the 1920-1950s, a combined sewer system was constructed to control the sanitary waste and the stormwater runoff, which was common practice for communities developed around the same time. A combined sewer system is one which a single pipe is used to convey both sanitary sewage and stormwater runoff. Since the late 1970's, the Village has been converting portions of the combined sewer into separate sanitary and storm sewer systems.

The Village is currently served by three different types of underground conveyance systems for stormwater runoff: combined sewer that receives storm sewer runoff, a separate sewer draining into the combined sewer and a separated storm sewer. New storm and sanitary sewers have been constructed and used in conjunction with the existing combined sewers as part of a phased sewer separation project throughout the Village.

The Village is tributary to two separate watersheds: Salt Creek and Sugar Creek, which is a tributary to Salt Creek. Approximately 870 acres is tributary to Sugary Creek and 2,130 acres is tributary to Salt Creek. The study flood problem areas analyzed for this report are all directly tributary to Salt Creek. Most of the areas are located quite some distance away from the open channel stream system, therefore a majority of the flooding problems within the Salt Creek watershed are not associated with overbank flooding.

Village wide flooding occurred during the September 2008, July 2010 and April 2013 storm events. The April 2013 storm event was particularly devastating, when nearly 9 inches of rain was measured in 24 hours according to the Village's Wet Weather Flow Treatment Facility. The depth and duration (intensity) of the precipitation measured during the April 2013 storm event exceeded a 100-year storm event according to rainfall depths and durations published in the Illinois State Water Survey (ISWS) Frequency Distributions and Hydroclimatic Characteristics of Heavy Rainstorms in Illinois Bulletin 70 (Bulletin 70). Bulletin 70 is the widely accepted rainfall study used to design stormwater management infrastructure in Northeastern Illinois. The 100-year design storm event refers to a storm event that has a 1% chance of occurring in any given year. During the April 2013 storm event, the existing sewer system could not handle the large runoff volumes, resulting in flooding of both structures and streets. In addition to overland flooding, sanitary sewer backups also occurred. Because the Village is partially served by combined sewers, several areas experienced combined sewer overflows (CSOs).

In response to these three storm events, the Village hired Christopher B. Burke Engineering, Ltd. (CBBEL) to complete a comprehensive flood plan for the Village for the Salt Creek portion of the Village. The main objective of the study was to analyze key flood problem areas and to develop concept-level drainage improvements to eliminate CSOs and reduce flooding in each area.

Concept-level cost estimates for the proposed improvements were also prepared. Existing conditions, concept level flood risk reduction alternatives and associated estimated costs of construction are described per study area in Chapters 2 through 11.

1.2 PURPOSE AND SCOPE

The purpose of this study is to analyze the existing conditions level of protection and develop drainage improvement projects for the portion of the Village that drains into Salt Creek. The drainage improvements proposed are designed to provide a 100-year level of protection, where feasible. While there may be additional areas within the Village that have less than a 100-year level of protection, the focus was to maximize the level of protection for the study areas. It was assumed that a maximum of 0.5 foot of street ponding was acceptable. All projects have been designed to not have adverse upstream or downstream impacts and to not increase the flow rates in the system outlet at Salt Creek.

The scope of services included the following tasks:

- Review all background data for 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;
- 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 Village illustrating the existing flooding problems and recommended improvements.

1.3 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
Village of Villa Park	• Village GIS Database of Sewer Network
Village of Villa Park	• As-built Plans
Village of Villa Park	• High Water Marks for July 2010, July 2011 & April 2013 Storm Events
Village of Villa Park	• Villa Park 1-foot Aerial Topography

Village of Villa Park	• Open Space Parcel Data
V3 Companies	• Inflow Hydrographs for Interbasin Flow between Sugar Creek and Salt Creek
RJN Group	• Combined Sewer Watershed Divides
RJN Group	• Survey Data of Various Structures
CBBEL	• Site Visits & Meetings with Village Staff

Table 1-2 Data Sources

1.4 STUDY METHODOLOGY

Once the initial data was collected, it was clear that there were areas of the Village that would require additional analysis to determine the source of flooding within the area. Thirteen flood study areas were analyzed to determine the existing level of flood protection and develop concept-level drainage improvements to reduce the frequency and severity of flooding. Areas served by combined sewers were also analyzed for separation of the sewers. The thirteen flood study areas (shown on Figure 1-1 and Exhibit 1) were identified by both CBBEL and Village staff based on historic flood problem areas, and consist of the following locations:

1) 400 S Myrtle Avenue

2) Astor Court & Myrtle Avenue

3) Washington Street

4) Elm Street (from Michigan Avenue to Ardmore Avenue)

5) Summit Avenue (from Division Street to St. Charles Road)

6) Villa Avenue and Summit Avenue (from UPRR to Charles Avenue)

7) Twin Lakes

8) Odeum

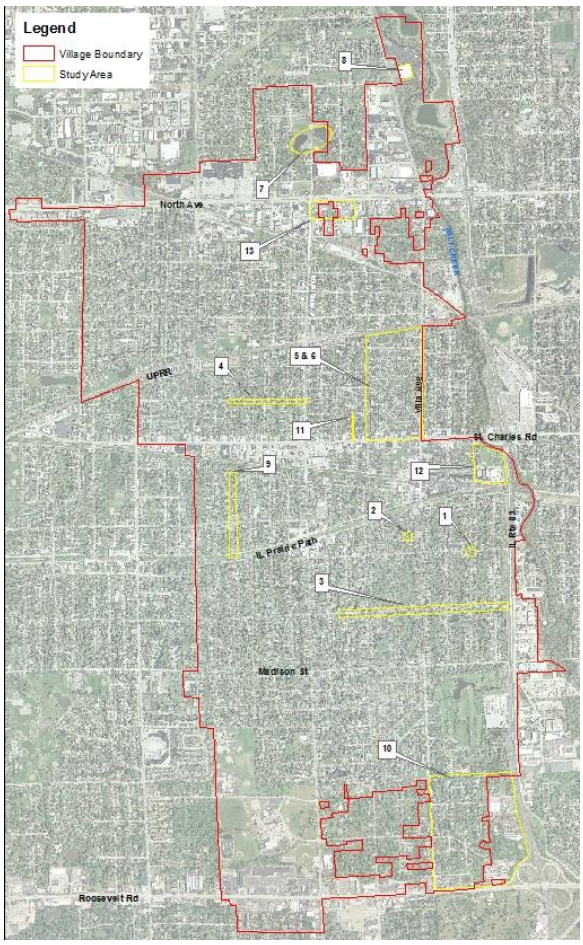

Figure 1-1 Location Map (Thirteen Study Areas)

9) Michigan Avenue (from Kenilworth Avenue to Central Boulevard)

10) Riordan Road

11) Charles Avenue

12) Rotary Park

13) Brer Rabbit Motel

The thirteen study areas were analyzed using the XP-SWMM computer software, which is a proprietary program based on the United States Environmental Protection Agency's (EPA) Storm Water Management Model (SWMM). XP-SWMM is a dynamic hydrologic and hydraulic modeling program that is ideal for analyzing stormwater management systems. XP-SWMM simulates rainfall-runoff responses for user-specified storm events (hydrologic component) and analyzes the performance of the stormwater management system (hydraulic component).

As described above, there are two main components to the XP-SWMM model: the hydrologic component (watershed characteristics, impervious area, topography, etc.) and the hydraulic component (sewer size, slope, material, etc.). Input for the hydrologic and hydraulic components was collected from various sources, as described in section 1.3

To develop the hydrologic component of the computer model, each study area was delineated into subbasins based on the Village's one-foot aerial topography and sewer location. All subbasins were correlated to the combined sewer subbasins delineated by RJN. TR-20 methodology hydrologic parameters, such as area, impervious percentage, and time of concentration, were determined based on topography and current land use. The impervious percentage predicts the runoff response for each subbasin. The time of concentration is the time for runoff to travel from the hydraulically most distant point of the subbasin to the outlet.

The hydraulic elements of the model, including sewer diameters, lengths, material, slopes, etc., were taken from the Village's GIS database and supplemented by survey information received from RJN and as-built plans. In addition to the sewer network, overland flow routes and depressional storage areas were entered into the model using the aerial topography. If a sewer did not have sufficient capacity to convey the tributary runoff, the water surcharges out of the manhole rim. When this occurs, water will flow by gravity along the overland flow routes that follow the topography. Where overland flow routes converge at depressional areas, ponding areas were entered into the model so that the depth and volume of ponding could be determined.

Using precipitation data provided from the Village, the April 2013 storm event was simulated using the XP-SWMM model for each study area. During this storm event, approximately 9 inches of rain fell in approximately 24 hours, as shown in Figure 1-2. The results of the models were compared to high water marks collected by Village staff from the April 2013 storm event. The

hydrologic parameters for each study area were adjusted until the modeled results matched the observed elevations. During the April 2013 storm event, the existing combined and storm sewer systems could not handle the large runoff volumes, resulting in the flooding of several homes. In addition to overland flooding, many houses experienced sanitary sewer backups due to the large volume of stormwater that entered the sanitary sewer system.

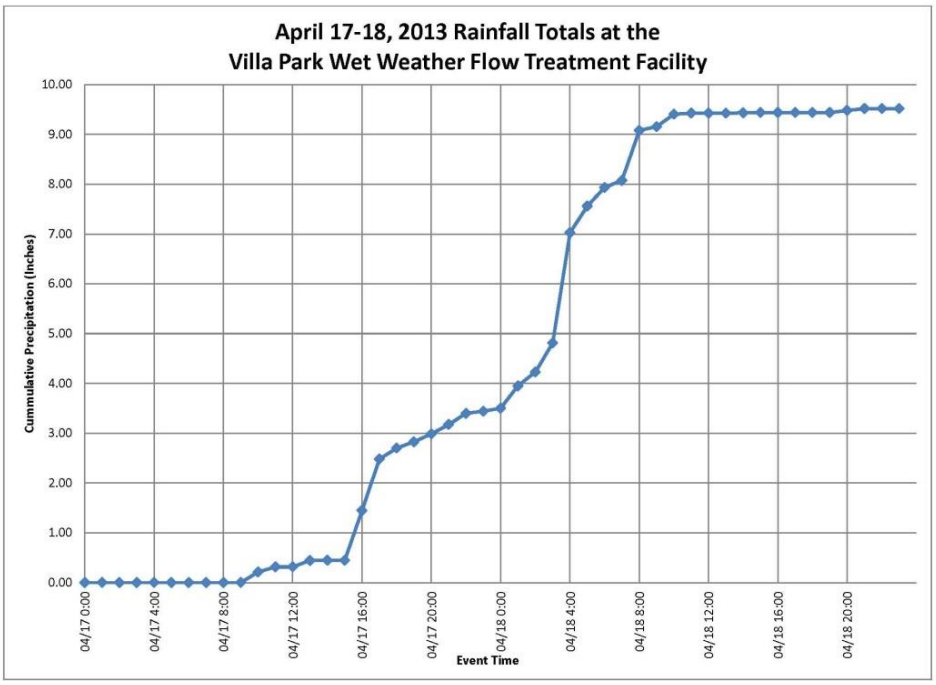

Figure 1-2 April 2013 Storm Event

Once the models were calibrated, a critical duration analysis was performed for each study area. The critical duration storm was determined for each study area using rainfall depths published in Bulletin 70. The critical duration storm refers to the storm duration that produces the highest flowrates and flood elevations. To determine the existing level of flood protection for each study area, the critical storm duration was simulated for the 2-, 5-, 10-, 25-, 50-, and 100-year return

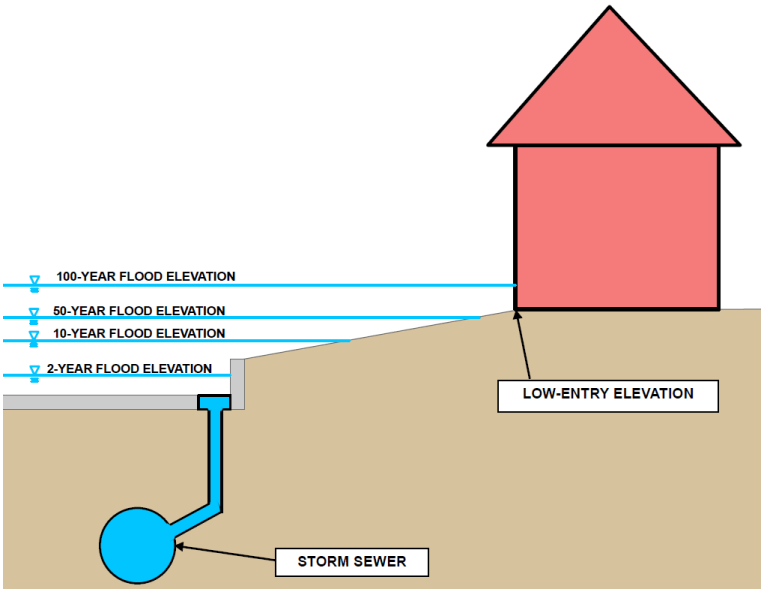

Figure 1-3 Level of Protection

intervals. The level of protection is defined as the highest flood frequency that does not result in flood damage. An example of a level of protection is shown on Figure 1-3.

Based on the results of the results of the XP-SWMM modeling, the cause of flooding was identified and the flood reduction benefits for the various proposed drainage improvements were analyzed for each study area. The proposed drainage improvements analyzed in the study include: new storm sewers, construction of relief sewers, and creation of flood storage (above-ground and underground). Using the XP-SWMM existing conditions models, the proposed improvements were analyzed to determine their associated flood reduction benefits. Because several of the study areas are located within the same drainage basin, these study areas were combined into one XP-SWMM model to determine the impact that any improvements would have on the other study areas within that same watershed. However, the proposed improvements for each study area were analyzed as independent project. Four separate XP-SWMM models were developed and the study areas analyzed within each one is summarized below:

1) Study Areas 1, 2, 3 and 9
2) Study Areas 4, 5, 6, 11, 12
3) Study Areas 7 and 13
4) Study Area 10

*Study Area 8 (The Odeum) was not studied using XP-SWMM hydraulic modeling, so it is not listed above.

Concept level cost estimates were prepared for each proposed drainage improvement alternative. There are many unknowns that can affect the ultimate design and cost of the project, including utility conflicts, soil conditions and right-of-limits. Due to these uncertainties, a 30% contingency has been added to the engineer's estimate of probable cost. Engineering for each project has also been included in the estimate as 7.5% of the total cost of the project. The cost estimates do not include such items as land acquisition, temporary/permanent construction easements, relocation of utilities, and the cost of recreation facilities open space.

The following sections of the report have been organized by study area. Each section details the existing and proposed condition study area and provides the engineer's estimate of probable cost for each alternative.

CHAPTER 2 400 S MONTEREY

2.1 EXISTING CONDITIONS

400 South Monterey Avenue is located at the intersection of Highland Avenue and Monterey Avenue, as shown on Figure 2-1. This study area is drained by both combined and separate storm sewer systems.

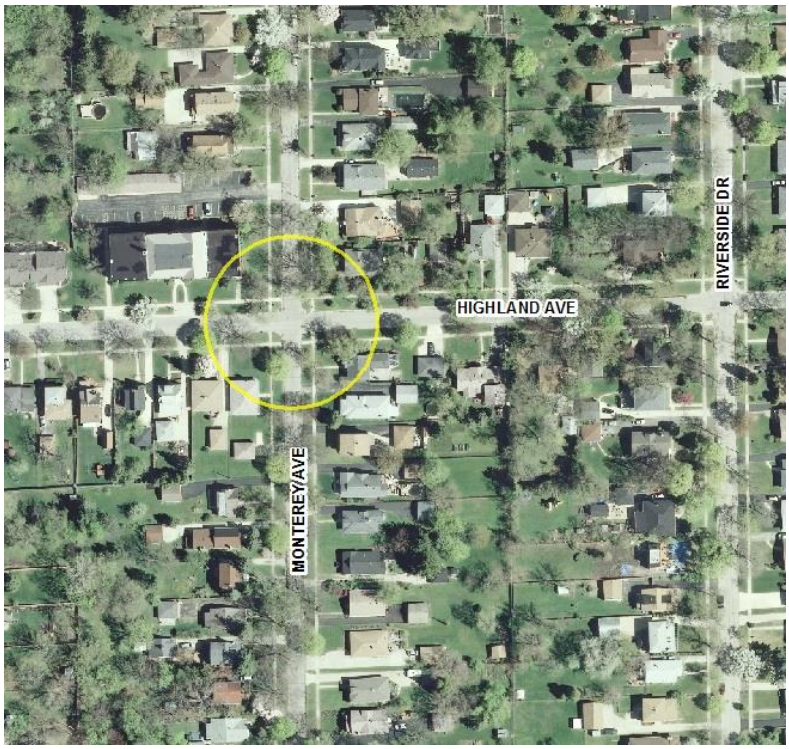

Figure 2-1 400 S Monterey Avenue

The storm sewer system drainage area to the study area measures approximately 353 acres and the combined sewer drainage area measures approximately 67 acres. The general drainage patterns in the study area are from west to east towards Salt Creek. There is a low-lying area along Monterey Avenue located just south of the intersection with Highland Avenue that has flooded during past storm events. Local drainage along Monterey Avenue is collected by a 48" combined sewer flowing north from Washington Street to Highland Avenue. During large storm events, a separate storm sewer system to the south surcharges and contributes additional flow to the combined sewer system upstream of the problem area. Additionally, there is a large volume of overland flow from the Washington Street flood area that flows northeast through the rear yards and continues past Oakland Avenue into the flood depression on Monterey Avenue. The flood depression outlets via the combined sewer that flows north along Monterey Avenue. Once the depression overtops, the overland flow route is northeasterly through the rear yards of the homes located on both Monterey Avenue and Highland Avenue, and continues east on Highland Avenue.

For storm events greater than the 5-year return interval, the Monterey Avenue combined sewer surcharges at the low point in the street and ponds in the street. Significant structural flooding at this location has been reported during large storm events which is reflected in the existing conditions model. Approximately 3 feet of flooding is shown for the 100-year event in the existing conditions model. Because the flooding in this area creates a CSO, the goal of this project is to separate the combined sewer system upstream, which will provide flood reduction benefits to this study area.

2.2 PROPOSED CONDITIONS

Various proposed improvements were evaluated to reduce flooding for the 100-year storm in this study area. To provide 100-year flood reduction, new flood storage is required in addition to new sewer infrastructure. Because combined sewer water contributes to the flooding along Monterey Avenue, upstream areas of the watershed drained by the combined sewer system must be separated before above-ground flood storage can be provided. Additionally, the 48" CSO will be converted to a separate storm sewer outfall so there is no increase in flowrates to Salt Creek. There are two options for separating the combined sewer system draining through the problem area. One option is to convert the combined sewers to separate storm sewers and provide a new separate sanitary sewer system in the area (Exhibit 12). There are no new sewers proposed on Wisconsin Avenue and Michigan Avenue because a sewer study by V3 Companies includes the sewer separation along these two streets. New sanitary sewer is still proposed along Addison Street because the downstream combined sewer is being converted to a separate storm sewer with this option. The second option is to provide new storm sewers to collect runoff previously drained by the combined sewer system and convert the existing 48" CSO to Salt Creek to a separate storm sewer outfall (Exhibit 13). Similar to the previous option, no new storm sewers are proposed along Wisconsin and Michigan Avenue because a sewer study by V3 Companies includes the sewer separation along these two streets. The second option assumes that the wastewater treatment plant can handle all sewage and inflow and infiltration from the newly separated existing combined sewer line.

Both sewer separation options effectively convey stormwater to the proposed above ground flood storage facilities with nearly identical flood reduction benefits. The proposed improvements result in a 2.8-foot flood reduction on Monterey Avenue for the 100-year storm event when combined with the Washington Street flood improvement discussed in Chapter 3. Minimal roadway ponding will occur with this improvement and the houses within the existing inundation area will have a 100-year level of protection under proposed conditions. The proposed improvements are shown on Exhibit 2.

Sewer Separation & New Flood Storage Basins

This Alternative, as shown on Exhibit 2, provides benefits for the 100-year storm in this study area through the following drainage improvements:

- Provide 3.9 acre-feet of new flood storage between Oakland Avenue and Monterey Avenue. This alternative requires the buyout of five existing lots for construction of the storage basin.
- Provide 1.6 acre-feet of new flood storage volume east of Monterey Avenue, utilizing a vacant parcel and two residential rear yards.
- Convert the existing 48" CSO to Salt Creek to a separate storm sewer outfall.
- Convert existing combined sewer to storm sewer only and provided new sanitary sewers, or provide new storm sewers to collect runoff previously drained by the combined sewer system.
- Installation of 29,500 feet of new sanitary sewer or 17,500 feet of new storm sewer.

Project Components	Comments	Engineer's Estimate of Probable Cost
• 5.5 acre-feet of new flood storage • Convert existing combined sewer and provide new sanitary sewer or provide new storm sewer.	• The sewer separation must take place prior to the creation of flood storage and before this area receives any flood reduction benefits. • Requires the buyout of five existing lots for construction of above-ground flood storage • Requires the utilization of two rear yards of existing residential homes • Requires construction of new storm sewer between side yards[1]	$3.8 million – Flood storage improvements Plus $13.0 million – New sanitary sewer Or $9.7 million – New storm sewer

[1] *Easements will need to be obtained from the property owners.*

Table 2-1 400 S Monterey Ave Recommended Project Summary

While these improvements provide flood reduction benefits along Monterey Court for the 100-year event; complete 100-year flood protection is provided when this improvement is implemented in combination with the Washington Street improvement discussed in Chapter 4. The combination of these two improvements result in a 2.6 foot flood reduction, leaving approximately 3 inches of ponding at the lowest catch basin on Monterey Avenue. Additionally, the proposed 42" storm sewer draining the east storage area north between side yards is no longer required with the Wisconsin improvements. It is recommended that the Washington Street improvements discussed in Chapter 4 be implemented in conjunction with the Monterey Avenue improvements to maximize the benefits in both problem areas.

CHAPTER 3 WASHINGTON STREET

3.1 EXISTING CONDITIONS

The Washington Street study area extends from Illinois Street on the west to IL Route 83 on the east, as shown on Figure 3-1. This study area is drained by both combined and separate storm sewer systems.

