DRAFT

CWSRF PROJECT PLAN FOR SEWER SEPARATION

FOR CITY OF GROSSE POINTE FARMS

SEWER SEPARATION PROJECT #_____
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PREPARED BY:
HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915
555 Hulet Drive
Bloomfield Hills, Michigan 48302

ENGINEERING. ENVIRONMENT. EXCELLENCE.
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CHANGES MADE SINCE DRAFT PUBLICATION

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Section 2 – Project Background

Section 3 – Alternative Analysis

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SECTION 1.0 — SUMMARY AND RECOMMENDATION

1.1 SUMMARY

The Project Plan for the City of Grosse Pointe Farms Sewer Separation Project has been prepared using the Project Plan Preparation Guidance of the Clean Water State Revolving Fund (CWSRF) Administrative Rules. While the rates have not been set yet for FY2024, the rate in 2023 are 1.875% and 2.125% for 20-year loans and 30-year loans, respectively. These rules call for compliance with the basic Federal Planning Requirements and the National Environmental Policy Act (NEPA). This Project Plan will serve as a basis for project prioritization and must be submitted to the Michigan Department of Environment, Great Lakes, & Energy (EGLE) by May 1, 2023 in order to be on the project priority list for the fiscal year of 2024.

The proposed projects listed herein as part of this CWSRF Project Plan for the construction of a new storm water pump station, storm water forcemain and gravity sewer, transition structure and outfall, the partial sewer separation (south end) and complete sewer separation in the northwest (NW) Quad plus the northeast (NE) Quad, These projects were a result of the City's Sewer System Evaluation Report (2020). The proposed improvements will reduce/eliminate combined sewer overflows (CSOs) and basement flooding for the design event.

1.2 CONCLUSIONS

The following is a summary of the projects to be addressed:

- New storm water force main and gravity sewer from Chalfonte Avenue to Lake Saint (St.) Clair.
- New storm water pump station at Chalfonte Avenue and Moross Road.
- Complete separation of storm flows north of Moross Road west of Chalfonte Avenue ("NW Quad") and separation of storm flows north of Moross Road and generally west of Ridgeline Road (Country Club of Detroit (CCD) area, known as the "NE Quad").
- Partial sewer separation of high surcharged areas south of Moross Road (McKinley, McMillian & Mt Vernon).

1.3 RECOMMENDATIONS

The selected projects identified in this Plan are the most cost-effective and environmentally-sound alternatives. The following recommendations are therefore made:

- The City Council should pass a resolution formally adopting this Plan.
- The City should apply for a low-interest loan under the CWSRF program.

SECTION 2.0 — PROJECT BACKGROUND

STUDY AREA DESCRIPTION:

The City of Grosse Pointe Farms (GPF) is located in the northeastern portion of Wayne County and is generally bounded by Lake St. Clair to the east, the City of Grosse Pointe to the south, City of Detroit to the west, and the Cities of Grosse Pointe Woods and Grosse Pointe Shores to the north. The location of the City of Grosse Pointe Farms is shown in Figure 2-1. GPF is comprised mainly of single-family residential homes, but also contains some commercial areas with approximately 2.73 square miles (1,750 acres) of land area and a population of approximately 10,148 residents according to the Southeast Michigan Council of Governments (SEMCOG) as of 2020.

The City of Grosse Pointe Farms sanitary and storm sewers were originally constructed as an interconnected combined sewer system in the 1920's as well as the Kerby Road Sewage Pump Station (KRSPS) constructed in 1929.

The City's sanitary sewer collection system contains two (2) districts; the "Inland" and the "Lakeside" Districts, refer to Figure 2.2. The "Inland" District consists of approximately 846 manholes, 722 catch basins and 165,000 linear feet of sewers ranging in size from 6 to 78 inches in diameter. The "Lakeside" District consists of approximately 678 sanitary manholes, 487 storm manholes, 839 catch basins, 138,800 linear feet of sanitary sewers ranging in size from 8 to 54 inches in diameter and 102,400 linear feet of storm sewers ranging in size from 6 to 60 inches in diameter.

In 2000, due to the frequency and magnitude of CSOs into Lake St. Clair, as well as basement flooding, the City undertook a sewer separation program to convert the existing combined sewer system into a separate sanitary sewer system and constructed a new storm sewer system for the area generally east of Ridge Road (this became known as the "Lakeside District"). Ridge Road is aptly named as this road is along a ridgeline whereby the area east of Ridge Road is sloped towards Lake St. Clair and the area west of Ridge Road is sloped towards Chalfonte Avenue. Therefore, in the 2000s, an extremely impactful and cost-effective solution was to separate the combined area next to the lake such that storm water runoff collected from road drainage could be easily conveyed and discharged directly to the lake. This separation project was tremendously successful in reducing CSOs into Lake St. Clair and reducing the occurrence of basement flooding within the area east of Ridge Road. This separated area is known as the Lakeside District whereas the area generally west of Ridge Road is known as the Inland District. Given the topography of the area, the sewers in the Inland District remains a combined sewer system today refer to Figure 2-2.

The Lakeside District separated sanitary sewage from storm water by building a new parallel storm water sewer system, that collects road drainage, with the existing system used for the sanitary sewage. Prior to the separation project in 2000, all roof downspouts, footing drains and catch basins were connected to the Lakeside District combined sewer system. However, during separation, all catch basins were connected to new storm sewers and most roof downspouts were disconnected and redirected to discharge over land via City ordinance. To this day, footing drains are still connected to the Lakeside District sanitary sewer – generating a "wet" sanitary system. All flows from the Lakeside District and the Inland District are conveyed to the Kerby Road Sewage Pumping Station (KRSPS) that pumps to the Fox Creek Enclosure (FCE).

The FCE is currently maintained by others, and was constructed between 1927 and 1930, is approximately 3.3 miles long and terminates at the Fox Creek Backwater Gates structure where the sewage enters a 14-foot diameter Detroit sewer. In GPF, the FCE is a five-pointed arch, 16'-6" wide by 11'-6" high and runs along Chalfonte Avenue. There are many communities tributary to the FCE in addition to GPF. The upstream communities are currently known as the Northeast Sewage Disposal System (NESDS), consist of separated and combined communities and are tributary to the SEMSD controlled Kerby Road Pump Station (KPS). This pump station is located adjacent to the City's KRSPS and also discharges to the FCE.

In 2011, street and basement flooding were recorded during two (2) events on May 25, 2011, and September 10, 2011. The May 25, 2011, flooding occurred during a microburst storm in which 2.7 inches of rainfall was recorded in one hour, and over 4.2 inches of rainfall was recorded in an 18-hour period on soil which was already heavily saturated. During the September 10, 2011, flooding event, approximately 3.5 inches of rainfall was recorded over a 24-hour period. During both events, temporary interruptions of electrical feeds caused issues with pumping operations, resulting in street and basement flooding throughout the Inland District. The locations of all the reported basement backups from both the May and September 2011 events are shown in Figure 2-3. As a result of two (2) major storm events in 2011 and the subsequent State Revolving Fund (SRF) Project Plan, the KRSPS was updated including: a new permanent emergency generator to provide backup power in the event of a power outage from Detroit Edison services, improvements to the station to meet building codes, and general Pump System upgrades. The station currently consists of eight (8) pumps with a peak design flow of approximately 358 million gallons per day (MGD), or 550 cubic feet per second (cfs) of combined sewer flows. Pumps 1-6 handle normal station operation and Pumps 7-8 handle extreme storm events. In conjunction with the pump station upgrades, restricted catch basin covers were installed in locations within the Inland District's combined sewer system to mitigate the peak inflows inundating the sewer system. Runoff is slowed by the use of these restricted catch basin covers thereby creating a temporary ponding effect during high intensity - short duration rainfall events resulting in an accumulation of storm water being stored within the streets. While these structures reduce the peak flow rate into the sewer system, they generally do not reduce the volume of storm water entering the system over time.