Figure 3-1 Washington St

The storm sewer system drainage area to the study area is approximately 63 acres and the combined sewer drainage area is approximately 54 acres. The general drainage pattern is from west to east along Washington Street with the north-south streets draining towards Washington Street. Two different flooding areas were identified within the Washington Street corridor. Both flooding areas are caused by roadway depressions on Washington Street that lack overland flow outlets. The west flood area is located between Illinois Avenue and Summit Avenue and the east flood area is located between Euclid Avenue and Villa Avenue.

Both flood prone areas have a 2-year level of protection under existing conditions. The west flood area is drained exclusively by an 8" combined sewer at the upstream end of the combined sewer line flowing east along Washington. Flooding is the result of insufficient sewer capacity as well as overland flow from storm sewer surcharge to the west. The storm sewers along Cornell Avenue and Illinois Avenue surcharge and then overflow east on Washington Street to the west depression. During the 100-year storm, 81 cfs flows overland to the west depression from Illinois Street.

The east flood area is drained exclusively by an 18" storm sewer flowing east on Washington Street that ties into a storm sewer flowing south down Villa Avenue draining to Sugar Creek. The depressional flooding at this location is the result of insufficient sewer capacity and

overland flow from combined sewer surcharge to the west. During the 100-year storm, 63 cfs overflows from Euclid Avenue into the east flood area.

3.2 PROPOSED CONDTIONS

Several improvements were evaluated for this area since it has been listed as an area in the Capital Improvement Plan (CIP) for future separation of the combined sewer. The proposed improvements were evaluated to provide a 100-year level of flood protection for the study area. To provide a 100-year level of protection, new flood storage is required in addition to separating the combined sewer system that drains through the problem area. Sewer separation is required so that only storm water is directed to the proposed above ground flood storage basins. Additionally, the combined sewer in this area drains northeast through the Monterey Avenue flood problem. Therefore, one of the sewer separation options discussed in Section 2.2 is also required as part of the Washington Street flood improvement project. Either the combined sewers will be converted to a separate storm sewer requiring new sanitary sewers (Exhibit 12), or new storm sewers will collect runoff previously drained by the combined sewer system (Exhibit 13).

This improvement significantly reduces flooding for the 100-year storm, removing all homes from the existing inundation area as well as providing significant flood reduction to the Monterey Avenue flood problem downstream. The proposed improvements are shown on Exhibit 3.

Sewer Separation & New Flood Storage Basins

This Alternative, as shown on Exhibit 3, provides benefits for the 100-year storm in this study area through the following drainage improvements:

- Provide 2.8 acre-feet of new flood storage southwest of the intersection of Washington Street and Summit Avenue. This alternative requires the buyout of three existing lots for construction of the storage basin.
- Provide 4.1 acre-feet of new flood storage volume north of Washington Street between Euclid Avenue and Villa Avenue. This alternative requires the buyout of three existing lots and easements for five residential rear yards.
- Monterey sewer separation required for this improvement:
  - Convert the existing 48” CSO to Salt Creek to a separate storm sewer outfall.
  - Convert existing combined sewer to storm sewer only and provided new sanitary sewers, or provide new storm sewers to collect runoff previously drained by the combined sewer system.
  - Installation of 29,500 feet of new sanitary sewer or 17,500 feet of new storm sewer.

Project Components	Comments	Engineer's Estimate of Probable Cost
• 6.9 acre-feet of new flood storage • Monterey sewer separation required to complete Washington Street improvements	• Requires the buyout of six existing lots for construction of above-ground storage • Requires the utilization of five rear yards of existing residential homes	$4.2 million – Flood storage improvements

Table 3-1 Washington St Recommended Project Summary

In addition to the Washington Avenue improvements, the Village asked CBBEL to investigate potential options for separating the combined sewer along Euclid Ave that drains to the Washington Street combined sewer and ultimately to the Salt Creek CSO. In order to exclusively separate the Euclid Avenue combined sewer line, the existing combined lines should be converted to sanitary sewers and new storm sewers are required to drain the newly separated area. There are two options to drain the proposed storm sewers along Euclid. The first option is to tie the proposed storm sewer into the existing storm sewer along Washington between Euclid and Villa Avenue. This existing storm sewer then drains south down Villa Avenue and into Sugar Creek. The second option is to route the proposed storm sewer north along Euclid Avenue and tie into the existing storm sewer draining east down Highland Avenue. This existing storm sewer continues east and drains into Salt Creek. CBBEL has not performed modeling to analyze the proposed storm sewer's impact on the existing sewer system.

CHAPTER 4 ASTOR COURT AND MYRTLE AVENUE

4.1 EXISTING CONDITIONS

The Astor Court/Myrtle Avenue study area is located west of Villa Avenue and north of Highland Avenue, as shown on Figure 4-1. This study area is drained exclusively by combined sewers.

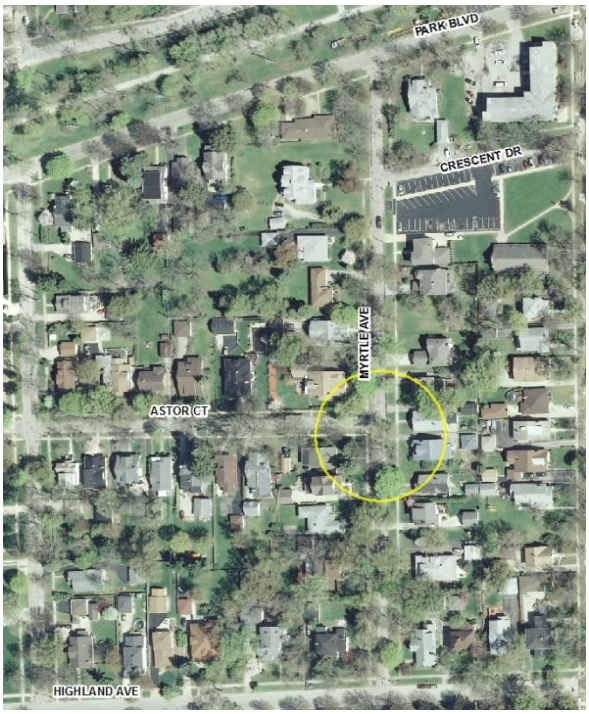

Figure 4-1 Astor Ct & Myrtle Ave

The drainage area for the study area is approximately 12.5 acres. The general drainage pattern is from west to east on Astor Court and then north along Myrtle Avenue to the combined sewer on Park Boulevard. Due to lack of stormwater conveyance in this study area, the combined sewer overflows for events greater than the 2-year frequency. The 12" combined sewer along Astor Court is surcharges and overland flow travels east towards the intersection of Astor Court and Myrtle Avenue. The overland flow route continues north along Myrtle Avenue then flows east along Crescent Boulevard towards the 24" storm sewer on Villa Avenue. For the 100-year storm, there is approximately 61 cfs of overland flow leaving the study area north on Myrtle Avenue.

4.2 PROPOSED CONDITIONS

Several improvements were evaluated for this area since it has been listed as an area in the Capital Improvement Plan (CIP) for future separation of the combined sewer. The proposed improvements were evaluated to provide a 100-year level of flood protection for the study area. To provide a 100-year level of protection, new flood storage is required in addition to

new storm sewers. The new flood storage will mitigate any increase in flow to the existing storm sewer system. The proposed improvements are shown on Exhibit 4.

Relief Sewer & New Flood Storage Basins

This Alternative, as shown on Exhibit 4, provides a 100-year level of protection in this study area through the following drainage improvements:

- Installation of 230 feet of 24" diameter storm sewer along Astor Court to separate the existing combined sewer system.
- Installation of 730 feet of 36" diameter storm sewer along Myrtle Avenue from Crescent Drive south to Highland Avenue to separate the existing combined sewer system. This new storm sewer will tie into the mainline 60" storm sewer that flows east along Highland Avenue.
- Provide 0.8 acre-feet of underground storage in the parking lot located at the southeast corner of the intersection of Myrtle Avenue and Crescent Boulevard.
- Provide 0.3 acre-feet of above-ground storage in the vacant parcel located at 259 South Myrtle Avenue.

Project Components	Comments	Engineer's Estimate of Probable Cost
• 0.3 acre-feet of above-ground storage • 0.8 acre-feet of underground storage • Install 230 linear feet of 24" storm sewer & 730 linear feet of 36" storm sewer	• Project eliminates combined sewer overflow. • Results in no impact to the existing downstream storm sewer system. • 61 cfs of combined sewer overland flow on Myrtle reduced to 19 cfs of storm sewer overland flow for the 100-year storm	$1.53 million

Table 4-1 Astor Ct & Myrtle Ave Recommended Project Summary

CHAPTER 5 ELM STREET

5.1 EXISTING CONDITIONS

The Elm Street study area is bounded by Michigan Avenue on the west and Ardmore Avenue on the east, as shown in Figure 5-1. This study area is drained by three separate sewer systems: combined, separate draining to combined and separate.

Figure 5-1 Elm St

The drainage area for the Elm Street corridor is approximately 225 acres, including overflow from areas not directly tributary via storm or combined sewer. The general drainage patterns in the study area are from west to east towards Ardmore Avenue and from south to north towards Division Street. There is a low spot in the intersection of Harvard Avenue and Elm Street where surcharging first begins. Once this area overtops, it flows easterly. There is also a low spot in the rear yards of the homes between Harvard Avenue and Yale Avenue on the north side of Elm Street that serves as an overland flow route for the sewers from the west. The primary outlet for the Elm Street corridor is a combined sewer that ranges is size from a 24" diameter at Michigan Avenue and to a 33" at Ardmore Avenue.

For storm events greater than the 5-year return interval storm event, the Elm Street combined sewer surcharges at the low point and ponds in the street. There is overland flow from the southwest that is tributary to this low point for storms greater than the 25-year frequency. Structural flooding at this study area has been reported and it is a combined sewer overflow (CSO) location. Based on the XP-SWMM computer modeling, there is approximately 2.5 feet of ponding on Elm Street at the low point during the 100-year event.

5.2 PROPOSED CONDITIONS

Various proposed improvements were evaluated to provide a 100-year level of flood protection for the study area. To provide a 100-year level of protection, new flood storage is required in addition to new storm sewers. These improvements include separating the combined sewer along 2nd Avenue to alleviate a portion of the upstream storm sewer overflow that is tributary to the Elm Street combined sewer system. The proposed improvements are shown on Exhibit 5.

Sewer Separation & New Flood Storage Basins

This Alternative, as shown on Exhibit 5, provides a 100-year level of protection in this study area through the following drainage improvements:

- Provide 2.1 acre-feet of storage volume at the southwest corner of Harvard Avenue and Elm Street
- Provide 1.0 acre-feet of stormwater storage volume in an underground vault along St. Charles Road.
- Provide 2.0 acre-feet of stormwater storage volume in existing church lot located on St. Charles Road, which will require a buyout.
- Installation of 215 linear feet of 18" storm sewer and 255 linear feet of 36" storm sewer along 2nd Avenue. This improvement separates the combined sewer along 2nd Avenue, but without stormwater storage does not provide a 100-year level of protection.
- Installation of 560 linear feet of 24" storm sewer along Elm Street between 3rd Avenue and Wisconsin Avenue, tying into the existing storm sewer along Addison Road.
- Installation of 1,200 linear feet of 4' x 4' RCBC along Harvard Avenue, discharging into the proposed underground storage facility along St. Charles Road. This improvement separates the combined sewer along Harvard Avenue between St. Charles Road and Elm Street.

Project Components	Comments	Engineer's Estimate of Probable Cost
• 4.1 acre-feet of above-ground storage • 1.0 acre-feet of underground storage • 2,230 linear feet of storm sewer	• Utilizes an existing park facility • Extensive Overburden • Requires buyout • Removal of existing church building	$4.37 million

Table 5-1 Elm St Recommended Project Summary

CHAPTER 6 SUMMIT AVENUE

6.1 EXISTING CONDITIONS

The Summit Avenue study area is located between Maple Street on the north and Division Street on the south, as shown in Figure 5-1. This study area is drained by three separate sewer systems: combined, separate draining to combined and separate.

Figure 6-1 Summit Ave

The tributary area to the study area is approximately 30 acres, including overland flow. The general drainage pattern is from west to east towards a low spot at the intersection of Pine Street and Summit Avenue. Pine Street is served by a combined sewer that flows from west to east and once it surcharges, it flows towards to the low spot at Summit Avenue and Pine Street. The main storm outlet flows from west to east and then southeast down Division Street. The main overland flow route is southwest towards a depression located at the northeast corner of Division Street and Summit Avenue. Structural flooding has been reported within this study area and it is a CSO location.

6.2 PROPOSED CONDITIONS

To provide a 100-year level of protection and separate the existing combined sewer system, new flood storage is required in addition to new storm sewers. The proposed improvements are shown on Exhibit 6.

Sewer Separation & New Flood Storage Basins

This Alternative, as shown on Exhibit 6, provides a 100-year level of protection in this study area through the following drainage improvements:

- Provide 0.2 acre-feet of storage volume at the northwest corner of Illinois Avenue and Division Street.
- Provide 0.9 acre-feet of stormwater storage volume in the low area behind the rear yards of the homes located northeast of Illinois Avenue and Division Street.
- Installation of 350 linear feet of 24" diameter storm sewer along Maple Avenue south and then tying into the storage basin northwest of Illinois Avenue and Division Street.
- Installation of 400 linear feet of 18" diameter storm sewer from the storage basin at the northeast corner of Illinois Avenue and Division Street, tying into the existing Division Street storm sewer.
- Installation of 500 linear feet of 18 inch diameter storm sewer along Summit Avenue, tying into the existing Division Street storm sewer.

Project Components	Comments	Engineer's Estimate of Probable Cost
• 1.1 acre-feet of above-ground storage • 1,250 linear feet of storm sewer	• Easements required to access storage facilities • Separation of Summit Avenue combined sewer north of Pine Street	$955,000

Table 6-1 Summit Ave Recommended Project Summary

CHAPTER 7 VILLA AVENUE AND SUMMIT AVENUE

7.1 EXISTING CONDITIONS

The Villa Avenue and Summit Avenue study area is located south of the railroad tracks and north of St. Charles Road, as shown on Figure 7-1. This study area is drained by three separate sewer systems: combined, separate draining to combined and separate.

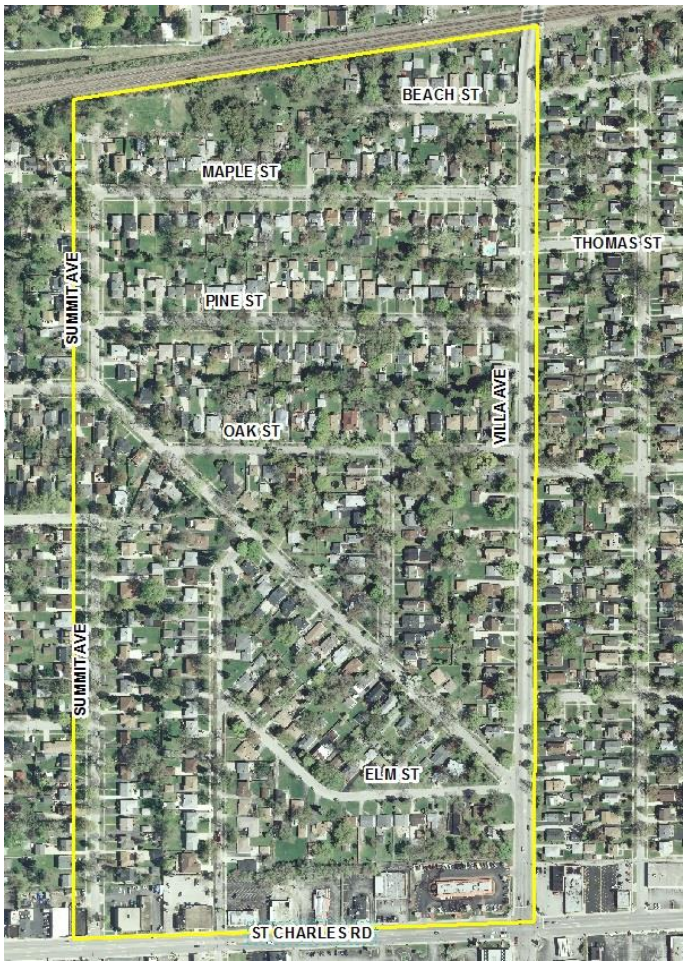

Figure 7-1 Villa Ave & Summit Ave

The area tributary to the study area is approximately 164 acres with a 2-year level of protection. The general drainage pattern is from west to east towards Salt Creek. The storm sewers in this area flow south towards the main trunk line running west to east along St. Charles Road and the combined sewer flows are conveyed via a 21" pipe flowing southeast along Division Street. There is approximately 22 cfs of overland flow in the 100-year storm event that enters into the combined sewer system, causing it to surcharge. There is a known flooding problem at the intersection of Thomas Street and Villa Avenue.

7.2 PROPOSED CONDTIONS

To provide a 100-year level of protection to various parts within this study area will require storm sewer improvements, above-ground storage volume and the separation of part of the combined sewer system, as shown on Exhibit 7, and listed below. It is recommended that these improvements be made in conjunction with the Summit Avenue upstream stormwater improvements described in Chapter 6 to provide even greater protection.

Sewer Separation & New Flood Storage Basins

- Provide 1.6 acre-feet of storage volume in an above-ground storage basin located north of Beach Street and east of Summit Avenue.
- Installation of 180 linear feet of 18" diameter storm sewer along Maple Street, replacing the existing combined sewer, and tying into the new Summit Avenue storm sewer.
- Installation of 610 linear feet of 2' x 2' RCBC along Maple Street, east of Summit Avenue, replacing the existing combined sewer, and tying into the new Summit Avenue storm sewer.
- Installation of 203 linear feet of 24" storm sewer on Summit Avenue, discharging into the proposed storage facility.
- Installation of 980 linear feet of 36" storm sewer along the rear yards west of Beach Street and replacing the existing Beach Street storm sewer.

Project Components	Comments	Engineer's Estimate of Probable Cost
• 1.6 acre-feet of above-ground storage • 2,000 linear feet of storm sewer	• Separates the combined sewers along Maple Street • Proposed storage basin is located in an open parcel south of the railroad • Does not eliminate the street flooding at Thomas Street and Villa Avenue	$2.05 million

Table 7-1 Villa Ave & Summit Ave Recommended Project Summary

CHAPTER 8 TWIN LAKES

8.1 EXISTING CONDITIONS

The Twin Lakes study area is located north of North Avenue and west of Chatham Avenue, as shown on Figure 8-1. This study area is located within a separate sewer area. Most of the homes in this area have a roadside ditch in the front yard with a driveway culvert. Primary causes of flooding in this study area are due to the minimal capacity provided by the existing conveyance system.

Figure 8-1 Twin Lakes

The drainage area tributary to Twin Lakes is 220 acres. The general drainage pattern in the study area is from west to east towards Twin Lakes. The primary outlet for the storm system is a 21" storm sewer that flows east, ultimately discharging into Salt Creek.

Flooding has been reported at various locations within the upstream conveyance systems that discharge into the western Lake. Based on the XP-SWMM computer modeling, there is approximately 0.5 foot to 2 feet of ponding at these locations.

8.2 PROPOSED CONDITIONS

Various proposed improvements were evaluated to provide a 100-year level of flood protection for the study area. To provide a 100-year level of protection, new flood storage is required in addition to new storm sewers. The proposed improvements are shown on Exhibit 8.

New Storm Sewer & Existing Basin Expansion

This Alternative provides a 100-year level of protection in this study area through the following drainage improvements:

- Provide 7.2 acre-feet of storage volume in the western lake by expanding the existing lake and maintaining the existing normal water level (NWL).
- Provide 1.0 acre-feet of storage volume in the existing depressional area, east of Yale Avenue and south of Sidney Avenue.
- Provide 0.5 acre-feet of storage volume east of Harvard Avenue and south of Sidney Avenue.
- Re-grade existing roadside on west side of Yale Avenue between Wildfire Drive and 912 North Yale Avenue.
- Installation of 485 linear feet of 3' x 2' RCBC between 912 Yale Avenue and the basin located east of Yale Avenue.
- Installation of 200 linear feet of 2' x 1' RCBC from the open parcel south of 923 Yale Avenue to the storage basin located east of Yale Avenue.
- Installation of 35 linear feet of 24" diameter storm sewer connecting to the existing storm sewer along Harvard Avenue and discharging into the new storage facility west of Yale Avenue.
- Installation of 20 linear feet of 24" diameter storm sewer connecting the proposed storage basin west of Yale Avenue to the existing low area north of this location.
- Installation of 250 linear feet of 10" storm sewer from the new storage basin located east of Harvard Avenue to the existing swale located east of Yale Avenue.
- Installation of 740 linear feet of 30" (span) x 19" (rise) elliptical pipe from the existing ditch north of Sidney Avenue to the western lobe of Twin Lakes.
- Installation of 500 linear feet of 36" storm sewer from the northeast intersection of Yale Avenue and Sidney Avenue to the western lobe of Twin Lakes.
- Installation of 125 linear feet of 18" storm sewer from the Yale Avenue western roadside ditch, north of Sidney Avenue, and connecting to the western lobe of Twin Lakes.
- Installation of 885 linear feet of 24" and 180 linear feet of 18" storm sewer along the Belden Avenue, from west of Yale Avenue, discharging into Twin Lakes.

Project Components	Comments	Engineer's Estimate of Probable Cost
• 8.7 acre-feet of above-ground storage • Re-grade existing roadside ditch • 3,420 linear feet of storm sewer	• One new storage basin is located within the existing park surrounding Twin Lakes	$3.31 million

Table 8-1 Twin Lakes Recommended Project Summary

CHAPTER 9 ODEUM

9.1 EXISTING CONDITIONS

The Odeum is located on the east side of Villa Avenue just north of Armitage Avenue, as shown in Figure 9-1. This area is located within the regulatory floodplain of Salt Creek.

Figure 9-1 Odeum

The drainage area tributary to the Odeum is approximately 305 acres. The general drainage pattern is from west to east towards the creek. The primary outlet for the storm system is a 21" storm sewer that flows east, ultimately discharging into Salt Creek. Flooding at this occurs when floodwater in Salt Creek exceeds the bank elevation.

9.2 PROPOSED CONDTIONS

Due to the proximity of the study area to Salt Creek, to provide a 100-year level of protection will require floodproofing of the Odeum building. The proposed improvements are shown on Exhibit 9.

Floodwall and Floodbreak

This Alternative provides a 100-year level of protection in this study area through the following drainage improvements:

- Construction of 1,300 linear feet of floodwall 3 feet in height (2 feet above the base flood elevation of Salt Creek).
- Installation of one 25' FloodBreak automatic vehicular floodgates.

Project Components	Comments	Engineer's Estimate of Probable Cost
• 1,300 linear feet of floodwall • 1 floodgate	• Does not provide protection from the entire Odeum parcel • Additional floodgates will increase cost	$1.20 million

Table 9-1 Odeum Recommended Project Summary

CHAPTER 10 MICHIGAN AVE

10.1 EXISTING CONDITIONS

The Michigan Avenue study area is bounded by Kenilworth Avenue on the north and Central Boulevard on the south. This study area is drained exclusively by combined sewers.

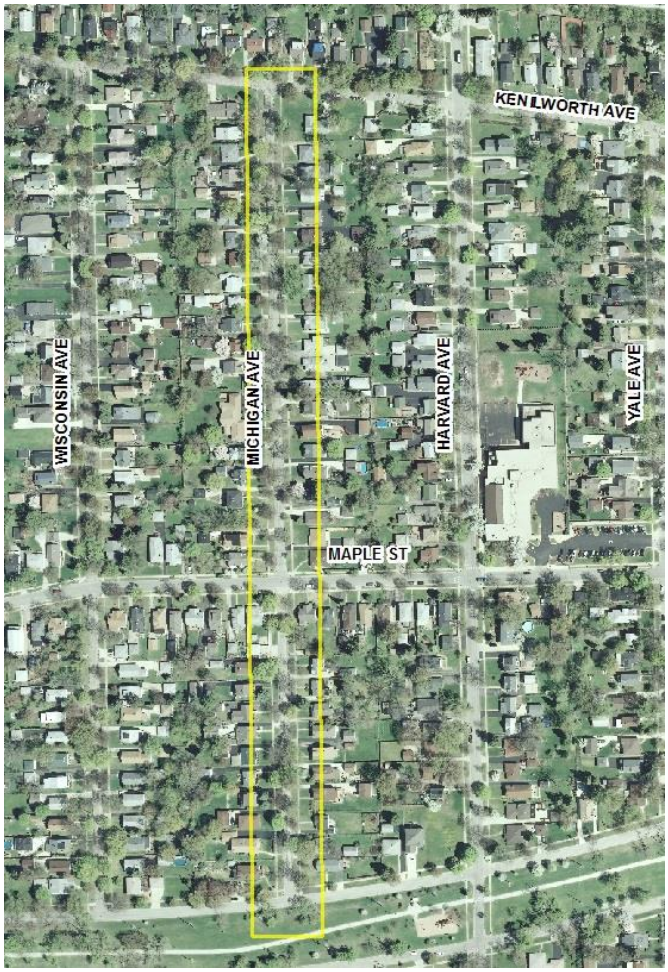

Figure 10-1 Michigan Ave

The combined sewer draining Michigan flows south to Kenilworth Avenue. The drainage area to the combined sewer line through the study area is 6.9 acres. The primary outlet for the Michigan Avenue corridor is a 15" combined sewer flowing from south to north. This combined sewer ties into a 21" combined sewer that flows east down Kenilworth Avenue. Kenilworth Avenue is served by a separate sewer line that also flows easterly.

For storm events greater than the 2-year frequency, the Michigan Avenue combined sewer surcharges and flows toward the storm sewer system on Kenilworth Avenue. Structural flooding at this study area has not been reported, but it is a CSO. Based on the XP-SWMM

computer modeling, there is approximately 26 cfs overland flow draining north along Michigan Avenue toward Kenilworth Avenue during the 100-year storm.

10.2 PROPOSED CONDTIONS

Various proposed improvements were evaluated to provide a 100-year level of flood protection for the study area. To eliminate the combined sewer overflow and reduce 100-year flooding, new storm sewers and flood storage is required. A new storm sewer will drain the Michigan Street study area and tie into the existing storm sewer on Kenilworth Avenue. To mitigate for the increased flow to the existing storm sewer, a 1.5 acre-foot detention vault is proposed in a vacant parcel on the west side of Wisconsin Avenue. A new storm sewer is proposed on Wisconsin allowing stormwater to access the proposed storage area. The existing combined sewers on both Wisconsin and Michigan north of School Street will be converted to separate sanitary sewers. The existing combined sewer on Wisconsin south of Park Boulevard will be converted to a separate storm sewer and flow north into the proposed storage basin. New sanitary sewer is proposed on Wisconsin where the combined sewers are being converted to storm sewers. The proposed improvements are shown on Exhibit 10.

New Storm Sewer, Relief Sewer & New Flood Storage

This Alternative, as shown on Exhibit 10, eliminates an existing combined sewer overflow and reduces flooding for the 100-year storm in this study area through the following drainage improvements:

- Provide 1.5 acre-feet of storage volume in and underground detention vault in the open space located in the rear yards of the homes located at 210 and 214 South Wisconsin and the open space between 210 South Wisconsin and 202 South Wisconsin.
- Installation of 423 linear feet of 24" diameter storm sewer, 321 linear feet of 36" diameter storm sewer, and 1,623 linear feet of 42" diameter storm sewer on Wisconsin Avenue, Kenilworth Avenue, and Michigan Avenue.
- Convert the existing combined sewers on Wisconsin Avenue, south of School Street to storm sewers and install new sanitary sewer along the same route.

Project Components	Comments	Engineer's Estimate of Probable Cost
• 1.5 acre-feet of underground storage • 2,367 linear feet of storm sewer • Conversion of 700 linear feet of combined sewer to storm sewer	• Eliminates existing CSO on Michigan Avenue • Reduces overland flow for the 100-year storm • Separates 19.5 acres of combined sewer drainage area	$3.86 million

Table 10-1 Michigan Ave Recommended Project Summary

CHAPTER 11 RIORDAN ROAD

11.1 EXISTING CONDITIONS

The Riordan Road study area is located at the north of Roosevelt Road between Villa Avenue and Illinois Route 83, as shown on Figure 11-1. The tributary area to this study area measures approximately 135 acres.

Figure 11-1 Riordan Rd

This study area is located within a separate sewer area. The area generally drains from west to east towards Salt Creek via storm sewers and open channels. Most of the homes in this area have a roadside ditch in the front yard with a driveway culvert with a 25-year level of protection. Primary causes of flooding in this study area are due to the minimal capacity provided by the existing conveyance system.

11.2 PROPOSED CONDTIONS

After the April 2013 storm event, the Village performed maintenance in the swale that is located east of the intersection of Monterey Avenue and Riordan Road, which removed debris

that had collected in the open channel. The proposed improvements include new flood storage and storm sewers:

New Storm Sewer & New Flood Storage

This Alternative, is shown on Exhibit 11, the proposed improvements eliminates the street ponding along Riordan Road and contains the ponding within the roadside ditches through the following drainage improvements:

- Provide 0.5 acre-feet of storage volume in existing park located at the intersection of Riordan Road and Monterey Avenue.
- Installation of 35 linear feet of 18" storm sewer to tie the existing roadside ditch into the proposed basin.
- Installation of 350 linear feet of 24" storm sewer along Riordan Road tying into the proposed basin.

Project Components	Comments	Engineer's Estimate of Probable Cost
• 0.5 acre-feet of above-ground storage • 385 linear feet of storm sewer	• Storage basin located within existing park • Basin will outlet to an existing swale	$439,000

Table 11-1 Riordan Rd Recommended Project Summary

CHAPTER 12 CHARLES AVENUE

12.1 EXISTING CONDITIONS

The Charles Avenue study area is located west of Summit Avenue, north of St. Charles Road, and south of Elm Street, as shown on Figure 12-1. This street is primarily served by a combined sewer that is tributary to the combined sewer flowing easterly along St. Charles Road.

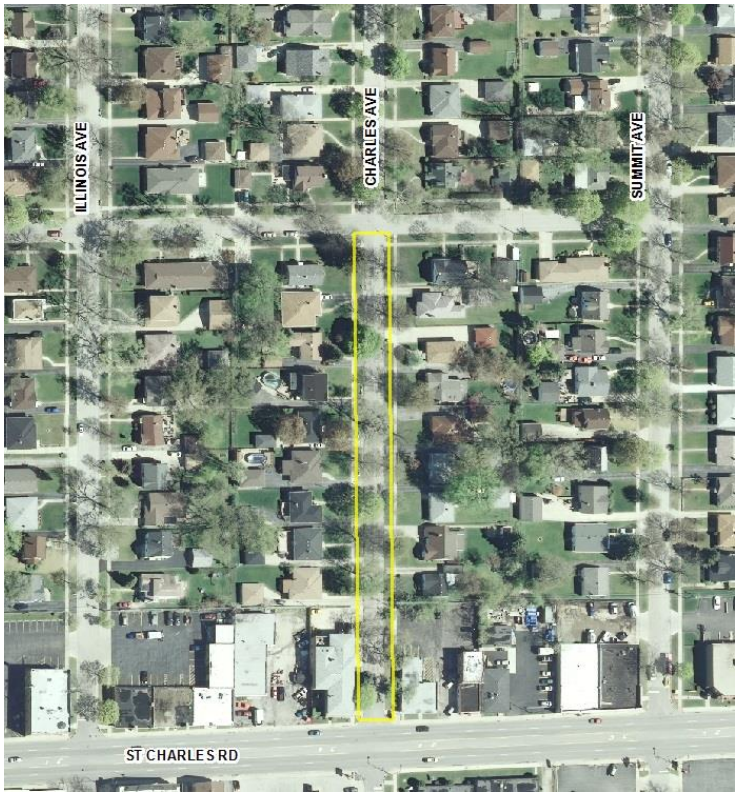

Figure 12-1 Charles Ave

The general drainage pattern is from west to east towards Summit Avenue, and towards the intersection of Charles Avenue and Elm Street. The primary outlet for the storm system is a 39" sewer that flows east along Elm Street and then south along Summit Avenue. There is not defined overland flow path for this study area, which has a 25-year level of protection. For storm events greater than the 25-year, overland flow from the upstream storm sewer system enters the combined sewer causing it to surcharge and pond in the street up to 1.3 feet in the 100-year storm event, causing a CSO. The flooding in this area is due to small sewers and the lack of overland flow path.

12.2 PROPOSED CONDTIONS

Because this is a combined sewer area, any surcharge is considered a CSO. To eliminate the CSO within the study area, separation of the combined sewer is proposed in addition to proposed storage.

New Storm Sewer & New Flood Storage

This Alternative is shown on Exhibit 14. The proposed improvements do not eliminate the street ponding at the intersection of Elm Street and Charles Avenue, but the do provide significant flood reduction and sewer separation in this area through the following drainage improvements:

- Provide 0.9 acre-feet of storage volume an underground vault at the parcel located at 114 E St. Charles Road, that will outlet to the existing St. Charles Road storm sewer.
- Installation of 620 linear feet of 48" storm sewer to separate the existing combined sewer and tie into the proposed storage vault.
- Installation of 300 linear feet of 24" storm sewer along Charles Avenue, separating the existing storm sewer.

Project Components	Comments	Engineer's Estimate of Probable Cost
• 0.9 acre-feet of underground storage • 920 linear feet of storm sewer	• Separates the existing combined sewer	$1.69 million

Table 12-1 Charles Ave Recommended Project Summary

CHAPTER 13 ROTARY PARK

13.1 EXISTING CONDITIONS

Rotary Park is located between Salt Creek and Monterey Avenue north of Wildwood Avenue, as shown on figure 13-1. The recreational park is located entirely within the floodplain of Salt Creek, with the lowest contour in Rotary Park being approximately 3 feet below the 100-year flood elevation of Salt Creek.

Figure 13-1 Rotary Park

The general drainage pattern is from west to east towards Salt Creek. There are approximately 47 acres of direct tributary area to Rotary Park, including the area that is tributary to the Ovaltine Court stormwater facility. According to the Village, the area surrounding Rotary Park was inundated by floodwaters for approximately 4 days following the storm event. There are two storm sewers that enter the northwest corner of the site, that combine and discharge to Salt Creek. There is also one outlet from the low point in Rotary Park that has a direct connection to Salt Creek.

13.2 PROPOSED CONDTIONS

Because of the site's proximity to Salt Creek and the hydraulic connections to Salt Creek, drainage improvements in this area is very unlikely to provide any significant flood reduction. Any disconnection from Salt Creek will require compensatory storage. New storage must be created by excavating the existing ground. There is a proposed development which includes the possible expansion of the existing Community Recreation Building at 320 East Wildwood Avenue (Lion's Park), in addition to another recreation facility. A detention analysis was performed to determine the required storage volume associated with these improvements. Assuming that the entire footprint will be impervious, 0.4 acre-feet of storage volume is required, with an allowable release rate of 0.1 cfs/acre of disturbed area. Additionally, Post-Construction Best Management Practices (PCBMPs) will also be required on-site. If stormwater storage is not able to be provided at any of the three locations listed below, fee in lieu of detention is a potential alternative. The three identified storage locations to provide off-site stormwater detention within the study area include:

- Rotary Park
- Ovaltine Court Stormwater Facility
- Open Parcel South of 53 S Euclid Ave

Rotary Park

Rotary Park is located approximately 0.5 miles east of the existing Lion's Park, where the improvements are proposed. This park is located almost entirely within the 100-year floodplain of Salt Creek. The existing park has a parking lot, gazebo and existing structure located along Wildwood Avenue. Based on the topography, there is an area of high ground that can be excavated and new storage can be provided. Approximately 0.9 acre-feet of storage volume is gained by excavating this area to the existing park ground elevation. If a parking lot is replaced at this location, it will be approximately 1 foot below the existing flood elevation of Salt Creek. Cost for this storage is $288,500. Due to the proximity to Lion's Park, this is not a location where detention storage volume can directly be provided.

Ovaltine Court Stormwater Facility

The existing stormwater facility along Ovaltine Court, south of Wildwood Avenue is located approximately 0.3 miles east of the existing Lion's Park. This storage facility has approximately 5 acre-feet of existing storage volume. The portion of the pond, adjacent to Wildwood Avenue has a landscape embankment that can be modified to a retaining wall, gaining approximately 0.5 acre-feet of additional storage volume. Cost for this storage is $342,000. Due to the proximity to Lion's Park, this is not a location where detention storage volume can directly be provided.

Open Parcel South of 53 S Euclid Ave

This parcel is located southwest of the existing Lion's Park. This is the only location that detention storage volume can be provided for the site due to its proximity to the proposed improvements. This parcel is north of an existing low point along Wildwood Avenue.

Stormwater storage at this location will need to be provided below the existing ground, but will require a backflow preventer to prevent the storage basin from being filled with stormwater from the sewers prior to being utilized for detention storage. Excavation of this basin, while providing a gravity outlet to the existing storm sewer system, provides approximately 0.6 acre-feet of additional storage volume. The cost for this storage volume is $214,500. The existing storm sewer system travels west along Wildwood Avenue and north along Summit Avenue, prior to tying into the St. Charles Road storm sewer system. Additional storage volume can be provided if Wildwood Avenue, east of Euclid Avenue, is vacated.

The various projects are summarized in Table 13-1 and are shown on Exhibit 15.

Storage Location	Project Components	Comments	Engineer's Estimate of Probable Cost
Rotary Park	• 0.9 acre-feet of storage volume	• Removes existing park facilities • Located 0.5 miles east of Lion's Park proposed improvements	$288,000
Ovaltine Court Stormwater Facility	• 0.5 acre-feet of storage volume	• Requires retaining wall along northern embankment • Located 0.3 miles east of Lion's Park proposed improvements	$342,000
Open Parcel South of 53 S Euclid Ave	• 0.6 acre-feet of storage volume • 70 linear feet of 12" storm sewer • Backflow Preventer	• Does not solve existing street ponding along Wildwood Avenue • Detention storage for proposed improvements can be provided	$215,000

Table 13-1 Rotary Park Recommended Project Summary

CHAPTER 14 BRER RABBIT MOTEL

14.1 EXISTING CONDITIONS

Brer Rabbit Motel is located south of North Avenue and east of Ardmore Avenue, as shown in Figure 14-1. This study area is located within a separate sewer area with the ultimate outlet being the North Avenue storm sewer.

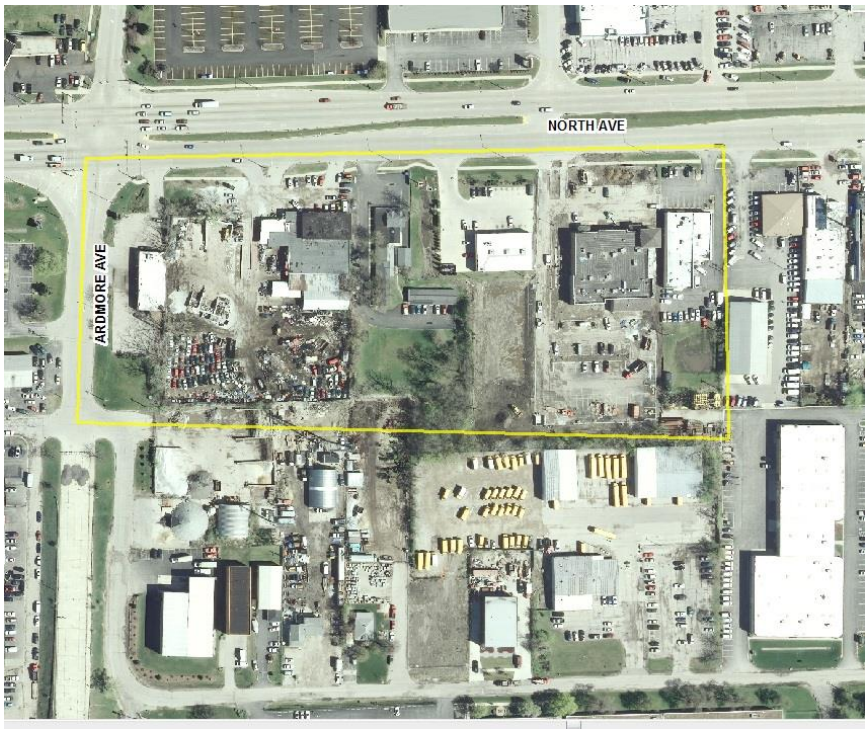

Figure 14-1 Brer Rabbit Motel

The general drainage pattern is from south to north towards North Avenue. There is approximately 10 acres of area directly tributary to the outlet for this study area. There is one existing depressional storage area located immediately south of Brer Rabbit Motel, a detention storage facility associated with the AutoZone Development that is located east of the Brer Rabbit Motel and a detention pond located southeast of the Brer Rabbit Motel that is hydraulically connected to the AutoZone basin. This location experiences repetitive flooding and the eastbound lanes of North Avenue between Ardmore and Addison are often closed. It was determined that the flooding is generally caused by the lack of capacity in the lateral storm sewers that convey flow towards the North Avenue mainline in addition to the lack of an outlet for the low lying areas within the subject parcel. Based on the XP-SWMM modeling results, this area has less than a 2-year level of protection and there is approximately 1.7 feet of ponding on the Brer Rabbit Motel parcel.

14.2 PROPOSED CONDTIONS

To reduce the 100-year flooding within the Brer Rabbit Motel parcel, new storm sewers and flood storage is required. There are three parcels located west of the Brer Rabbit Motel that are currently used for site storage for the existing recycling facility. Soil testing is recommended for this site to determine its viability as future stormwater storage facility. A new storage facility will be excavated at this location and will outlet to an existing lateral pipe that connects to the North Avenue trunk sewer. The existing Brer Rabbit Motel depressional area will be connected to the new storage facility via a 24" pipe and the storm sewer that connects to the Martin's Big and Tall outlet pipe will also be connected to the proposed storage facility to reduce the overland flow over Ardmore Avenue, resulting in reducing the ponding at North Avenue and Ardmore Avenue. The proposed improvements are shown on Exhibit 16.

New Storm Sewer, Relief Sewer & New Flood Storage

This Alternative, as shown on Exhibit 16, reduces flooding for the 100-year storm in this study area through the following drainage improvements:

- Provide 2.8 acre-feet of storage volume in an above-ground storage basin located west of Brer Rabbit Motel.
- Installation of 210 linear feet of 24" diameter storm sewer connecting the existing Brer Rabbit Motel depressional storage area to the proposed basin.
- Installation of 215 linear feet of 24" diameter storm sewer connecting the existing outlet at the southwest corner of North Avenue and Ardmore Avenue to the proposed storage facility.
- Installation of 60 linear feet of 12" diameter storm sewer connecting the existing outlet at the southeast corner of North Avenue and Ardmore Avenue to the proposed storage facility.
- Installation of 95 linear feet of 12" diameter storm sewer with an 8" restrictor connecting the proposed basin to outlet to an existing structure that discharges to the North Avenue storm sewer.

Project Components	Comments	Engineer's Estimate of Probable Cost
• 2.8 acre-feet of above-ground storage • 580 linear feet of storm sewer	• Requires property acquisition • Soil conditions of existing property for proposed basin unknown	$1.71 million[1]

[1] *Excavation is assumed to be special waste due to the existing site use.*

Table 14-1 Brer Rabbit Motel Recommended Project Summary

CHAPTER 15 SUMMARY

15.1 SUMMARY

A comprehensive flood study of the portion of the Village that drains into Salt Creek was completed by CBBEL. Based upon a review of the available flood data, it was determined that 13 areas of the Village should be examined in more detail to develop alternatives that will reduce the frequency and duration of flooding within these areas. Although 13 areas were analyzed as part of this study, there are other areas that were identified where additional improvements/sewer separation projects could be implemented. A more detailed analysis of these additional areas would be necessary to determine the required drainage improvements to reduce the risk of flooding in these other areas.

The 13 study areas discussed in the previous chapters were evaluated using the XP-SWMM model to determine the existing level of protection for each area that experience flooding problems. For the thirteen areas analyzed in this study, the existing level of protection ranges from less than a 2 year through the 25 year return intervals.