Due to the 2011 events, a combined sewer model was created to evaluate various system conditions. The model created is the Environmental Protection Agency (EPA) Storm water Management Model (SWMM). Five (5) years after the 2011 events, a significant rain event occurred in the City of Grosse Pointe Farms between July 6, 2016, and July 8, 2016. During this period 4.02 inches of precipitation was recorded, with a peak intensity of 2.50 inches in one (1) hour. Basement flooding occurred primarily throughout the Inland District and twenty (20) homes reported flooding.

Therefore, starting in 2016, the City undertook a study to determine the most impactful and practical solution that will remove storm flows from the system and minimize the potential for basement flooding within the Inland District. This was accomplished by updating the SWMM model, which was achieved through significant data collection, including nine (9) months of sanitary and combined sewer meter data (14 meter installed and collected data between March and December 2017), survey data, system data and field reconnaissance.

The Sewer System Evaluation report, issued in August 2020 ("2020 Study"), included the review of 13 different alternatives that ranged from complete sewer separation throughout the Inland District, to installing a combined sewer retention basin, to separation of selected areas. The estimated cost ranged from $13 million to $183 million.

The primary goal of each alternative was to minimize the potential for basement flooding in the Inland District (for the design event), with a secondary goal of removing storm water flows from the system as a whole. All 13 alternatives result in a peak flow reduction within the system and 10 alternatives result in storm water removal from

the system. However, Alternative 6 provides the greatest benefit to the system by removing storm flows from the system and eliminating the recent historical reported flooding. This alternative includes partial separation of the high surcharge areas south of Moross, and complete separation of the storm flows north of Moross through the construction of new storm sewers (in the NW/NE Quad), a storm water pump station near the intersection of Chalfonte and Moross, and a storm water force main along Moross from Chalfonte to Lake St. Clair (refer to Figure 2-4).

Following the 2020 Study, the City proceeded with the Basis of Design (BOD) of Alternative 6 and initiated private and public sector engagement. While actively working on the BOD in 2021, the City experienced three (3) significant rain events between June 26 and July 16, 2021. The June 26, 2021 event, in particular, was declared a Presidential major disaster (DR-4494-MI). In the aftermath of the June event, the City set up an online survey for residents to report the depth of basement flooding (refer to Figure 2-5).

The occurrence of significant rain events that has resulted in basement flooding has become more frequent since 2011. Prior to 2011, there may have been cases of reported flooding occasionally, but since 2011, reported cases of basement and street flooding has increased. Table 2-1 represents the six (6) significant events over the past ~ 10 years that resulted in basement and/or street flooding throughout the City.

Table 2-1. Significant Rain Events Since 2011

Date	Depth of Rain (in)	Duration (hours)
05/25/11	2.7	1
09/10/11	3.5	24
07/06/16	2.5	1
06/26/21	6.5	24
07/08/21	1.0	0.25
07/16/21	2.7	6

2.1.1 LAND USE

The largest land use types within the City of Grosse Pointe Farms (excluding open space and utilities) are Residential, Golf Course and Institutional use. The current land uses for the City of Grosse Pointe Farms are shown in Figure 2-7.

Land use for the City was obtained from SEMCOG and is summarized in Table 2-2. Data is per the 2020 Census.

Table 2-2. Land Use Summary

Land Cover Type	Acres
Residential	983.6
Open Space	252.2
Industrial	10.7
Institutional/ Parks	92.3
Commercial/ Business	6.1

*SEMCOG: https://semcog.org/Community-Profiles#Land

2.1.2 POPULATION DATA

According to SEMCOG, the 2020 United States (U.S.) Census estimated the population for the City of Grosse Pointe Farms as 10,148 people, which is an increase of approximately 669 people since 2010. Between 2017 and 2021, the U.S. Census Bureau data estimated the average household size in the City at 2.48 people per household. The population projections for the City of Grosse Pointe Farms are shown below in Table 2-3:

Table 2-3. Population Projections

Year	City of Grosse Pointe Farms Population
2010	9,479
2020	*10,148*
2030	*10,245**
2040	*10,187**

* SEMCOG projections: https://semcog.org/population-estimates

For the purposes of the CWSRF Project Plan, a 20-year projection is required for calculations of future system demand and total present worth. Forecast from SEMCOG projects population in 2040 to be approximately 10,187.