To increase the level of flood protection in these thirteen flood-prone areas, concept-level drainage improvements were analyzed to determine the potential flood reduction benefits. The primary focus was to provide a 100-year level of protection within each of the study areas. These drainage improvements consisted of the following: upsizing of existing storm sewers, new storm sewers, creation of flood storage in open space, and underground detention storage. Because many of the study areas include upsizing the existing storm sewers and the separation of the combined sewers, flood storage is required to mitigate for increased conveyance; however, due to the limited open space within the Village, many of these options will require parcel acquisition where open space is currently not available.

The conceptual cost estimates for the proposed improvements for the study areas range from $215,000 to $18.82 million.

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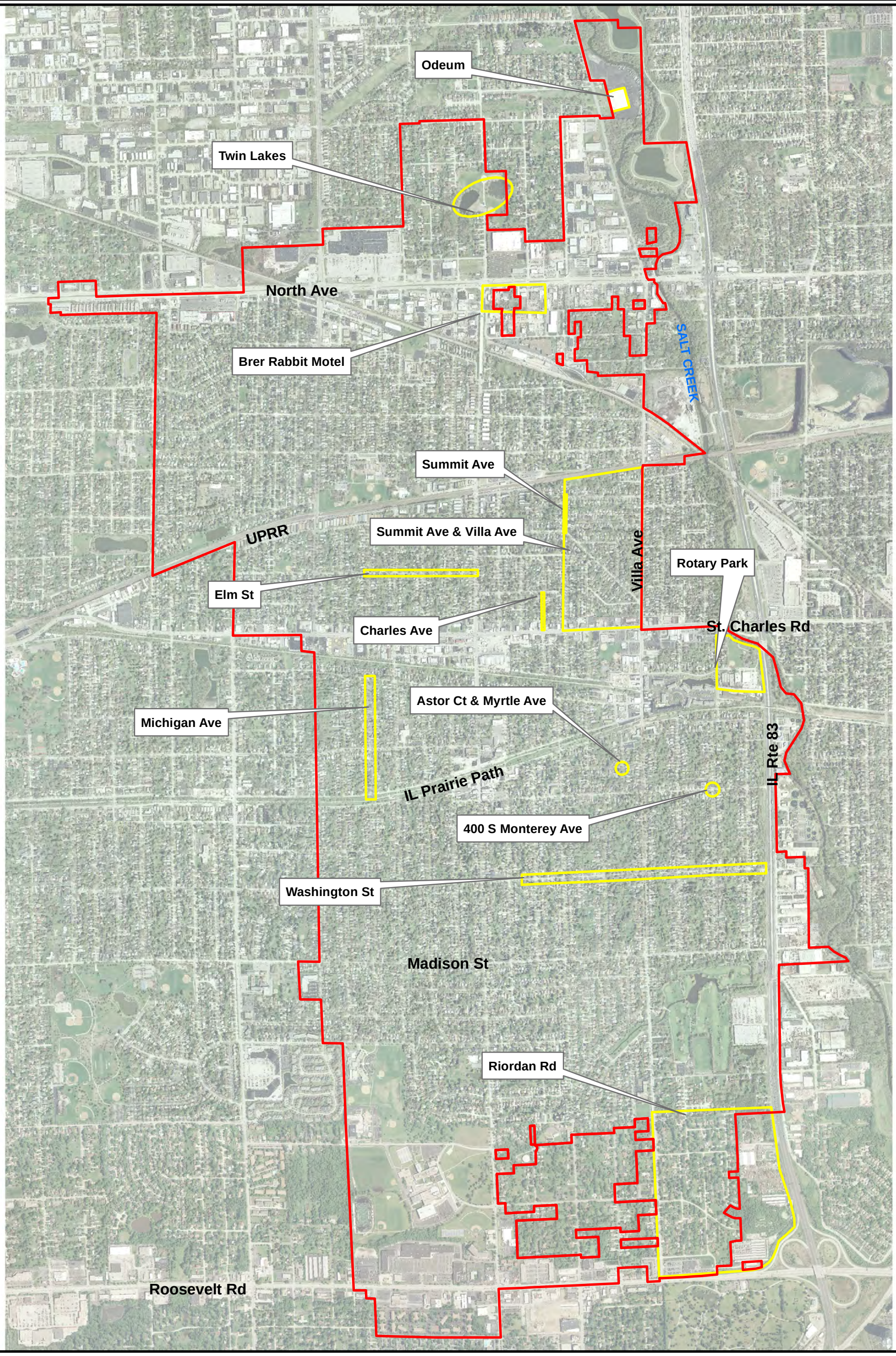


DSGN.	JMG	**CHKD.**	GLR

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, IL 60018
(847) 823-0500 / FAX (847) 823-0520

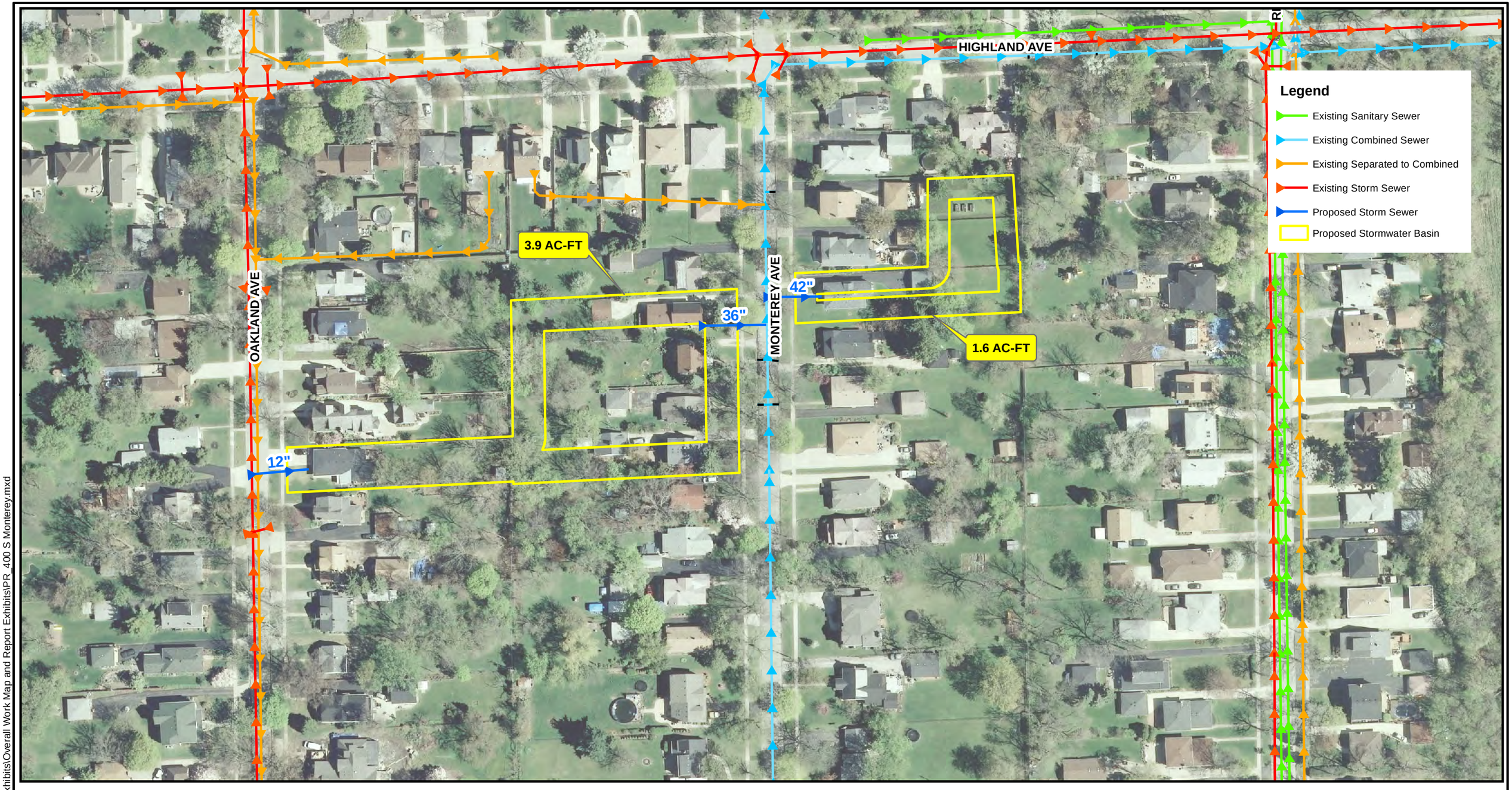
CLIENT
Village of Villa Park

PROJECT NO.
14-0092

TITLE
Overall Study Area

DATE
03/27/15

EXHIBIT 1



APPROXIMATE SCALE: 1" = 200'

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Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, IL 60018
(847) 823-0500 / FAX (847) 823-0520

CLIENT	Village of Villa Park
PROJECT NO.	14-0092
TITLE	Proposed 400 S Monterey Avenue Improvements
DATE	3-31-15
	Exhibit 2

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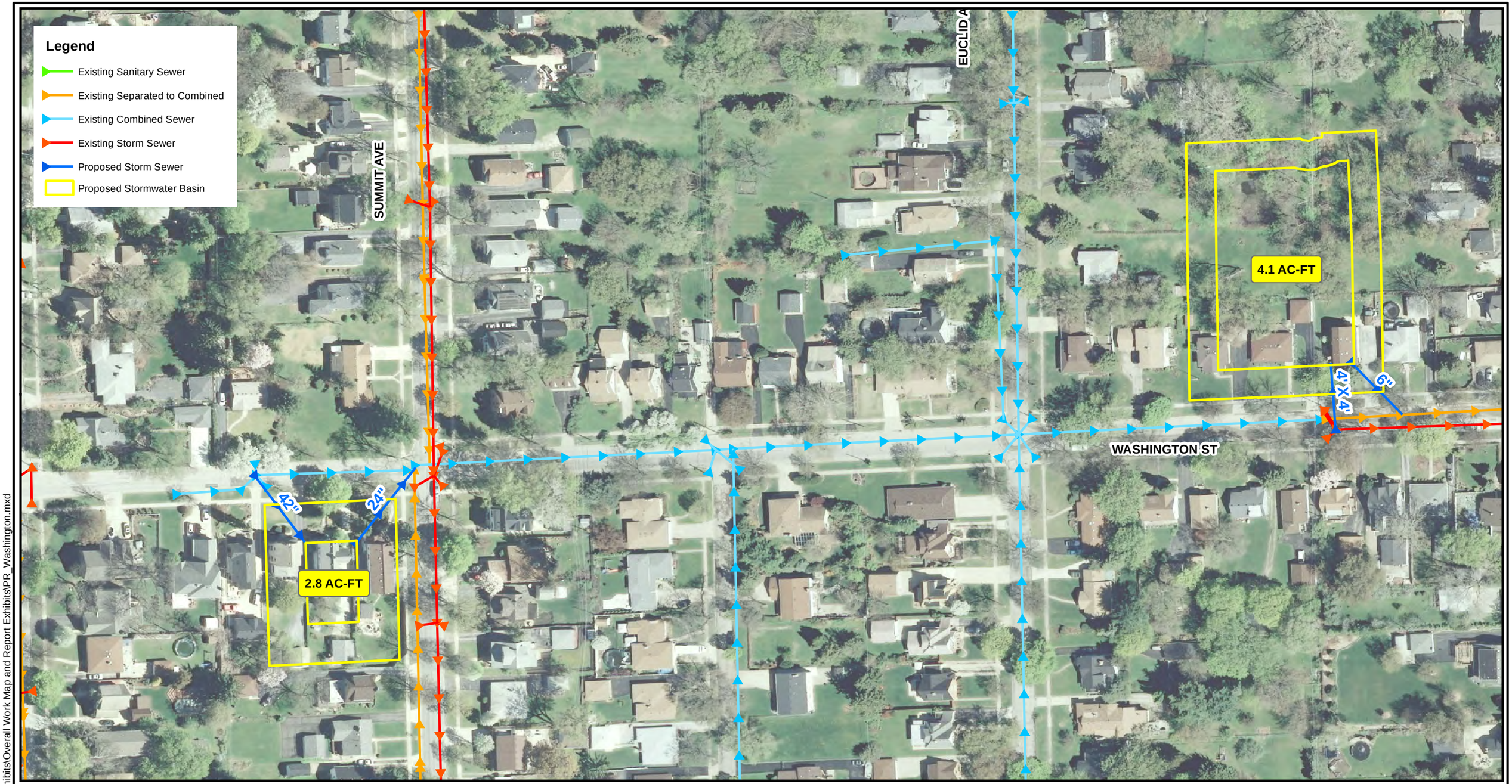

APPROXIMATE SCALE: 1" = 200'

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Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, IL 60018
(847) 823-0500 / FAX (847) 823-0520

CLIENT	Village of Villa Park
PROJECT NO.	14-0092
TITLE	Proposed Washington Avenue Improvements
DATE	3-31-15
	Exhibit 3

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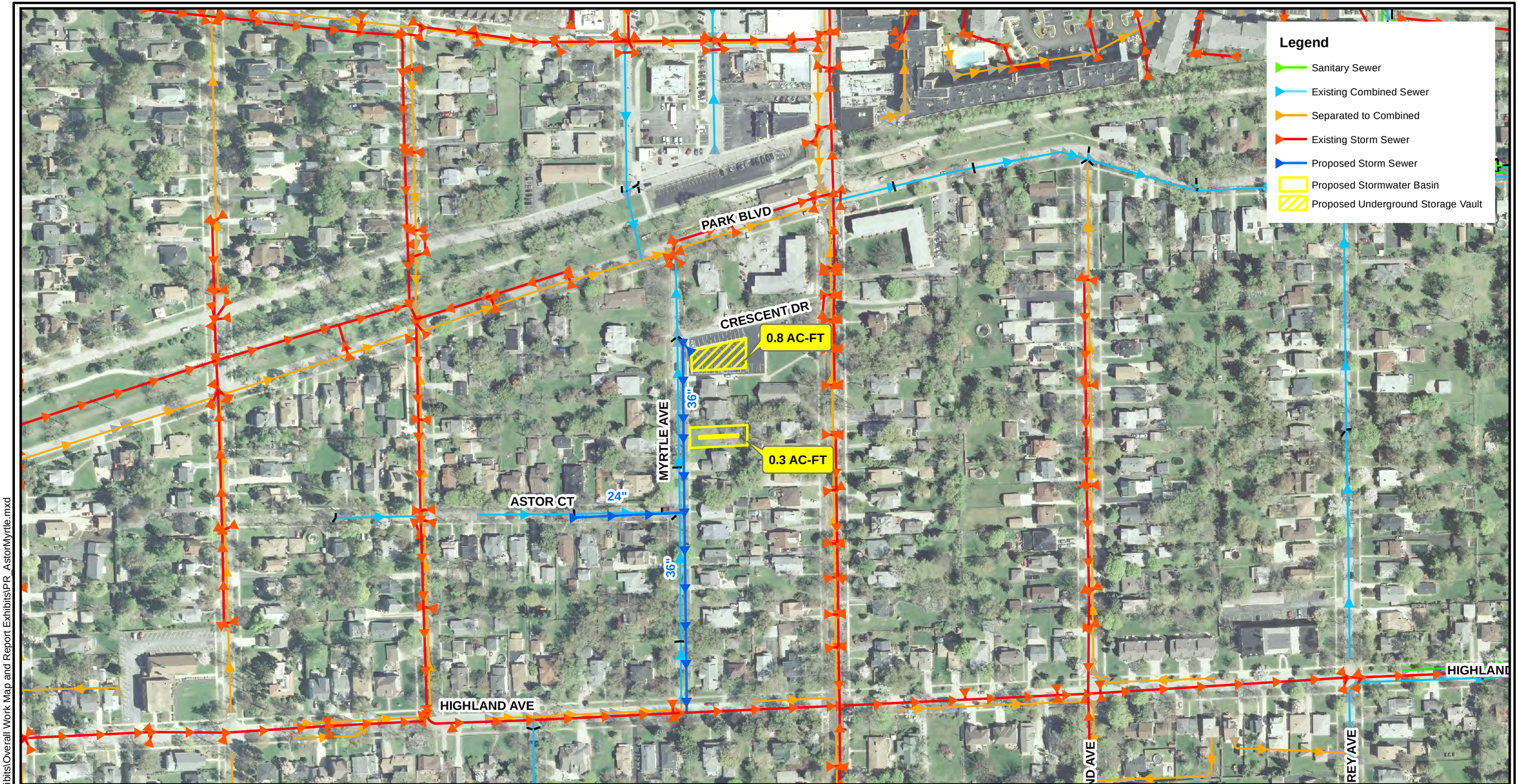

APPROXIMATE SCALE: 1" = 200'

DSGN.	JMG	CHKD.	GLR

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, IL 60018
(847) 823-0500 / FAX (847) 823-0520

CLIENT	Village of Villa Park
PROJECT NO.	14-0092
TITLE	Proposed Astor Court & Myrtle Avenue Improvements
DATE	3-31-15
	Exhibit 4

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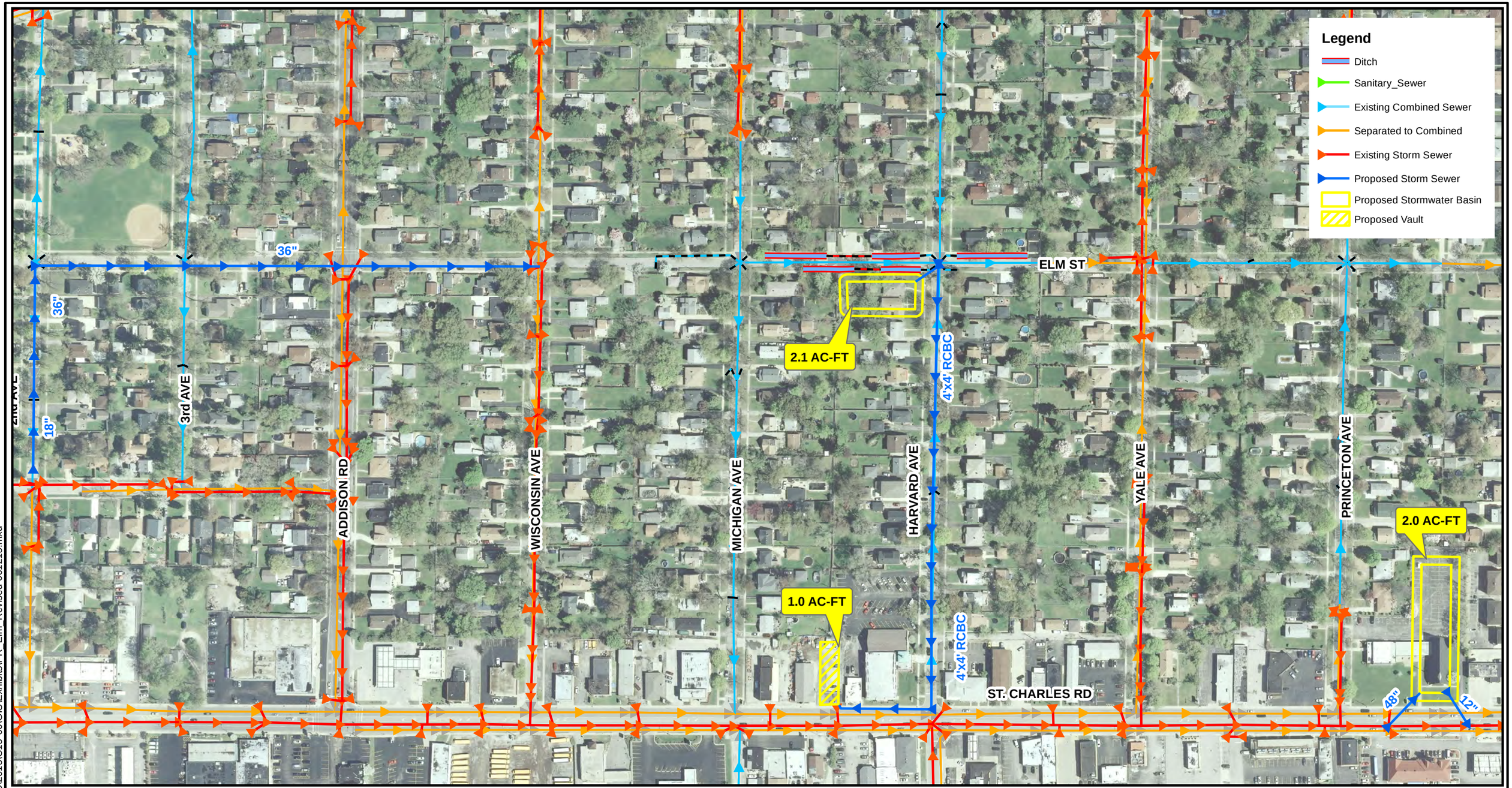


APPROXIMATE SCALE: 1" = 200'

DSGN.	JMG	CHKD.	GLR

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, IL 60018
(847) 823-0500 / FAX (847) 823-0520