2.1.3 ECONOMIC CHARACTERISTICS

According to the 2020 census data, the major industries in the City are:

- Information & Financial Activities (1,163 people).
- Healthcare Services (793 people).
- Education Services (668 people).
- Professional/Technical services & Corporate HQ (563 people).
- Administrative & Waste Services (563 people).

The median household income for Grosse Pointe Farms is $140,647, a 10.5% increase since 2010. The median household income is higher than the median Michigan household income of $63,498 and the U.S. median household income of $71,186 according to the 2020 census.

** Source: https://semcog.org/Community-Profiles#EconomyJobs*

2.1.4 CULTURAL AND ENVIRONMENTAL SETTINGS

Cultural Setting:

The City of Grosse Pointe Farms project area has two (2) historic properties listed under the National Register of Historic Places. The historic properties listed on the National Register are Richard Elementary located at Ridge Road and McKinley Avenue and a residential house at 33 Old Brook Lane. Since neither property is located within the project limit, they are not anticipated to be impacted by the proposed project. EGLE will be coordinating official impact reviews with the State Historic Preservation Office (SHPO) and the Tribal Historic Preservation Offices (THPO) for final determination of historic properties impacted prior to the start of construction.

Historic places map is shown is Figure 2-8.

Air Quality:

The air quality is not anticipated to be an issue for this project with the exception of temporary dust and debris from construction. All necessary notifications will be distributed to the public when this occurs.

** Source: http://www.deqmiair.org/monitoringdata.cfm?site=1692&date=01-Jun-22*
** Source: https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Programs/AQD/State-Implementation-Plan/non-attainment/Ozone-monitors-2018-20-nonattainment-area.pdf*
** Source: https://www.epa.gov/green-book/green-book-8-hour-ozone-2015-area-information*

Wetlands:

The proposed improvements involve sewer separation and pump station construction. None of the proposed items will be located in proximity to existing wetlands. This investigation was based on reviewing the locations of the proposed project and the National Wetlands Inventory map.

Wetland map is shown in Figure 2-9.

** Source: https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/*

Great Lake Coastal Zones:

The Lake St. Clair shoreline is the only coastal zone in the project area. For this Project Plan, there will not be negative impacts to the Lake or tributary areas. This project will be separating the storm water flow from the combined flow, therefore decreasing the amount of combined sewer overflow and having a positive impact on the shoreline.

The new outfall will be designed to minimize erosion and will follow all permitting and design requirements by EGLE and the United States Army Corp of Engineers (USACE). The new outfall will be similar to all the existing outfalls throughout the City and the details and location have already been reviewed with EGLE to vet out any issues or concerns associated with its layout and location (refer to Appendix E).

Floodplains & Surface Waters:

The floodplain extends along Lake Shore Road, located adjacent to Lake St. Clair. The areas adjacent to or within the floodplain have been used to good advantage through the development of parks, and other recreation facilities. The floodplain in the southern end remains along the shoreline with a buffer between it and the homes (refer to Figure 2-10).

The pump station discharge outfall will be located in the 100-year floodplain boundary (Zone AE) off of Lakeshore Drive. The Federal Emergency Management Agency (FEMA) 100-year flood elevation is 583 feet. Construction of the outfall is the only aspect of the proposed project that will be within the limits of the 100-year floodplain. As previously discussed, the outfall details and location have been reviewed with EGLE to vet out any issues or concerns associated with its layout or location. All regulatory permits will be obtained as previously discussed, including adding the outfall to the City's existing Municipal Separate Storm Sewer System (MS4) permit.

Natural or Wild and Scenic Rivers:

According to the National Park Service Nationwide Rivers Inventory (NRI), there are no designated natural or wild and scenic rivers within the project area.

Recreation Facilities:

Recreational facilities in the vicinity of the planning area include private clubs, semi-public parks and education facilities. The largest such facilities are:

- The Country Club of Detroit (CCD)
- Grosse Pointe South High School
- Grosse Pointe Academy
- St. Paul Catholic Church and School
- Grosse Pointe Farms Dog Park
- Pier Park Harbor
- Richard Elementary School
- Kerby Field
- Messner Field
- Grosse Pointe United Methodist Church
- Living Hope Evangelical Church

Topography:

The topography of the Project Area is typical of Southeastern Michigan. The topographical features were formed by glacial lake deposits and glacial till. The area slopes generally in the direction of Lake St. Clair.

A United States Geological Survey (USGS) topography map of the City is shown in Figure 2-11.

Geology:

The City and surrounding area is typified by Antrim Shale. The Antrim is a highly carbonaceous, thinly laminated, dark gray or brown to mostly black shale with no fossil material apart from abundant algal spores. There was dramatic growth in gas production from the shallow Devonian period. In the lower Antrim, contains large bituminous and pyritic limestone concretions that range in size from 9.6 to 1.5 meters. During the 1970's and 1980s, thousands of wells were drilled in lower Michigan where strong gas shows were discovered while drilled through the Antrim Shale. This discovery shows that Antrim Shale are gas reserves. Antrim gas is mostly the consequence of microbiological (biogenic) activity, with a small amount of thermogenic gas from deeper in the basin.

*Source: http://custom.cengage.com/regional_geology.bak/data/Geo_Michigan_Watermarked.pdf

Soils:

The majority of the Project Area soil is Kibbie- Urban land-Colwood complex. The Kibbie-Urban land-Colwood complex is somewhat poorly drained soil that has a sandy loam subsoil. The surface runoff is medium, and the permeability of water is slow. The available water capacity is low in the upper part of the profile and is moderate in the underlying silty clay loam. The soil located in the northwest side of the project area is Ziegenfuss-Urban land complex that is poorly drained and has a loamy subsoil. The surface runoff is negligible, and the water capacity is high due to sandy, clay and loamy soils. On the south side of the Project Area, the soil is Berms-Urban land complex. The Berms-Urban land complex drains moderately well due to the loamy and sandy subsoil. The runoff of Berms-Urban land complex is very low, and the water capacity is moderate. The data was collected from the USDA.

As part of the final design process, soil borings will be taken near the proposed work areas to determine if any special construction methods will be needed.

Agricultural Resources:

Agricultural resources are limited to small private gardens within residential areas.

Existing Plant and Animal Communities:

According to the Michigan Natural Features Inventory (MNFI), a few species of plants and animals which are considered to be rare, threatened or endangered species by the U.S. Fish and Wildlife service of the Michigan Department of Natural Resources may be encountered within the project area. At present, there are no known regularly occurring or persistent populations in the immediate area. An official MNFI review will be conducted to confirm the species. Those species, which may occur within the project area or Lake St. Clair, are discussed below:

* Source: https://mnfi.anr.msu.edu/species/description/12367/Lampsilis%20fasciola/
* Source https://mnfi.anr.msu.edu/sitesearch/results

1. Fish

The only threatened fish species known to possibly inhabit the waters of Lake St. Clair are the Lake Sturgeon (Acipenser Fulvescens), Silver Chub (Hybopsis Storeriana), and Pugnosed Shiner. In addition, a number of mussels are endangered or threatened such as Wavyrayed Lampmussel, Villosa Fabalis, Alasmidonta Viridis, and among others.

2. Birds

The Kirland's Warbler (Dendrica Kirtlandii) is the most likely endangered (Federal and State) species to occur within the project area. Previous historical records show the species as a rare migrant through southeast Michigan; its passage through the project area would be brief as the bird's nest is the northern regions of the Lower Peninsula of Michigan. There are several other threated species within the area that have been spotted near the vicinity of the project area, but it is unlikely that their habitats will be disturbed.

3. Mammals

The known range of the Indiana Bat (Myotix Sodialis) includes southeast Michigan. Known breeding locations include the underside of bridges, under the exfoliating bark of trees and natural cavities. There are no known nursing colonies located in Wayne County.

4. Plants

At present, there are no known protected species of plants within the project area.

Areas of Contamination

No registered contamination sites were found within the Project Area using the EGLE site environmental online mapper tool.