CLIENT Village of Villa Park

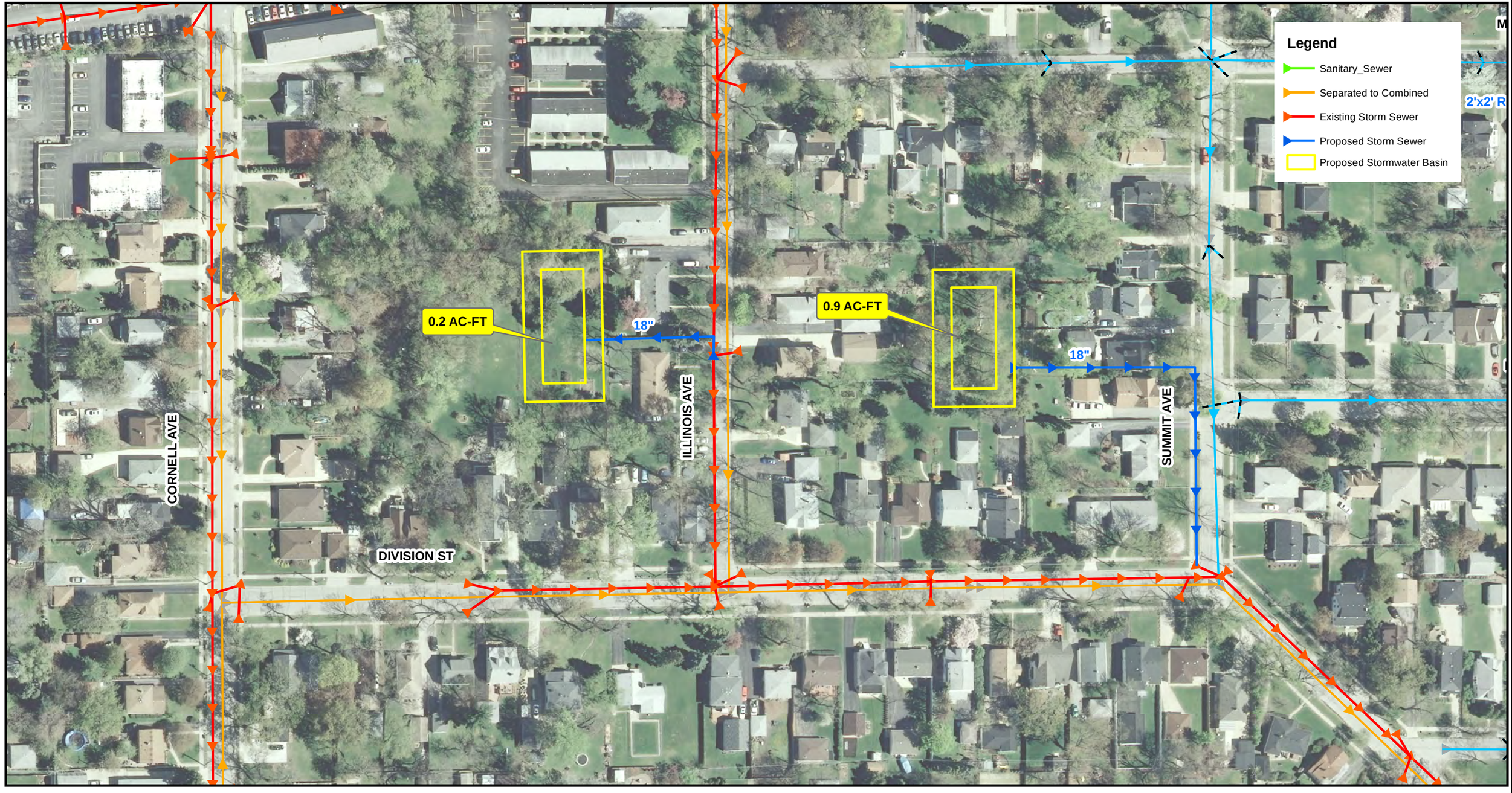
PROJECT NO. 14-0092

TITLE Proposed Elm St Improvements

DATE 6-1-15

Exhibit 5

Path: N:\Shorewood\070001\070001C\2015\C15-06\GIS\Exhibits\PR_Elm_Revised 061215.mxd



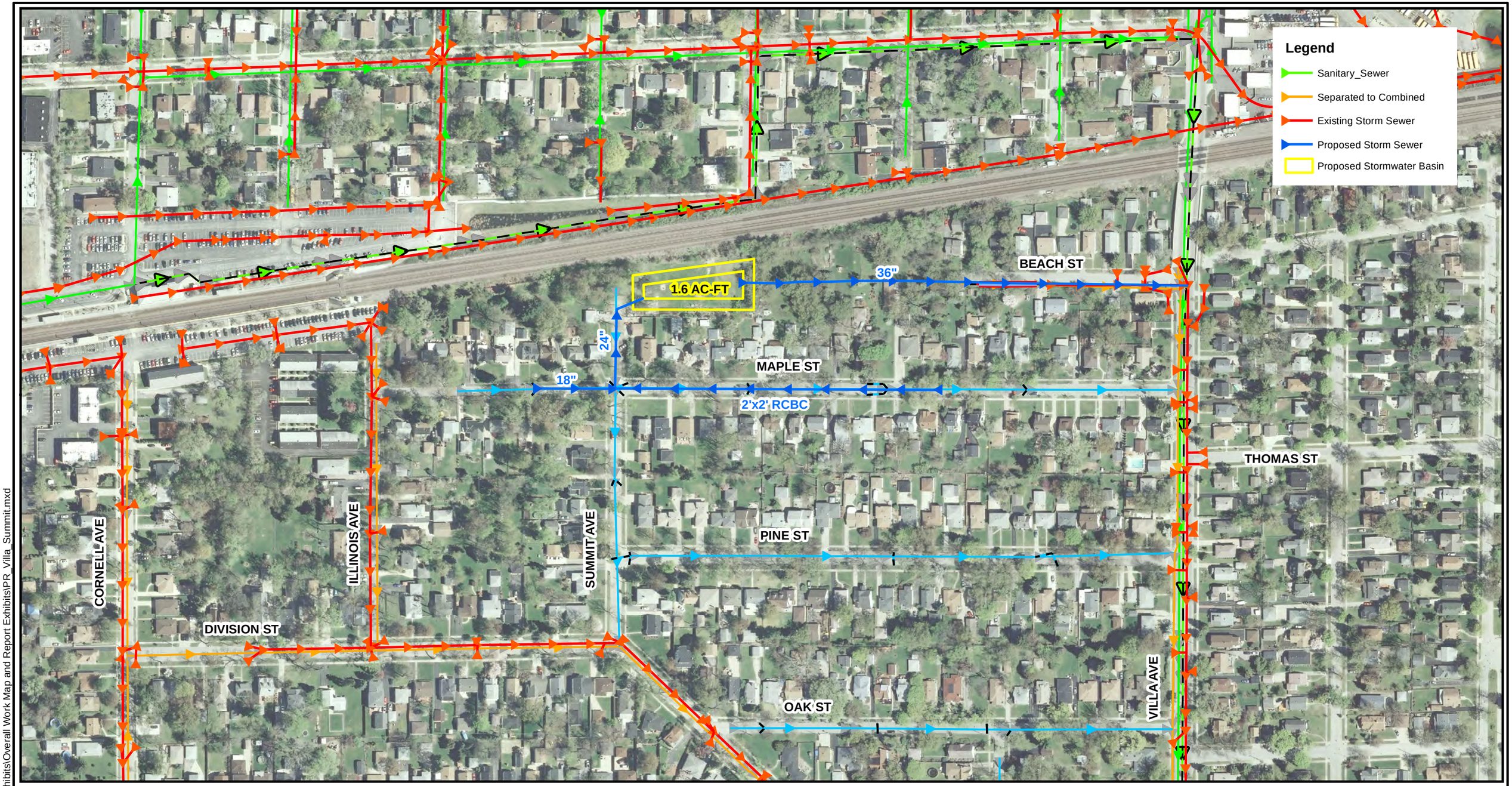
APPROXIMATE SCALE: 1" = 100'

DSGN.	JMG	CHKD.	GLR

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, IL 60018
(847) 823-0500 / FAX (847) 823-0520

CLIENT	Village of Villa Park
PROJECT NO.	14-0092
TITLE	Proposed Summit Avenue Improvements
DATE	3-31-15
	Exhibit 6

Path: N:\VILLAPARK\140092\GIS\Exhibits\Overall Work Map and Report Exhibits\PR_Summit.mxd



APPROXIMATE SCALE: 1" = 200'

DSGN.	JMG	CHKD.	GLR

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, IL 60018
(847) 823-0500 / FAX (847) 823-0520

CLIENT Village of Villa Park

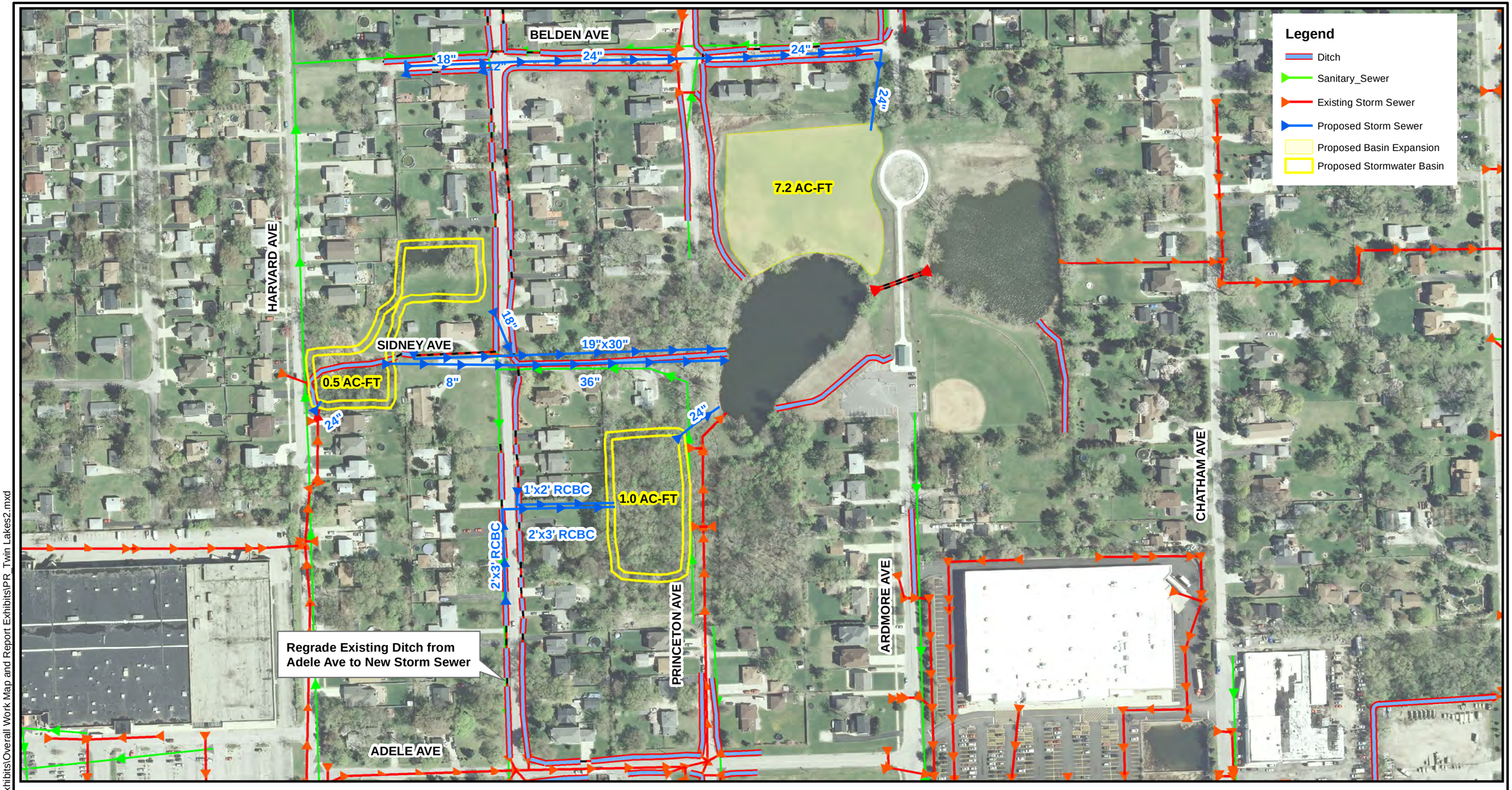
PROJECT NO. 14-0092

TITLE Proposed Summit Avenue and Villa Avenue Improvements

DATE 3-31-15

Exhibit 7

Path: N:\VILLAPARK\140092\GIS\Exhibits\Overall Work Map and Report Exhibits\PR_Villa_Summit.mxd



APPROXIMATE SCALE: 1" = 200'

DSGN.	JMG	CHKD.	GLR

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, IL 60018
(847) 823-0500 / FAX (847) 823-0520

CLIENT	Village of Villa Park
PROJECT NO.	14-0092
TITLE	Proposed Twin Lakes Improvements
DATE	3-31-15
	Exhibit 8

Path: N:\VILLAPARK\140092\GIS\Exhibits\Overall Work Map and Report Exhibits\PR_Twin Lakes2.mxd

APPROXIMATE SCALE: 1" = 300'

DSGN.	JMG	CHKD.	GLR

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, IL 60018
(847) 823-0500 / FAX (847) 823-0520

CLIENT	Village of Villa Park
PROJECT NO.	14-0092
TITLE	Proposed Odeum Improvements
DATE	3-31-15
	Exhibit 9

Path: N:\VILLAPARK\140092\GIS\Exhibits\Overall Work Map and Report Exhibits\PR_Odeum.mxd

KENILWORTH AVE

42"

KENILWORTH AVE

42"

36"

1.5 AC-FT

WISCONSIN AVE

42"

MICHIGAN AVE

HARVARD AVE

YALE AVE

24"

MAPLE ST

DIVISION ST

WOODROW ST

Legend

- Separated to Combined
- Existing Combined Sewer
- Existing Storm Sewer
- Area 9 Proposed Storm Sewer
- Area 9 Proposed Sanitary Sewer

DSGN.	MJB	CHKD.	GLR

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, IL 60018
(847) 823-0500 / FAX (847) 823-0520

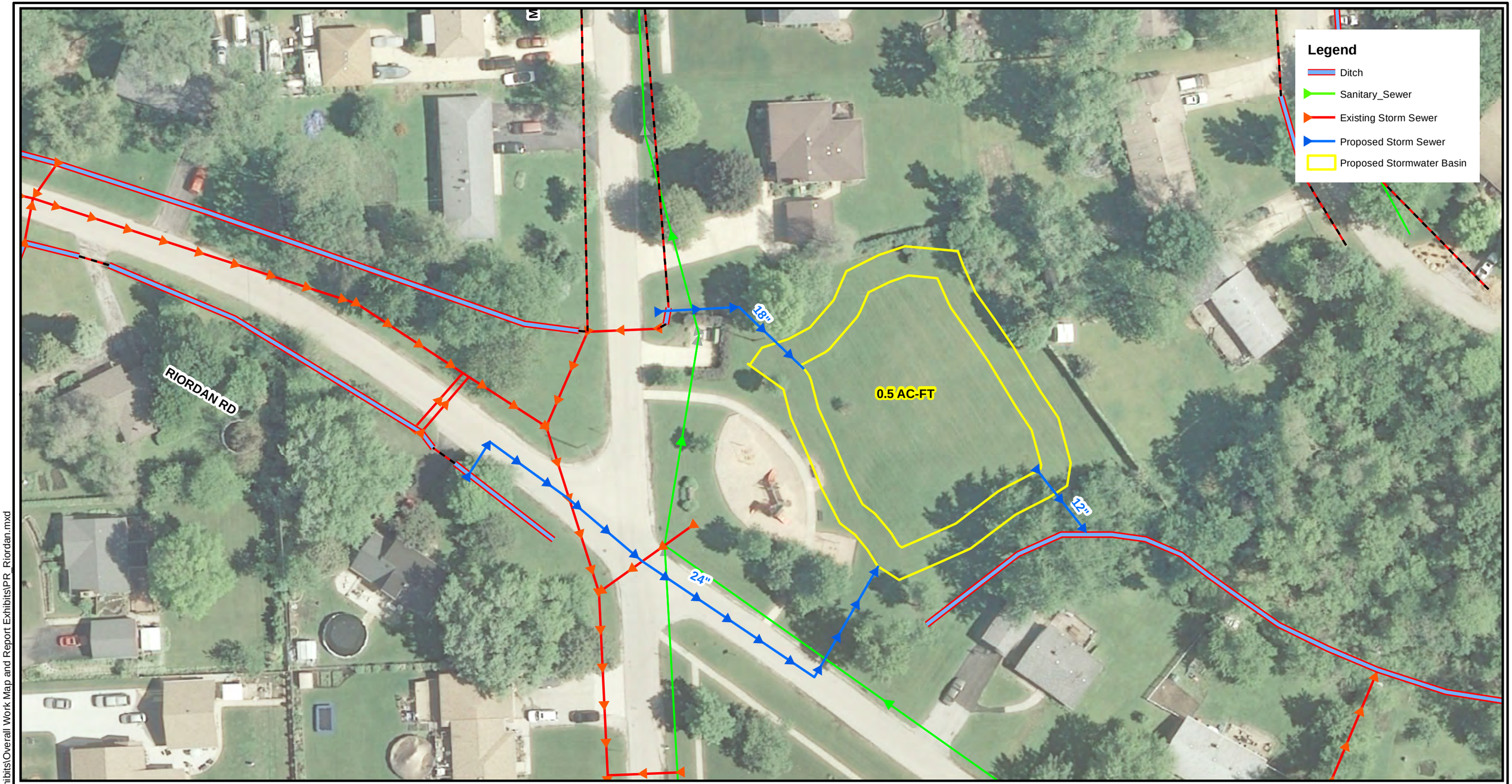
CLIENT
Village of Villa Park

PROJECT NO.
14-0092

TITLE
Proposed Michigan Avenue Improvements

DATE
03/31/15

EXHIBIT 10



APPROXIMATE SCALE: 1" = 50'

DSGN.	JMG	CHKD.	GLR

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, IL 60018
(847) 823-0500 / FAX (847) 823-0520

CLIENT Village of Villa Park

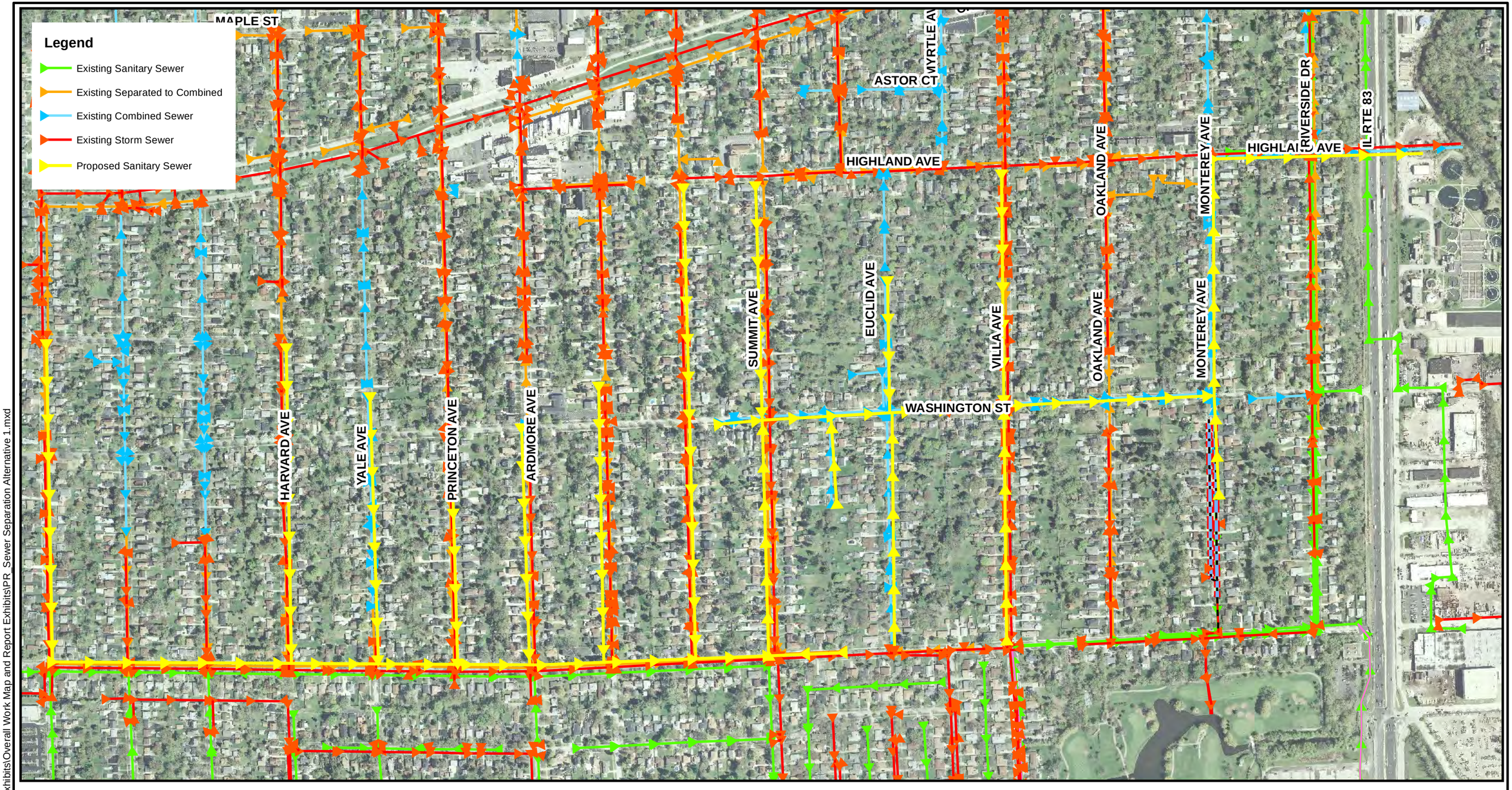
PROJECT NO. 14-0092

TITLE Proposed Riordan Road Improvements

DATE 3-31-15

Exhibit 11

Path: N:\VILLAPARK\140092\GIS\Exhibits\Overall Work Map and Report Exhibits\PR_Riordan.mxd



APPROXIMATE SCALE: 1" = 200'

DSGN.	JMG	CHKD.	GLR

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, IL 60018
(847) 823-0500 / FAX (847) 823-0520