** Source: https://www.mcgi.state.mi.us/environmentalmapper/#*

Soil Erosion

The soil erosion impact will be mitigated through the Contractors' required compliance with a program for control of soil erosion and sedimentation, as specified in Part 91 of Michigan Act 451, P.A. of 1994. The City of Grosse Pointe Farms will apply for the appropriate soil erosion permits from their subsidiary agency (Wayne County) if required. EGLE will also review design plans to ensure compliance with Part 91 of Michigan Act 451, P.A. of 1994

The proposed improvements involve sanitary sewer separation (which would occur within the road right-of-way), new pump station (which will occur on a City owned parcel) and storm water forcemain (which will occur within an easement and road right-of-way). The planned construction will require clearing of the area, ground excavation, soil storage, and site restoration. The appropriate soil erosion and sedimentation control measures will be undertaken to minimize runoff from construction activities. Once the sewers and associated facilities have been constructed, the project route will be restored to its original state.

Land Use Restriction and Environmental Management

There are no registered land use restricted areas in the project area according to the online EGLE Environmental Mapper tool.

2.2 EXISTING FACILITIES AND ASSETS – GENERAL

The City of Grosse Pointe Farms wastewater collection infrastructure are critical assets for conveying waste, ultimately, preventing the introduction of pollutants into the Lake St. Clair. A description of the City's wastewater infrastructure is provided in the following sections.

2.2.1 SEWER SYSTEM

The City of Grosse Pointe Farms sanitary and storm sewers were originally constructed as an interconnected combined sewer system in the 1920's as well as the Kerby Road Sewage Pump Station (KRSPS) constructed in 1929.

The City's sanitary sewer collection system contains two (2) districts; the "Inland" and the "Lakeside" Districts, refer to Figure 2-2. The "Inland" District consists of approximately 846 manholes, 722 catch basins and 165,000 linear feet of sewers ranging in size from 6 to 78 inches in diameter. The "Lakeside" District consists of approximately 678 sanitary manholes, 487 storm manholes, 839 catch basins, 138,800 linear feet of sanitary sewers ranging in size from 8 to 54 inches in diameter and 102,400 linear feet of storm sewers ranging in size from 6 to 60 inches in diameter.

In 2000, the City undertook a sewer separation project in the area east of Ridge Road, referred to as the "Lakeside" District. The combined sewers in this district were converted to convey only sanitary sewer flows, and new storm sewers were constructed to convey only storm water runoff to Lake St. Clair. This project successfully reduced CSO's into Lake St. Clair and the occurrences of basement flooding in the Lakeside District. All sanitary flows from this district are conveyed through the Kerby Road Interceptor which is a 40-inch by 60-inch egg-shaped brick sewer that generally discharges to the KRSPS. Refer to Section 2.0 for background information on the collection system.

While the sewer separation in the Lakeside District in 2000 was tremendously successful in reducing combined sewer overflows into Lake St. Clair and reducing the occurrences of basement flooding, the City must address the Inland District as basement flooding continues to be recorded in this district.

Within the last five (5) years, the City has not experienced any SSOs in the Lakeside District, however they have and continue to experience basement flooding (and in some cases street flooding) due to significant rain events in the Inland District (refer to Table 2-1).

2.2.2 KERBY ROAD SEWAGE PUMPING STATION

All sanitary and combined sewage in the City flows to the KRSPS where it is lifted and discharged into the FCE. The original pump station was constructed in 1929 and pumps 7 & 8 were added in 1954 in response to flooding events in 1947 and 1954. Pumps 1, 2 and 3 were replaced in the 1960's and limited pump station electrical upgrades were made in 1992. Further renovations were made in 2011 to add a backup generator capable of powering the entire pump station. The flow capacities for each of the eight (8) pumps are listed in Table 2-4.

Table 2-4. Kerby Road Sewage Pumping Station Pump Information

Pump No.	Flow Capacity (cfs)
1	4.5
2	4.5
3	12
4	24
5	75
6	100
7	170
8	170
Total Capacity	**560 cfs**

2.2.3 CITY FLOW METERING & SEWER SYSTEM EVALUATION STUDIES

The City has been actively evaluating and investigating their sanitary sewer system since the early to mid-2000's. During the most recent study (2020 Study), meters were installed in the Lakeside and Inland Districts in 2017 with the primary purpose of calibrating the SWMM model in order to determine the most impactful and practical solution that will remove storm flows from the system and minimize the potential for basement flooding within the Inland District. This was accomplished through significant data collection, including nine (9) months of sanitary and combined sewer meter data, survey data, system data and field reconnaissance. Refer to Appendix A for additional information.