CLIENT Village of Villa Park

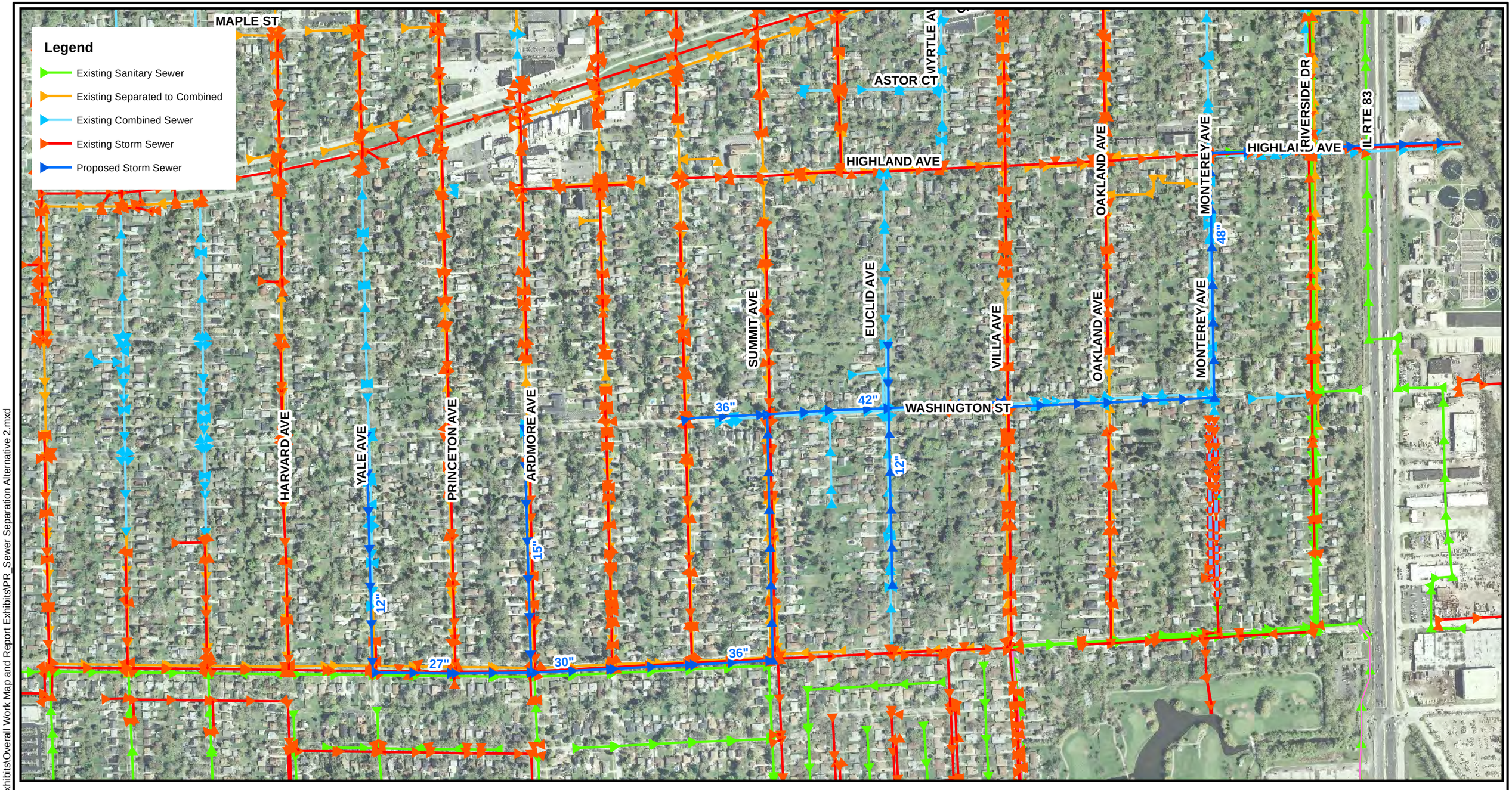
PROJECT NO. 14-0092

TITLE Proposed Sewer Separation Alternative 1

DATE 3-31-15

Exhibit 12

Path: N:\VILLAPARK\140092\GIS\Exhibits\Overall Work Map and Report Exhibits\PR_Sewer Separation Alternative 1.mxd



Path: N:\VILLAPARK\140092\GIS\Exhibits\Overall Work Map and Report Exhibits\PR_Sewer Separation Alternative 2.mxd

APPROXIMATE SCALE: 1" = 200'

DSGN.	JMG	CHKD.	GLR

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, IL 60018
(847) 823-0500 / FAX (847) 823-0520

CLIENT	Village of Villa Park
PROJECT NO.	14-0092
TITLE	Proposed Sewer Separation Alternative 2
DATE	3-31-15
	Exhibit 13

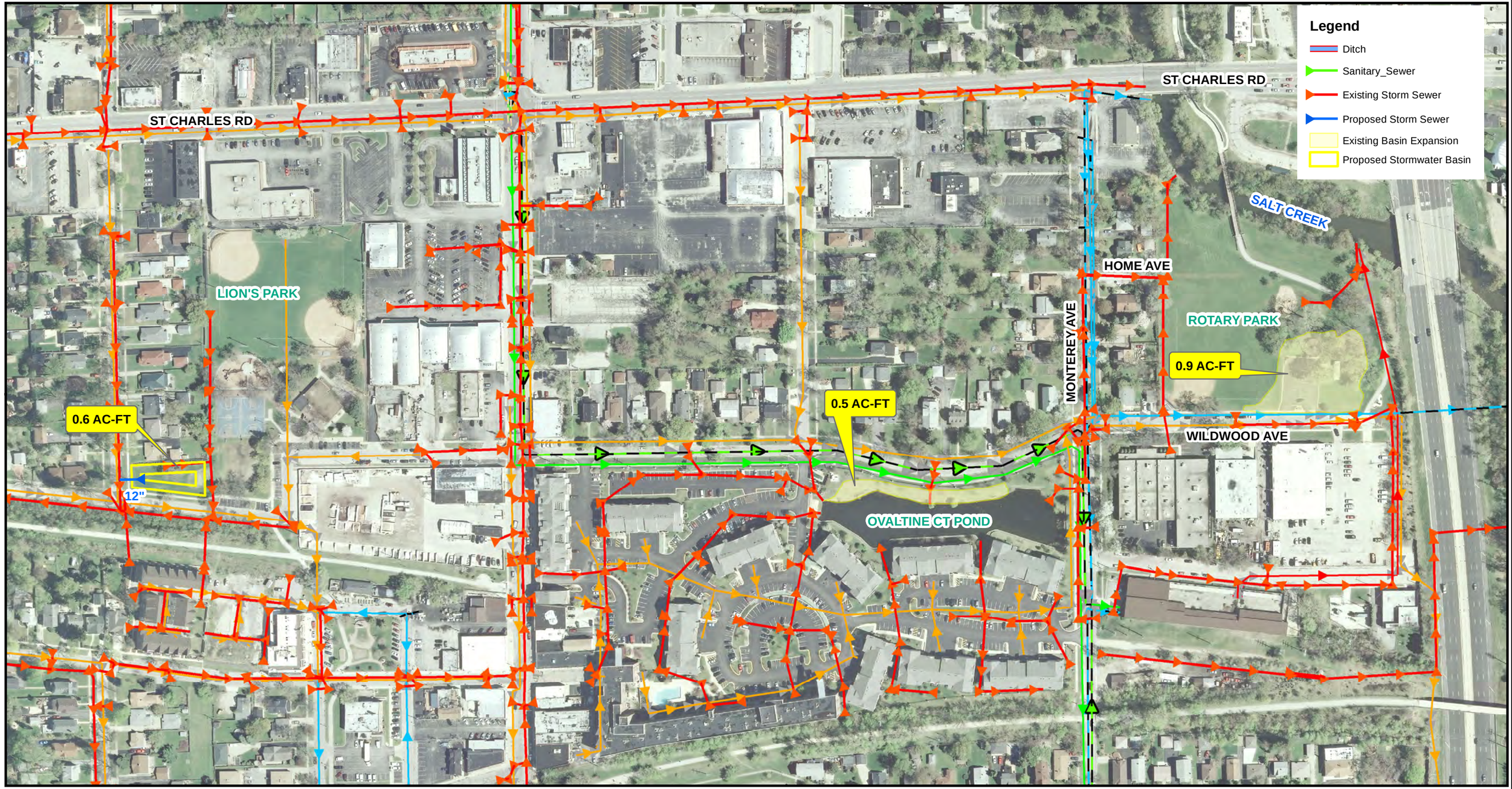
APPROXIMATE SCALE: 1" = 150'

DSGN.	JMG	CHKD.	GLR

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, IL 60018
(847) 823-0500 / FAX (847) 823-0520

CLIENT	Village of Villa Park
PROJECT NO.	14-0092
TITLE	Proposed Charles Avenue Improvements
DATE	3-31-15
	Exhibit 14

Path: N:\VILLAPARK\140092\GIS\Exhibits\Overall Work Map and Report Exhibits\PR_Charles.mxd



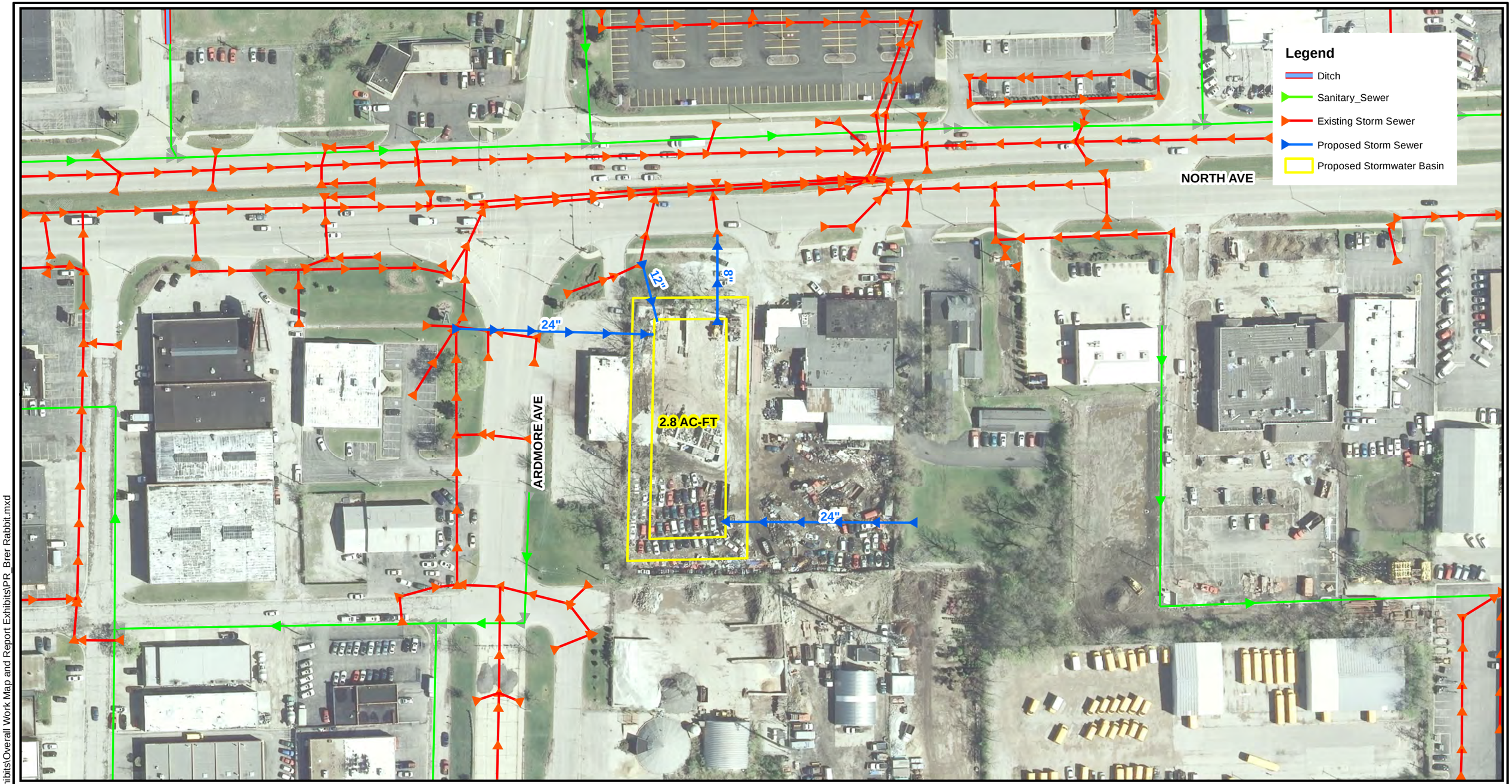
APPROXIMATE SCALE: 1" = 50'

DSGN.	JMG	CHKD.	GLR

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, IL 60018
(847) 823-0500 / FAX (847) 823-0520

CLIENT	Village of Villa Park
PROJECT NO.	14-0092
TITLE	Proposed Rotary Park Improvements
DATE	3-31-15
	Exhibit 15

Path: N:\VILLAPARK\140092\GIS\Exhibits\Overall Work Map and Report Exhibits\PR_Rotary Park.mxd



APPROXIMATE SCALE: 1" = 100'

DSGN.	JMG	CHKD.	GLR

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, IL 60018
(847) 823-0500 / FAX (847) 823-0520

CLIENT Village of Villa Park

PROJECT NO. 14-0092

TITLE Proposed Brer Rabbit Motel Improvements

DATE 3-31-15

Exhibit 16

Path: N:\VILLAPARK\140092\GIS\Exhibits\Overall Work Map and Report Exhibits\PR_Brer Rabbit.mxd

Appendix 1
Cost Estimates

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
Project Number: 14-0092
Date: December 24, 2014
Revised: March 9, 2015

Village of Villa Park, Proposed Drainage Improvements
MONTEREY

ITEMS	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
EARTH EXCAVATION	CU YD	13,750	$30.00	$412,500.00
TREE REMOVAL	ACRE	2	$10,000.00	$20,000.00
TOPSOIL STRIPPING AND PLACEMENT	SQ YD	10,000	$10.00	$100,000.00
SEEDING	SQ YD	10,000	$2.00	$20,000.00
EROSION CONTROL BLANKET	SQ YD	10,000	$4.00	$40,000.00
STORM SEWER, RCP 36"	FOOT	200	$110.00	$22,000.00
STORM SEWER, RCP 42"	FOOT	200	$150.00	$30,000.00
MANHOLES, 5' DIAMETER	EACH	4	$7,500.00	$30,000.00
36" FLARED END SECTION W/ GRATE	EACH	4	$4,000.00	$16,000.00
STONE RIPRAP W/ FILTER FABRIC	SQ YD	40	$50.00	$2,000.00
CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT	FOOT	1,000	$22.00	$22,000.00
CONCRETE SIDEWALK REMOVAL AND REPLACEMENT	SQ FT	1,000	$15.00	$15,000.00
DETECTABLE WARNINGS	SQ FT	100	$50.00	$5,000.00
DRIVEWAY REMOVAL AND REPLACEMENT	SQ YD	100	$50.00	$5,000.00
SITE DEWATERING	EACH	2	$25,000.00	$50,000.00
SILT FENCE	FOOT	2,400	$5.00	$12,000.00
FENCE REMOVAL AND REPLACEMENT	FOOT	200	$20.00	$4,000.00
HOME DEMOLITION AND DISPOSAL	EACH	6	$250,000.00	$1,500,000.00
TRAFFIC CONTROL	L. SUM	1	$50,000.00	$50,000.00
CONSTRUCTION LAYOUT	L. SUM	1	$75,000.00	$75,000.00

SUBTOTAL =	$2,430,500.00
CONTINGENCY (30%) =	$729,150.00
CONSTRUCTION TOTAL =	**$3,159,650.00**
DESIGN ENGINEERING (7.5%) =	$236,973.75
CONSTRUCTION OBSERVATION (7.5%) =	$236,973.75
PERMITTING (5.0%) =	$157,982.50
TOTAL PROJECT COST INCLUDING ENGINEERING =	**$3,791,580.00**

RELOCATE SANITARY SERVICES

NOTES:
1. THIS ESTIMATE DOES NOT INCLUDE ROW ACQUISTION, TEMPORARY OR CONSTRUCTION EASEMENTS, OR RELOCATING ANY EXISTING UTILITIES
2. PRICES ABOVE ARE 2014 CONSTRUCTION COSTS.

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
Project Number: 14-0092
Date: March 9, 2015

Village of Villa Park, Proposed Drainage Improvements
WASHINGTON

ITEMS	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
EARTH EXCAVATION	CU YD	15,000	$30.00	$450,000.00
TREE REMOVAL	ACRE	2.1	$10,000.00	$21,000.00
TOPSOIL STRIPPING AND PLACEMENT	SQ YD	10,000	$10.00	$100,000.00
SEEDING	SQ YD	10,000	$2.00	$20,000.00
EROSION CONTROL BLANKET	SQ YD	10,000	$4.00	$40,000.00
STORM SEWER, RCP 24"	FOOT	110	$100.00	$11,000.00
STORM SEWER, RCP 42"	FOOT	95	$150.00	$14,250.00
STORM SEWER, RCP 60"	FOOT	50	$200.00	$10,000.00
STORM SEWER, 4'x4' RCBC	FOOT	50	$250.00	$12,500.00
MANHOLES, 5' DIAMETER	EACH	2	$7,500.00	$15,000.00
MANHOLES, 7' DIAMETER	EACH	2	$9,000.00	$18,000.00
24" FLARED END SECTION W/ GRATE	EACH	1	$3,500.00	$3,500.00
42" FLARED END SECTION W/ GRATE	EACH	1	$5,000.00	$5,000.00
60" FLARED END SECTION W/ GRATE	EACH	1	$6,000.00	$6,000.00
RCBC FLARED END SECTION W/ GRATE	EACH	1	$7,000.00	$7,000.00
STONE RIPRAP W/ FILTER FABRIC	SQ YD	50	$50.00	$2,500.00
CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT	FOOT	250	$22.00	$5,500.00
CONCRETE SIDEWALK REMOVAL AND REPLACEMENT	SQ FT	500	$15.00	$7,500.00
DETECTABLE WARNINGS	SQ FT	50	$50.00	$2,500.00
DRIVEWAY REMOVAL AND REPLACEMENT	SQ YD	100	$50.00	$5,000.00
SITE DEWATERING	EACH	2	$25,000.00	$50,000.00
SILT FENCE	FOOT	2,500	$5.00	$12,500.00
FENCE REMOVAL AND REPLACEMENT	FOOT	200	$20.00	$4,000.00
HOME DEMOLITION AND DISPOSAL	EACH	7	$250,000.00	$1,750,000.00
TRAFFIC CONTROL	L. SUM	1	$50,000.00	$50,000.00
CONSTRUCTION LAYOUT	L. SUM	1	$75,000.00	$75,000.00

RELOCATE SANITARY SERVICES

SUBTOTAL =	$2,697,750.00
CONTINGENCY (30%) =	$809,325.00
CONSTRUCTION TOTAL =	**$3,507,075.00**
DESIGN ENGINEERING (7.5%) =	$263,030.63
CONSTRUCTION OBSERVATION (7.5%) =	$263,030.63
PERMITTING (5.0%) =	$175,353.75
TOTAL PROJECT COST INCLUDING ENGINEERING =	**$4,208,490.00**

NOTES:
1. THIS ESTIMATE DOES NOT INCLUDE ROW ACQUISTION, TEMPORARY OR CONSTRUCTION EASEMENTS, OR RELOCATING ANY EXISTING UTILITIES
2. PRICES ABOVE ARE 2014 CONSTRUCTION COSTS.

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
Project Number: 14-0092
Date: March 9, 2015
Revised: June 8, 2015

Village of Villa Park, Proposed Drainage Improvements
SEWER SEPARATION - ALTERNATIVE 1 (NEW SANITARY SEWER)

ITEMS	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
SANITARY SEWER, 12"	FOOT	29,410	$80.00	$2,352,800.00
SANITARY MANHOLE	EACH	98	$8,000.00	$784,000.00
CLASS D PATCHES, 6 INCH	SQ YD	33,000	$60.00	$1,980,000.00
TRENCH BACKFILL	CU YD	30,000	$45.00	$1,350,000.00
WATER MAIN SERVICE LINE RELOCATION	EACH	400	$3,000.00	$1,200,000.00
SANITARY SEWER LINE RELOCATION	EACH	400	$1,750.00	$700,000.00
			SUBTOTAL =	$8,366,800.00
			CONTINGENCY (30%) =	$2,510,040.00
			CONSTRUCTION TOTAL =	**$10,876,840.00**
			DESIGN ENGINEERING (7.5%) =	$815,763.00
			CONSTRUCTION OBSERVATION (7.5%) =	$815,763.00
			PERMITTING (5.0%) =	$543,842.00
			TOTAL PROJECT COST INCLUDING ENGINEERING =	**$13,052,208.00**

NOTES:
1. THIS ESTIMATE DOES NOT INCLUDE ROW ACQUISTION, TEMPORARY OR CONSTRUCTION EASEMENTS, OR RELOCATING ANY EXISTING UTILITIES
2. PRICES ABOVE ARE 2014 CONSTRUCTION COSTS.

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
Project Number: 14-0092
Date: March 27, 2015
Revised: June 8, 2015

Village of Villa Park, Proposed Drainage Improvements
SEWER SEPARATION - ALTERNATIVE 2 (NEW STORM SEWER)

ITEMS	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
TREE REMOVAL	EACH	10	$500.00	$5,000.00
TOPSOIL STRIPPING AND PLACEMENT	SQ YD	350	$10.00	$3,500.00
SEEDING	SQ YD	350	$2.00	$700.00
EROSION CONTROL BLANKET	SQ YD	350	$4.00	$1,400.00
STORM SEWER, RCP 12"	FOOT	2,630	$110.00	$289,300.00
STORM SEWER, RCP 12" (LATERALS)	FOOT	2,500	$110.00	$275,000.00
STORM SEWER, RCP 15"	FOOT	3,520	$130.00	$457,600.00
STORM SEWER, RCP 24"	FOOT	520	$170.00	$88,400.00
STORM SEWER, RCP 30"	FOOT	450	$215.00	$96,750.00
STORM SEWER, RCP 36"	FOOT	1,350	$250.00	$337,500.00
STORM SEWER, RCP 42"	FOOT	3,900	$275.00	$1,072,500.00
STORM SEWER, RCP 48"	FOOT	2,500	$300.00	$750,000.00
STORM SEWER, RCP 48" (TUNNELED)	FOOT	250	$2,500.00	$625,000.00
INLETS, TYPE A	EACH	180	$2,000.00	$360,000.00
MANHOLES, 4' DIAMETER	EACH	42	$6,500.00	$273,000.00
MANHOLES, 5' DIAMETER	EACH	8	$7,500.00	$60,000.00
MANHOLES, 6' DIAMETER	EACH	32	$7,500.00	$240,000.00
HEADWALL, 48"	EACH	1	$5,000.00	$5,000.00
CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT	FOOT	1,000	$22.00	$22,000.00
CONCRETE SIDEWALK REMOVAL AND REPLACEMENT	SQ FT	500	$15.00	$7,500.00
DETECTABLE WARNINGS	SQ FT	100	$50.00	$5,000.00
CLASS D PATCHES, 6 INCH	SQ YD	1,425	$60.00	$85,500.00
TRENCH BACKFILL	CU YD	15,500	$45.00	$697,500.00
ADJUST SANITARY SEWER MAIN	L. SUM	1	$25,000.00	$25,000.00
ADJUST WATER MAIN	L. SUM	1	$25,000.00	$25,000.00
RELOCATE SANITARY SERVICES	L. SUM	1	$50,000.00	$50,000.00
RELOCATE WATER SERVICES	L. SUM	1	$50,000.00	$50,000.00
BYPASS PUMPING, SEDIMENT FILTER BAGS, COFFERDAM	L. SUM	1	$25,000.00	$25,000.00
THERMOPLASTIC PAVEMENT MARKINGS	L. SUM	1	$5,000.00	$5,000.00
TRAFFIC CONTROL	L. SUM	1	$225,000.00	$225,000.00
CONSTRUCTION LAYOUT	L. SUM	1	$75,000.00	$75,000.00

SUBTOTAL =	$6,238,150.00
CONTINGENCY (30%) =	$1,871,445.00
CONSTRUCTION TOTAL =	**$8,109,595.00**
DESIGN ENGINEERING (7.5%) =	$608,219.63
CONSTRUCTION OBSERVATION (7.5%) =	$608,219.63
PERMITTING (5.0%) =	$405,479.75
TOTAL PROJECT COST INCLUDING ENGINEERING =	**$9,731,514.00**

NOTES:
1. THIS ESTIMATE DOES NOT INCLUDE ROW ACQUISTION, TEMPORARY OR CONSTRUCTION EASEMENTS, OR RELOCATING ANY EXISTING PUBLIC OR PRIVATE UTILITIES.
2. THIS ESTIMATE ASSUMES ALL STORM SEWER WILL BE PATCHED AND THE ROADWAY WILL NOT BE RESURFACED.
3. THIS ESTIMATE ASSUMES ALL PROPOSED STORM SEWER WILL BE INSTALLED IN THE ROADWAY AND DOES NOT CONFLICT WITH OTHER UTILITIES SUCH AS SANITARY SEWER AND WATER MAIN.
4. PRICES ABOVE ARE 2015 CONSTRUCTION COSTS.

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
Project Number: 14-0092
Date: December 24, 2014

Village of Villa Park, Proposed Drainage Improvements
AREA 2 - ASTOR AND MYRTLE

ITEMS	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
EARTH EXCAVATION	CU YD	2,550	$30.00	$76,500.00
UNDERGROUND STORAGE VAULT	AC-FT	0.6	$300,000.00	$180,000.00
TREE REMOVAL	EACH	5	$500.00	$2,500.00
TOPSOIL STRIPPING AND PLACEMENT	SQ YD	2,200	$10.00	$22,000.00
SEEDING	SQ YD	2,200	$2.00	$4,400.00
EROSION CONTROL BLANKET	SQ YD	2,200	$4.00	$8,800.00
STORM SEWER, RCP 30"	FOOT	250	$100.00	$25,000.00
STORM SEWER, RCP 36"	FOOT	850	$110.00	$93,500.00
MANHOLES, 4' DIAMETER	EACH	2	$6,500.00	$13,000.00
MANHOLES, 5' DIAMETER	EACH	2	$7,500.00	$15,000.00
MANHOLES, 6' DIAMETER	EACH	2	$8,500.00	$17,000.00
MANHOLES, 8'-DIAMETER	EACH	1	$10,000.00	$10,000.00
CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT	FOOT	1,500	$22.00	$33,000.00
CONCRETE SIDEWALK REMOVAL AND REPLACEMENT	SQ FT	5,000	$15.00	$75,000.00
DETECTABLE WARNINGS	SQ FT	100	$50.00	$5,000.00
CLASS D PATCHES, 6 INCH	SQ YD	900	$60.00	$54,000.00
AGGREGATE BASE COURSE, 10"	SQ YD	1,200	$10.00	$12,000.00
HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N50	TON	140	$85.00	$11,900.00
HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N50	TON	175	$85.00	$14,875.00
DRIVEWAY REMOVAL AND REPLACEMENT	SQ YD	200	$50.00	$10,000.00
TRENCH BACKFILL	CU YD	2,000	$45.00	$90,000.00
SITE DEWATERING	EACH	2	$25,000.00	$50,000.00
SILT FENCE	FOOT	500	$5.00	$2,500.00
WATER MAIN SERVICE LINE RELOCATION	EACH	15	$3,000.00	$45,000.00
SANITARY SEWER LINE RELOCATION	EACH	15	$1,750.00	$26,250.00
TRAFFIC CONTROL	L. SUM	1	$35,000.00	$35,000.00
CONSTRUCTION LAYOUT	L. SUM	1	$50,000.00	$50,000.00

SUBTOTAL =	$982,225.00
CONTINGENCY (30%) =	$294,667.50
CONSTRUCTION TOTAL =	**$1,276,892.50**
DESIGN ENGINEERING (7.5%) =	$95,766.94
CONSTRUCTION OBSERVATION (7.5%) =	$95,766.94
PERMITTING (5.0%) =	$63,844.63
TOTAL PROJECT COST INCLUDING ENGINEERING =	**$1,532,271.00**

NOTES:
1. THIS ESTIMATE DOES NOT INCLUDE ROW ACQUISTION, TEMPORARY OR CONSTRUCTION EASEMENTS, OR RELOCATING ANY EXISTING UTILITIES
2. PRICES ABOVE ARE 2014 CONSTRUCTION COSTS.

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
Project Number: 14-0092
Date: June 5, 2015

Village of Villa Park, Proposed Drainage Improvements
ELM STREET - PR 1

ITEMS	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
STORM SEWER, RCP 12" (LATERALS)	FOOT	150	$80.00	$12,000.00
STORM SEWER, RCP 18"	FOOT	255	$90.00	$22,950.00
STORM SEWER, RCP 36"	FOOT	1,305	$110.00	$143,550.00
MANHOLES, 4' DIAMETER	EACH	8	$6,500.00	$52,000.00
CATCH BASINS	EACH	10	$4,000.00	$40,000.00
CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT	FOOT	50	$22.00	$1,100.00
CONCRETE SIDEWALK REMOVAL AND REPLACEMENT	SQ FT	100	$15.00	$1,500.00
DETECTABLE WARNINGS	SQ FT	25	$50.00	$1,250.00
CLASS D PATCHES, 6 INCH	SQ YD	1,775	$60.00	$106,500.00
TRENCH BACKFILL	CU YD	1,000	$45.00	$45,000.00
BALL FIELD AND PLAYGROUND REMOVAL	L. SUM	1	$10,000.00	$10,000.00
BALL FIELD AND PLAYGROUND INSTALLATION	L. SUM	1	$50,000.00	$50,000.00
SITE DEWATERING	EACH	1	$25,000.00	$25,000.00
SILT FENCE	FOOT	1,500	$5.00	$7,500.00
TRAFFIC CONTROL	L. SUM	1	$15,000.00	$15,000.00
CONSTRUCTION LAYOUT	L. SUM	1	$20,000.00	$20,000.00

SUBTOTAL =	$553,350.00
CONTINGENCY (30%) =	$166,005.00
CONSTRUCTION TOTAL =	**$719,355.00**
DESIGN ENGINEERING (7.5%) =	$53,951.63
CONSTRUCTION OBSERVATION (7.5%) =	$53,951.63
PERMITTING (5.0%) =	$35,967.75
TOTAL PROJECT COST INCLUDING ENGINEERING =	**$863,226.00**

NOTES:
1. THIS ESTIMATE DOES NOT INCLUDE ROW ACQUISTION, TEMPORARY OR CONSTRUCTION EASEMENTS, OR RELOCATING ANY EXISTING UTILITIES
2. PRICES ABOVE ARE 2014 CONSTRUCTION COSTS.

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
Project Number: 14-0092
Date: December 24, 2014
Revised: March 27, 2015

Village of Villa Park, Proposed Drainage Improvements
ELM STREET - PR 2

ITEMS	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
EARTH EXCAVATION	CU YD	6,200	$30.00	$186,000.00
UNDERGROUND STORAGE VAULT	AC-FT	1.5	$300,000.00	$450,000.00
STORM SEWER, RCP 12" (LATERALS)	FOOT	100	$110.00	$11,000.00
STORM SEWER, 4'x4' RCBC	FOOT	1,300	$300.00	$390,000.00
MANHOLES, 6' DIAMETER	EACH	5	$8,500.00	$42,500.00
CATCH BASINS	EACH	6	$4,000.00	$24,000.00
CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT	FOOT	500	$22.00	$11,000.00
CONCRETE SIDEWALK REMOVAL AND REPLACEMENT	SQ FT	2,500	$15.00	$37,500.00
DETECTABLE WARNINGS	SQ FT	100	$50.00	$5,000.00
CLASS D PATCHES, 6 INCH	SQ YD	1,500	$60.00	$90,000.00
TRENCH BACKFILL	CU YD	1,000	$45.00	$45,000.00
SITE DEWATERING	EACH	1	$25,000.00	$25,000.00
SILT FENCE	FOOT	500	$5.00	$2,500.00
TRAFFIC CONTROL	L. SUM	1	$50,000.00	$50,000.00
CONSTRUCTION LAYOUT	L. SUM	1	$50,000.00	$50,000.00

SUBTOTAL =	$1,419,500.00
CONTINGENCY (30%) =	$425,850.00
CONSTRUCTION TOTAL =	**$1,845,350.00**
DESIGN ENGINEERING (7.5%) =	$138,401.25
CONSTRUCTION OBSERVATION (7.5%) =	$138,401.25
PERMITTING (5.0%) =	$92,267.50
TOTAL PROJECT COST INCLUDING ENGINEERING =	**$2,214,420.00**

NOTES:
1. THIS ESTIMATE DOES NOT INCLUDE ROW ACQUISTION, TEMPORARY OR CONSTRUCTION EASEMENTS, OR RELOCATING ANY EXISTING UTILITIES
2. PRICES ABOVE ARE 2014 CONSTRUCTION COSTS.

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
Project Number: 14-0092
Date: December 24, 2014

Village of Villa Park, Proposed Drainage Improvements
ELM STREET - PR 4

ITEMS	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
EARTH EXCAVATION	CU YD	11,000	$30.00	$330,000.00
TREE REMOVAL	EACH	10	$500.00	$5,000.00
TOPSOIL STRIPPING AND PLACEMENT	SQ YD	5,000	$10.00	$50,000.00
SEEDING	SQ YD	5,000	$2.00	$10,000.00
EROSION CONTROL BLANKET	SQ YD	5,000	$4.00	$20,000.00
STORM SEWER, RCP 12"	FOOT	25	$80.00	$2,000.00
STORM SEWER, RCP 12" (LATERALS)	FOOT	30	$80.00	$2,400.00
STORM SEWER, RCP 48"	FOOT	50	$130.00	$6,500.00
MANHOLES, 6' DIAMETER	EACH	1	$8,500.00	$8,500.00
CATCH BASINS	EACH	2	$4,000.00	$8,000.00
12" FLARED END SECTION W/ GRATE	EACH	1	$2,500.00	$2,500.00
STONE RIPRAP W/ FILTER FABRIC	SQ YD	10	$50.00	$500.00
CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT	FOOT	120	$22.00	$2,640.00
CONCRETE SIDEWALK REMOVAL AND REPLACEMENT	SQ FT	75	$15.00	$1,125.00
DETECTABLE WARNINGS	SQ FT	20	$50.00	$1,000.00
CLASS D PATCHES, 6 INCH	SQ YD	100	$60.00	$6,000.00
TRENCH BACKFILL	CU YD	100	$45.00	$4,500.00
SITE DEWATERING	EACH	1	$25,000.00	$25,000.00
SILT FENCE	FOOT	1,000	$5.00	$5,000.00
BUILDING DEMOLITION AND DISPOSAL	L. SUM	1	$250,000.00	$250,000.00
TRAFFIC CONTROL	L. SUM	1	$35,000.00	$35,000.00
CONSTRUCTION LAYOUT	L. SUM	1	$50,000.00	$50,000.00

SUBTOTAL =	$825,665.00
CONTINGENCY (30%) =	$247,699.50
CONSTRUCTION TOTAL =	**$1,073,364.50**
DESIGN ENGINEERING (7.5%) =	$80,502.34
CONSTRUCTION OBSERVATION (7.5%) =	$80,502.34
PERMITTING (5.0%) =	$53,668.23
TOTAL PROJECT COST INCLUDING ENGINEERING =	**$1,288,037.40**

NOTES:
1. THIS ESTIMATE DOES NOT INCLUDE ROW ACQUISTION, TEMPORARY OR CONSTRUCTION EASEMENTS, OR RELOCATING ANY EXISTING UTILITIES.
2. PRICES ABOVE ARE 2014 CONSTRUCTION COSTS.

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
Project Number: 14-0092
Date: March 27, 2015

Village of Villa Park, Proposed Drainage Improvements
SUMMIT

ITEMS	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
EARTH EXCAVATION	CU YD	3,800	$30.00	$114,000.00
TREE REMOVAL	ACRE	0.25	$10,000.00	$2,500.00
TOPSOIL STRIPPING AND PLACEMENT	SQ YD	2,500	$10.00	$25,000.00
SEEDING	SQ YD	2,500	$2.00	$5,000.00
EROSION CONTROL BLANKET	SQ YD	2,500	$4.00	$10,000.00
STORM SEWER, RCP 12" (LATERALS)	FOOT	240	$110.00	$26,400.00
STORM SEWER, RCP 18"	FOOT	900	$150.00	$135,000.00
STORM SEWER, RCP 24"	FOOT	350	$170.00	$59,500.00
MANHOLES, 4' DIAMETER	EACH	6	$6,500.00	$39,000.00
CATCH BASINS	EACH	8	$4,000.00	$32,000.00
18" FLARED END SECTION W/ GRATE	EACH	1	$3,000.00	$3,000.00
24" FLARED END SECTION W/ GRATE	EACH	1	$3,500.00	$3,500.00
STONE RIPRAP W/ FILTER FABRIC	SQ YD	20	$50.00	$1,000.00
CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT	FOOT	50	$22.00	$1,100.00
CONCRETE SIDEWALK REMOVAL AND REPLACEMENT	SQ FT	50	$15.00	$750.00
DETECTABLE WARNINGS	SQ FT	20	$50.00	$1,000.00
CLASS D PATCHES, 6 INCH	SQ YD	700	$60.00	$42,000.00
TRENCH BACKFILL	CU YD	500	$45.00	$22,500.00
SITE DEWATERING	EACH	1	$25,000.00	$25,000.00
SILT FENCE	FOOT	1,750	$5.00	$8,750.00
ADJUST SANITARY SEWER MAIN	L. SUM	1	$5,000.00	$5,000.00
ADJUST WATER MAIN	L. SUM	1	$5,000.00	$5,000.00
TRAFFIC CONTROL	L. SUM	1	$25,000.00	$25,000.00
CONSTRUCTION LAYOUT	L. SUM	1	$20,000.00	$20,000.00

SUBTOTAL =	$612,000.00
CONTINGENCY (30%) =	$183,600.00
CONSTRUCTION TOTAL =	**$795,600.00**
DESIGN ENGINEERING (7.5%) =	$59,670.00
CONSTRUCTION OBSERVATION (7.5%) =	$59,670.00
PERMITTING (5.0%) =	$39,780.00
TOTAL PROJECT COST INCLUDING ENGINEERING =	**$954,720.00**

NOTES:
1. THIS ESTIMATE DOES NOT INCLUDE ROW ACQUISTION, TEMPORARY OR CONSTRUCTION EASEMENTS, OR RELOCATING ANY EXISTING UTILITIES
2. PRICES ABOVE ARE 2015 CONSTRUCTION COSTS.

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
Project Number: 14-0092
Date: December 24, 2014
Revised: March 27, 2015

Village of Villa Park, Proposed Drainage Improvements
SUMMIT AND VILLA

ITEMS	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
EARTH EXCAVATION	CU YD	12,000	$30.00	$360,000.00
TREE REMOVAL	ACRE	1	$10,000.00	$10,000.00
TOPSOIL STRIPPING AND PLACEMENT	SQ YD	5,000	$10.00	$50,000.00
SEEDING	SQ YD	5,000	$2.00	$10,000.00
EROSION CONTROL BLANKET	SQ YD	5,000	$4.00	$20,000.00
STORM SEWER, RCP 12"	FOOT	50	$110.00	$5,500.00
STORM SEWER, RCP 12" (LATERALS)	FOOT	300	$110.00	$33,000.00
STORM SEWER, RCP 18"	FOOT	180	$150.00	$27,000.00
STORM SEWER, RCP 24"	FOOT	208	$170.00	$35,360.00
STORM SEWER, RCP 36"	FOOT	980	$250.00	$245,000.00
STORM SEWER, 1'x2' RCBC	FOOT	610	$160.00	$97,600.00
MANHOLES, 4' DIAMETER	EACH	7	$6,500.00	$45,500.00
MANHOLES, 5' DIAMETER	EACH	4	$7,500.00	$30,000.00
CATCH BASINS	EACH	12	$4,000.00	$48,000.00
12" FLARED END SECTION W/ GRATE	EACH	1	$2,500.00	$2,500.00
18" FLARED END SECTION W/ GRATE	EACH	1	$3,000.00	$3,000.00
36" FLARED END SECTION W/ GRATE	EACH	1	$4,000.00	$4,000.00
STONE RIPRAP W/ FILTER FABRIC	SQ YD	30	$50.00	$1,500.00
CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT	FOOT	50	$22.00	$1,100.00
CONCRETE SIDEWALK REMOVAL AND REPLACEMENT	SQ FT	50	$15.00	$750.00
DETECTABLE WARNINGS	SQ FT	20	$50.00	$1,000.00
CLASS D PATCHES, 6 INCH	SQ YD	850	$60.00	$51,000.00
TRENCH BACKFILL	CU YD	1,200	$45.00	$54,000.00
SITE DEWATERING	EACH	2	$25,000.00	$50,000.00
SILT FENCE	FOOT	1,750	$5.00	$8,750.00
ADJUST SANITARY SEWER MAIN	L. SUM	1	$10,000.00	$10,000.00
ADJUST WATER MAIN	L. SUM	1	$10,000.00	$10,000.00
TRAFFIC CONTROL	L. SUM	1	$50,000.00	$50,000.00
CONSTRUCTION LAYOUT	L. SUM	1	$50,000.00	$50,000.00

SUBTOTAL =	$1,314,560.00
CONTINGENCY (30%) =	$394,368.00
CONSTRUCTION TOTAL =	**$1,708,928.00**
DESIGN ENGINEERING (7.5%) =	$128,169.60
CONSTRUCTION OBSERVATION (7.5%) =	$128,169.60
PERMITTING (5.0%) =	$85,446.40
TOTAL PROJECT COST INCLUDING ENGINEERING =	**$2,050,713.60**

NOTES:
1. THIS ESTIMATE DOES NOT INCLUDE ROW ACQUISTION, TEMPORARY OR CONSTRUCTION EASEMENTS, OR RELOCATING ANY EXISTING UTILITIES
2. PRICES ABOVE ARE 2015 CONSTRUCTION COSTS.

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
Project Number: 14-0092
Date: December 24, 2014
Revised: March 27, 2015

Village of Villa Park, Proposed Drainage Improvements
TWIN LAKES

ITEMS	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
EARTH EXCAVATION	CU YD	16,000	$30.00	$480,000.00
TREE REMOVAL	ACRE	3.5	$10,000.00	$35,000.00
TOPSOIL STRIPPING AND PLACEMENT	SQ YD	30,000	$10.00	$300,000.00
SEEDING	SQ YD	30,000	$2.00	$60,000.00
EROSION CONTROL BLANKET	SQ YD	30,000	$4.00	$120,000.00
DITCH REGRADING	FOOT	350	$25.00	$8,750.00
STORM SEWER, RCP 10"	FOOT	250	$100.00	$25,000.00
STORM SEWER, RCP 12"	FOOT	60	$110.00	$6,600.00
STORM SEWER, RCP 18"	FOOT	125	$150.00	$18,750.00
STORM SEWER, RCP 24"	FOOT	1,480	$170.00	$251,600.00
STORM SEWER, RCP 36"	FOOT	500	$250.00	$125,000.00
STORM SEWER, 19"x30" RCEP	FOOT	740	$175.00	$129,500.00
STORM SEWER, 1'x2' RCBC	FOOT	200	$160.00	$32,000.00
STORM SEWER, 2'x3' RCBC	FOOT	485	$200.00	$97,000.00
TRENCH BACKFILL	CU YD	300	$45.00	$13,500.00
MANHOLES, 4' DIAMETER	EACH	10	$6,500.00	$65,000.00
MANHOLES, 5' DIAMETER	EACH	6	$7,500.00	$45,000.00
10" FLARED END SECTION W/ GRATE	EACH	2	$2,000.00	$4,000.00
18" FLARED END SECTION W/ GRATE	EACH	1	$3,000.00	$3,000.00
24" FLARED END SECTION W/ GRATE	EACH	3	$3,500.00	$10,500.00
36" FLARED END SECTION W/ GRATE	EACH	1	$4,500.00	$4,500.00
RCBC FLARED END SECTION	EACH	3	$7,000.00	$21,000.00
STONE RIPRAP W/ FILTER FABRIC	SQ YD	100	$50.00	$5,000.00
CLASS D PATCHING, 6 INCH	SQ YD	750	$60.00	$45,000.00
STABILIZED CONSTRUCTION ENTRANCE	L. SUM	1	$10,000.00	$10,000.00
SILT FENCE	FOOT	7,500	$5.00	$37,500.00
SITE DEWATERING (BYPASS PUMPING, COFFERDAM, SEDIMENT FILTER BAGS)	EACH	3	$15,000.00	$45,000.00
TRAFFIC CONTROL	L. SUM	1	$75,000.00	$75,000.00
CONSTRUCTION LAYOUT	L. SUM	1	$50,000.00	$50,000.00

SUBTOTAL =	$2,123,200.00
CONTINGENCY (30%) =	$636,960.00
CONSTRUCTION TOTAL =	**$2,760,160.00**
DESIGN ENGINEERING (7.5%) =	$207,012.00
CONSTRUCTION OBSERVATION (7.5%) =	$207,012.00
PERMITTING (5.0%) =	$138,008.00
TOTAL PROJECT COST INCLUDING ENGINEERING =	**$3,312,192.00**

NOTES:
1. THIS ESTIMATE DOES NOT INCLUDE ROW ACQUISTION, TEMPORARY OR CONSTRUCTION EASEMENTS, OR RELOCATING ANY EXISTING PUBLIC OR PRIVATE UTILITIES.
2. THIS ESTIMATE ASSUMES ALL STORM SEWER WILL BE PATCHED AND THE ROADWAY WILL NOT BE RESURFACED.
3. THIS ESTIMATE ASSUMES ALL PROPOSED STORM SEWER WILL BE INSTALLED IN THE ROADWAY AND DOES NOT CONFLICT WITH OTHER UTILITIES SUCH AS SANITARY SEWER AND WATER MAIN.
4. PRICES ABOVE ARE 2015 CONSTRUCTION COSTS.

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
Project Number: 14-0092
Date: December 24, 2014
Revised: April 8, 2015

Village of Villa Park, Proposed Drainage Improvements
ODEUM

ITEMS	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
TREE REMOVAL	EACH	15	$500.00	$7,500.00
PROPOSED TREE	EACH	15	$500.00	$7,500.00
HEDGE REMOVAL AND REPLACEMENT	SQ YD	175	$75.00	$13,125.00
TOPSOIL STRIPPING AND PLACEMENT	SQ YD	550	$10.00	$5,500.00
SEEDING	SQ YD	550	$2.00	$1,100.00
EROSION CONTROL BLANKET	SQ YD	550	$4.00	$2,200.00
FLOODWALL	FOOT	1,300	$400.00	$520,000.00
FLOODBREAK	SQ FT	60	$1,400.00	$84,000.00
CLASS D PATCHES, 6 INCH	SQ YD	1,050	$60.00	$63,000.00
THERMOPLASTIC PAVEMENT MARKINGS	L. SUM	1	$1,000.00	$1,000.00
TRAFFIC CONTROL	L. SUM	1	$10,000.00	$10,000.00
CONSTRUCTION LAYOUT	L. SUM	1	$10,000.00	$10,000.00

SUBTOTAL =	$724,925.00
CONTINGENCY (30%) =	$217,477.50
CONSTRUCTION TOTAL =	**$942,402.50**
DESIGN ENGINEERING (7.5%) =	$70,680.19
CONSTRUCTION OBSERVATION (7.5%) =	$70,680.19
PERMITTING (5.0%) =	$47,120.13
TOTAL PROJECT COST INCLUDING ENGINEERING =	**$1,130,883.00**

NOTES:
1. THIS ESTIMATE DOES NOT INCLUDE ROW ACQUISTION, TEMPORARY OR CONSTRUCTION EASEMENTS, OR RELOCATING ANY EXISTING UTILITIES
2. PRICES ABOVE ARE 2014 CONSTRUCTION COSTS.

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
Project Number: 14-0092
Date: December 24, 2014
Revised: March 9, 2015

Village of Villa Park, Proposed Drainage Improvements
AREA 9 - MICHIGAN (100 YEAR)

ITEMS	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
EARTH EXCAVATION	CU YD	4,700	$30.00	$141,000.00
UNDERGROUND STORAGE VAULT	AC-FT	2.75	$300,000.00	$825,000.00
TREE REMOVAL	ACRE	1	$10,000.00	$10,000.00
TOPSOIL STRIPPING AND PLACEMENT	SQ YD	1,800	$10.00	$18,000.00
SEEDING	SQ YD	1,800	$2.00	$3,600.00
EROSION CONTROL BLANKET	SQ YD	1,800	$4.00	$7,200.00
STORM SEWER, RCP 24"	FOOT	423	$95.00	$40,185.00
STORM SEWER, RCP 36"	FOOT	321	$110.00	$35,310.00
STORM SEWER, RCP 42"	FOOT	1,658	$150.00	$248,700.00
MANHOLES, 5' DIAMETER	EACH	7	$7,500.00	$52,500.00
MANHOLES, 6' DIAMETER	EACH	2	$8,500.00	$17,000.00
42" FLARED END SECTION W/ GRATE	EACH	1	$5,000.00	$5,000.00
STONE RIPRAP W/ FILTER FABRIC	SQ YD	10	$50.00	$500.00
SANITARY SEWER, 12"	FOOT	1,560	$80.00	$124,800.00
SANITARY MANHOLE	EACH	7	$8,000.00	$56,000.00
CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT	FOOT	2,500	$22.00	$55,000.00
CONCRETE SIDEWALK REMOVAL AND REPLACEMENT	SQ FT	12,000	$15.00	$180,000.00
DETECTABLE WARNINGS	SQ FT	150	$50.00	$7,500.00
CLASS D PATCHES, 6 INCH	SQ YD	2,700	$60.00	$162,000.00
DRIVEWAY REMOVAL AND REPLACEMENT	SQ YD	1,300	$50.00	$65,000.00
TRENCH BACKFILL	CU YD	3,600	$45.00	$162,000.00
SITE DEWATERING	EACH	1	$25,000.00	$25,000.00
SILT FENCE	FOOT	1,700	$5.00	$8,500.00
WATER MAIN SERVICE LINE RELOCATION	EACH	20	$3,000.00	$60,000.00
SANITARY SEWER LINE RELOCATION	EACH	20	$1,750.00	$35,000.00
THERMOPLASTIC PAVEMENT MARKINGS	L. SUM	1	$5,000.00	$5,000.00
TRAFFIC CONTROL	L. SUM	1	$50,000.00	$50,000.00
CONSTRUCTION LAYOUT	L. SUM	1	$75,000.00	$75,000.00

SUBTOTAL =	$2,474,795.00
CONTINGENCY (30%) =	$742,438.50
CONSTRUCTION TOTAL =	**$3,217,233.50**
DESIGN ENGINEERING (7.5%) =	$241,292.51
CONSTRUCTION OBSERVATION (7.5%) =	$241,292.51
PERMITTING (5.0%) =	$160,861.68
TOTAL PROJECT COST INCLUDING ENGINEERING =	**$3,860,680.20**

NOTES:
1. THIS ESTIMATE DOES NOT INCLUDE ROW ACQUISTION, TEMPORARY OR CONSTRUCTION EASEMENTS, OR RELOCATING ANY EXISTING UTILITIES
2. PRICES ABOVE ARE 2014 CONSTRUCTION COSTS.

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
Project Number: 14-0092
Date: March 27, 2015

Village of Villa Park, Proposed Drainage Improvements
RIORDAN ROAD

ITEMS	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
EARTH EXCAVATION	CU YD	2,500	$30.00	$75,000.00
TREE REMOVAL	EACH	3	$500.00	$1,500.00
TOPSOIL STRIPPING AND PLACEMENT	SQ YD	3,000	$10.00	$30,000.00
SEEDING	SQ YD	3,000	$2.00	$6,000.00
EROSION CONTROL BLANKET	SQ YD	3,000	$4.00	$12,000.00
STORM SEWER, RCP 18"	FOOT	115	$150.00	$17,250.00
STORM SEWER, RCP 24"	FOOT	350	$170.00	$59,500.00
TRENCH BACKFILL	CU YD	30	$45.00	$1,350.00
MANHOLES, 4' DIAMETER	EACH	3	$6,500.00	$19,500.00
12" FLARED END SECTION W/ GRATE	EACH	2	$2,500.00	$5,000.00
18" FLARED END SECTION W/ GRATE	EACH	2	$3,000.00	$6,000.00
24" FLARED END SECTION W/ GRATE	EACH	1	$3,500.00	$3,500.00
STONE RIPRAP W/ FILTER FABRIC	SQ YD	50	$50.00	$2,500.00
CLASS D PATCHING	SQ YD	25	$60.00	$1,500.00
DRIVEWAY REMOVAL AND REPLACEMENT	SQ YD	15	$65.00	$975.00
SILT FENCE	FOOT	1,000	$5.00	$5,000.00
SITE DEWATERING	EACH	1	$10,000.00	$10,000.00
TRAFFIC CONTROL	L. SUM	1	$10,000.00	$10,000.00
CONSTRUCTION LAYOUT	L. SUM	1	$15,000.00	$15,000.00
			SUBTOTAL =	$281,575.00
			CONTINGENCY (30%) =	$84,472.50
			CONSTRUCTION TOTAL =	**$366,047.50**
			DESIGN ENGINEERING (7.5%) =	$27,453.56
			CONSTRUCTION OBSERVATION (7.5%) =	$27,453.56
			PERMITTING (5.0%) =	$18,302.38
			TOTAL PROJECT COST INCLUDING ENGINEERING =	**$439,257.00**

NOTES:

1. THIS ESTIMATE DOES NOT INCLUDE ROW ACQUISTION, TEMPORARY OR CONSTRUCTION EASEMENTS, OR RELOCATING ANY EXISTING PUBLIC OR PRIVATE UTILITIES.
2. THIS ESTIMATE ASSUMES ALL STORM SEWER WILL BE PATCHED AND THE ROADWAY WILL NOT BE RESURFACED.
3. THIS ESTIMATE ASSUMES ALL PROPOSED STORM SEWER WILL NOT BE IN CONFLICT WITH OTHER UTILITIES SUCH AS SANITARY SEWER AND WATER MAIN.
4. PRICES ABOVE ARE 2015 CONSTRUCTION COSTS.

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
Project Number: 14-0092
Date: March 27, 2015

Village of Villa Park, Proposed Drainage Improvements
CHARLES AVENUE

ITEMS	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
UNDERGROUND STORAGE VAULT	AC-FT	1.0	$300,000.00	$300,000.00
STORM SEWER, RCP 12"	FOOT	140	$110.00	$15,400.00
STORM SEWER, RCP 12" (LATERALS)	FOOT	300	$110.00	$33,000.00
STORM SEWER, RCP 24"	FOOT	300	$170.00	$51,000.00
STORM SEWER, RCP 48"	FOOT	620	$300.00	$186,000.00
MANHOLES, 4' DIAMETER	EACH	4	$6,500.00	$26,000.00
MANHOLES, 5' DIAMETER	EACH	3	$7,500.00	$22,500.00
CATCH BASINS	EACH	10	$4,000.00	$40,000.00
CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT	FOOT	250	$22.00	$5,500.00
CONCRETE SIDEWALK REMOVAL AND REPLACEMENT	SQ FT	100	$15.00	$1,500.00
DETECTABLE WARNINGS	SQ FT	50	$50.00	$2,500.00
CLASS D PATCHES, 6 INCH	SQ YD	700	$60.00	$42,000.00
TRENCH BACKFILL	CU YD	6,200	$45.00	$279,000.00
RELOCATE SANITARY SERVICES	L. SUM	1	$7,500.00	$7,500.00
RELOCATE WATER SERVICES	L. SUM	1	$7,500.00	$7,500.00
TRAFFIC CONTROL	L. SUM	1	$40,000.00	$40,000.00
CONSTRUCTION LAYOUT	L. SUM	1	$25,000.00	$25,000.00

SUBTOTAL =	$1,084,400.00
CONTINGENCY (30%) =	$325,320.00
CONSTRUCTION TOTAL =	**$1,409,720.00**
DESIGN ENGINEERING (7.5%) =	$105,729.00
CONSTRUCTION OBSERVATION (7.5%) =	$105,729.00
PERMITTING (5.0%) =	$70,486.00
TOTAL PROJECT COST INCLUDING ENGINEERING =	**$1,691,664.00**

NOTES:

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2. THIS ESTIMATE ASSUMES ALL STORM SEWER WILL BE PATCHED AND THE ROADWAY WILL NOT BE RESURFACED.
3. THIS ESTIMATE ASSUMES ALL PROPOSED STORM SEWER WILL BE INSTALLED IN THE ROADWAY AND DOES NOT CONFLICT WITH OTHER UTILITIES SUCH AS SANITARY SEWER AND WATER MAIN.
4. PRICES ABOVE ARE 2015 CONSTRUCTION COSTS.

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
Project Number: 14-0092
Date: April 3, 2015

Village of Villa Park, Proposed Drainage Improvements
ROTARY PARK

ITEMS	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
EARTH EXCAVATION	CU YD	1,450	$30.00	$43,500.00
TREE REMOVAL	EACH	5	$500.00	$2,500.00
TOPSOIL, FURNISH AND PLACE	SQ YD	4,200	$7.00	$29,400.00
SEEDING	SQ YD	4,200	$4.00	$16,800.00
EROSION CONTROL BLANKET	SQ YD	4,200	$6.00	$25,200.00
CONCRETE SIDEWALK REMOVAL AND REPLACEMENT	SQ FT	200	$25.00	$5,000.00
PATH REMOVAL AND REPLACEMNT	SQ YD	100	$75.00	$7,500.00
SILT FENCE	FOOT	1,000	$5.00	$5,000.00
PARKING LOT REMOVAL	L. SUM	1	$10,000.00	$10,000.00
GAZEBO REMOVAL	L. SUM	1	$2,500.00	$2,500.00
BUILDING REMOVAL	L. SUM	1	$10,000.00	$10,000.00
SITE DEWATERING	EACH	1	$5,000.00	$5,000.00
TRAFFIC CONTROL	L. SUM	1	$7,500.00	$7,500.00
CONSTRUCTION LAYOUT	L. SUM	1	$15,000.00	$15,000.00

SUBTOTAL =	$184,900.00
CONTINGENCY (30%) =	$55,470.00
CONSTRUCTION TOTAL =	**$240,370.00**
DESIGN ENGINEERING (7.5%) =	$18,027.75
CONSTRUCTION OBSERVATION (7.5%) =	$18,027.75
PERMITTING (5.0%) =	$12,018.50
TOTAL PROJECT COST INCLUDING ENGINEERING =	**$288,444.00**

NOTES:
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2. PRICES ABOVE ARE 2015 CONSTRUCTION COSTS.

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
Project Number: 14-0092
Date: April 3, 2015

Village of Villa Park, Proposed Drainage Improvements
OVALTINE POND

ITEMS	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
EARTH EXCAVATION	CU YD	800	$30.00	$24,000.00
TREE REMOVAL	EACH	2	$500.00	$1,000.00
TOPSOIL STRIPPING AND PLACEMENT	SQ YD	450	$15.00	$6,750.00
SEEDING	SQ YD	450	$8.00	$3,600.00
EROSION CONTROL BLANKET	SQ YD	450	$10.00	$4,500.00
EXISTING OUTLET MODIFICATION, 12"	L. SUM	1	$5,000.00	$5,000.00
RETAINING WALL	SQ FT	3,450	$40.00	$138,000.00
CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT	FOOT	50	$50.00	$2,500.00
CONCRETE SIDEWALK REMOVAL AND REPLACEMENT	SQ FT	100	$25.00	$2,500.00
SILT FENCE	FOOT	750	$5.00	$3,750.00
SITE DEWATERING	EACH	1	$5,000.00	$5,000.00
TRAFFIC CONTROL	L. SUM	1	$7,500.00	$7,500.00
CONSTRUCTION LAYOUT	L. SUM	1	$15,000.00	$15,000.00

SUBTOTAL =	$219,100.00
CONTINGENCY (30%) =	$65,730.00
CONSTRUCTION TOTAL =	**$284,830.00**
DESIGN ENGINEERING (7.5%) =	$21,362.25
CONSTRUCTION OBSERVATION (7.5%) =	$21,362.25
PERMITTING (5.0%) =	$14,241.50
TOTAL PROJECT COST INCLUDING ENGINEERING =	**$341,796.00**

NOTES:
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2. PRICES ABOVE ARE 2015 CONSTRUCTION COSTS.

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
Project Number: 14-0092
Date: April 3, 2015

Village of Villa Park, Proposed Drainage Improvements
53 S EUCLID

ITEMS	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
EARTH EXCAVATION	CU YD	1,600	$30.00	$48,000.00
TREE REMOVAL	EACH	5	$500.00	$2,500.00
TOPSOIL STRIPPING AND PLACEMENT	SQ YD	1,400	$15.00	$21,000.00
SEEDING	SQ YD	1,400	$6.00	$8,400.00
EROSION CONTROL BLANKET	SQ YD	1,400	$8.00	$11,200.00
STORM SEWER, RCP 12"	FOOT	70	$80.00	$5,600.00
12" FLARED END SECTION W/ GRATE	EACH	1	$2,500.00	$2,500.00
BACKFLOW PREVENTER, 12"	EACH	1	$10,000.00	$10,000.00
CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT	FOOT	50	$50.00	$2,500.00
CONCRETE SIDEWALK REMOVAL AND REPLACEMENT	SQ FT	100	$25.00	$2,500.00
CLASS D PATCHES, 6 INCH	SQ YD	20	$60.00	$1,200.00
TRENCH BACKFILL	CU YD	10	$60.00	$600.00
SILT FENCE	FOOT	800	$5.00	$4,000.00
SITE DEWATERING	EACH	1	$5,000.00	$5,000.00
TRAFFIC CONTROL	L. SUM	1	$5,000.00	$5,000.00
CONSTRUCTION LAYOUT	L. SUM	1	$7,500.00	$7,500.00
			SUBTOTAL =	$137,500.00
			CONTINGENCY (30%) =	$41,250.00
			CONSTRUCTION TOTAL =	**$178,750.00**
			DESIGN ENGINEERING (7.5%) =	$13,406.25
			CONSTRUCTION OBSERVATION (7.5%) =	$13,406.25
			PERMITTING (5.0%) =	$8,937.50
			TOTAL PROJECT COST INCLUDING ENGINEERING =	**$214,500.00**

NOTES:

1. THIS ESTIMATE DOES NOT INCLUDE ROW ACQUISTION, TEMPORARY OR CONSTRUCTION EASEMENTS, OR RELOCATING ANY EXISTING PUBLIC OR PRIVATE UTILITIES.
2. THIS ESTIMATE ASSUMES ALL STORM SEWER WILL BE PATCHED AND THE ROADWAY WILL NOT BE RESURFACED.
3. THIS ESTIMATE ASSUMES SOME PROPOSED STORM SEWER WILL BE INSTALLED IN THE ROADWAY AND DOES NOT CONFLICT WITH OTHER UTILITIES SUCH AS SANITARY SEWER AND WATER MAIN.
4. PRICES ABOVE ARE 2015 CONSTRUCTION COSTS.

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
Project Number: 14-0092
Date: April 3, 2015

Village of Villa Park, Proposed Drainage Improvements
BRER RABBIT MOTEL

ITEMS	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
EARTH EXCAVATION (SPECIAL WASTE NON-HAZARDOUS)	CU YD	4,900	$150.00	$735,000.00
TOPSOIL, FURNISH AND PLACE	SQ YD	4,400	$10.00	$44,000.00
SEEDING	SQ YD	4,400	$5.00	$22,000.00
EROSION CONTROL BLANKET	SQ YD	4,400	$5.00	$22,000.00
STORM SEWER, RCP 8"	FOOT	95	$90.00	$8,550.00
STORM SEWER, RCP 12"	FOOT	60	$110.00	$6,600.00
STORM SEWER, RCP 24"	FOOT	210	$170.00	$35,700.00
STORM SEWER, 24" WM REQ.	FOOT	215	$200.00	$43,000.00
TRENCH BACKFILL	CU YD	25	$60.00	$1,500.00
MANHOLES, 4' DIAMETER	EACH	2	$6,500.00	$13,000.00
MANHOLES, 5' DIAMETER	EACH	1	$7,500.00	$7,500.00
10" FLARED END SECTION W/ GRATE	EACH	2	$2,500.00	$5,000.00
24" FLARED END SECTION W/ GRATE	EACH	3	$3,500.00	$10,500.00
STONE RIPRAP W/ FILTER FABRIC	SQ YD	50	$50.00	$2,500.00
CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT	FOOT	50	$50.00	$2,500.00
CONCRETE SIDEWALK REMOVAL AND REPLACEMENT	SQ FT	200	$25.00	$5,000.00
CLASS B PATCHING	SQ YD	75	$150.00	$11,250.00
DRAINAGE STRUCTURE TO BE REMOVED	EACH	3	$2,500.00	$7,500.00
FENCE REMOVAL AND REPLACEMENT	FOOT	25	$100.00	$2,500.00
SILT FENCE	FOOT	1,000	$5.00	$5,000.00
SITE CLEARING	L. SUM	1	$15,000.00	$15,000.00
SITE DEWATERING (BYPASS PUMPING, COFFERDAM, SEDIMENT FILTER BAGS)	EACH	1	$10,000.00	$10,000.00
TRAFFIC CONTROL	L. SUM	1	$50,000.00	$50,000.00
CONSTRUCTION LAYOUT	L. SUM	1	$30,000.00	$30,000.00

SUBTOTAL =	$1,095,600.00
CONTINGENCY (30%) =	$328,680.00
CONSTRUCTION TOTAL =	**$1,424,280.00**
DESIGN ENGINEERING (7.5%) =	$106,821.00
CONSTRUCTION OBSERVATION (7.5%) =	$106,821.00
PERMITTING (5.0%) =	$71,214.00
TOTAL PROJECT COST INCLUDING ENGINEERING =	**$1,709,136.00**

NOTES:

1. THIS ESTIMATE DOES NOT INCLUDE ROW ACQUISTION, TEMPORARY OR CONSTRUCTION EASEMENTS, OR RELOCATING ANY EXISTING PUBLIC OR PRIVATE UTILITIES.
2. DUE TO EXISTING LAND USE, EXCAVATED MATERIAL IS ASSUMED TO BE CONSIDERED SPECIAL WASTE (NON-HAZARDOUS). CBBEL RECOMMENDS ENVIRONMENTAL SOIL ANALYSIS BE COMPLETED TO VERIFY COMPOSITION OF EXCAVATED MATERIAL. COST MAY BE REDUCED IF MATERIAL IS ABLE TO BE RECEIVED AT CCDD SITE.
3. THIS ESTIMATE ASSUMES ALL STORM SEWER WILL BE PATCHED AND THE ROADWAY WILL NOT BE RESURFACED.
4. THIS ESTIMATE ASSUMES SOME PROPOSED STORM SEWER WILL BE INSTALLED IN THE ROADWAY AND DOES NOT CONFLICT WITH OTHER UTILITIES SUCH AS SANITARY SEWER AND WATER MAIN.
5. UNIT PRICE ASSUMES STORM SEWER BENEATH ARDMORE AVENUE CAN BE INSTALLED VIA OPEN-CUT METHOD.
6. COSTS ASSUME NO OPEN-CUTS NECESSARY IN STATE R.O.W. (NORTH AVENUE/IL-64).
7. PRICES ABOVE ARE 2015 CONSTRUCTION COSTS.

Appendix 2
CD-ROM Containing XP-SWMM Files