2.3 NEED FOR PROJECT

The purpose of this Project Plan is to address the occurrences of basement flooding and reduce/eliminate CSOs for the design event as described in the City's 2000 Sewer System Evaluation Report (refer to Appendix A).

In addition, the sewer separation projects will also increase the level of service within the sanitary sewer collection system making the system more resilient to impacts from wet weather events that exceed the design event. Lastly, water quality to Lake St. Clair will be improved as the City will be able to convey, and store events larger than the design event before discharge.

Figure 2-1. Project Study Area Map

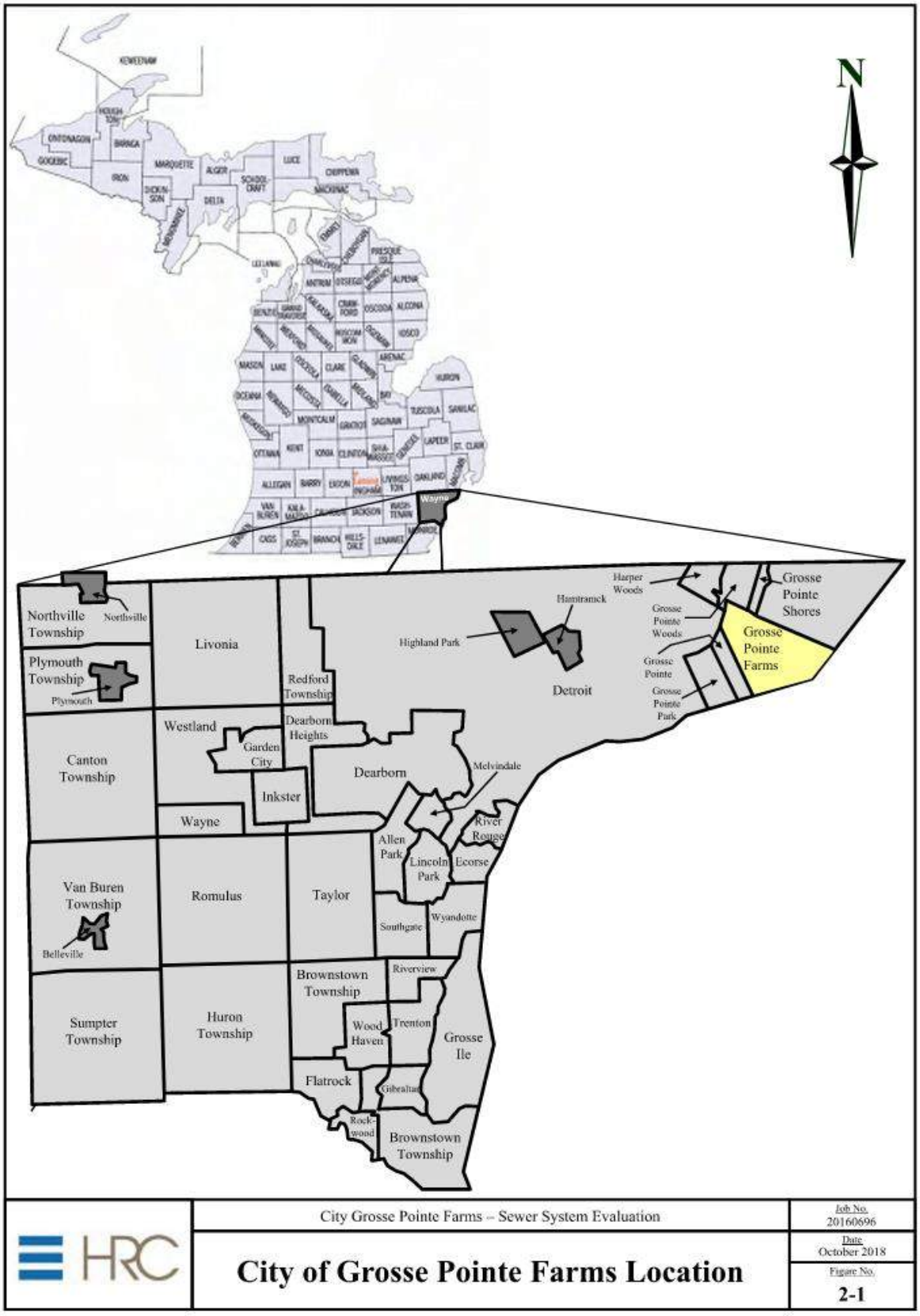

Figure 2-2. Sanitary Sewer Service Area Map

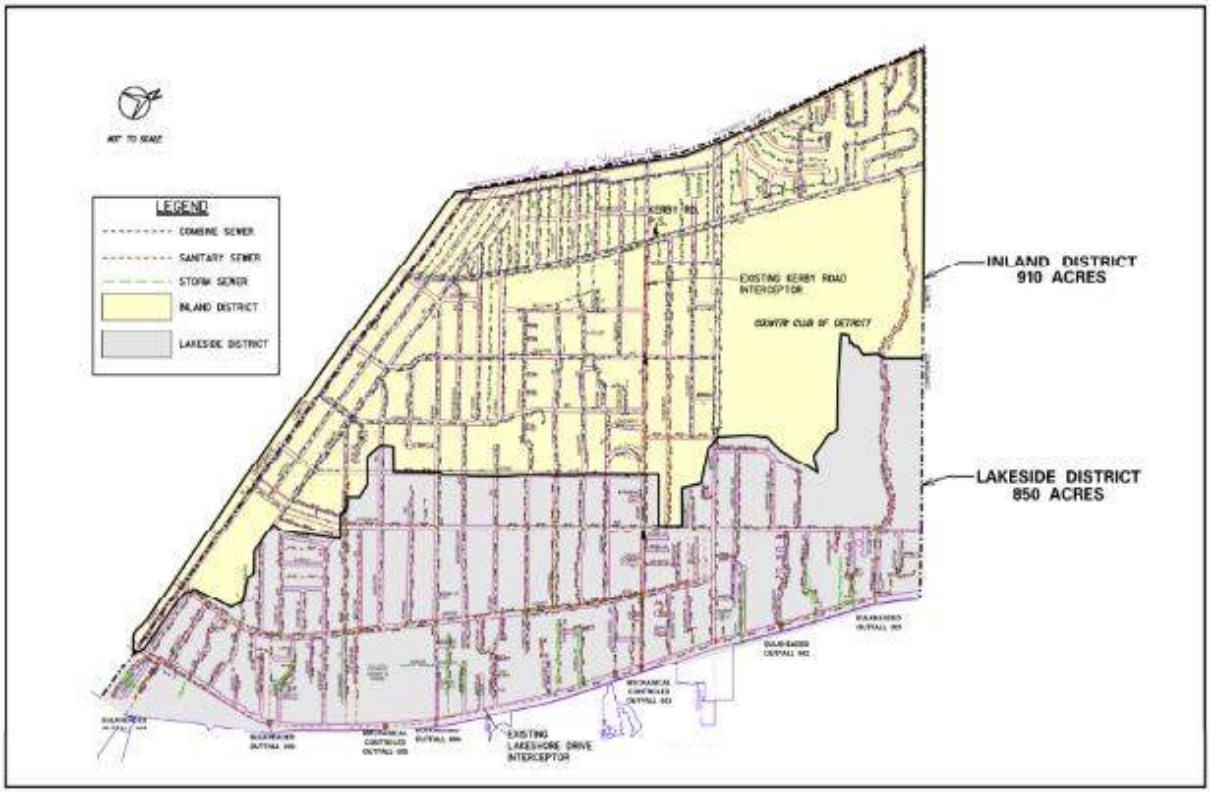

Figure 2-3. Reported Flooding – 2011 May & September Rain Events

Figure 2-4. Sewer Separation Project Locations

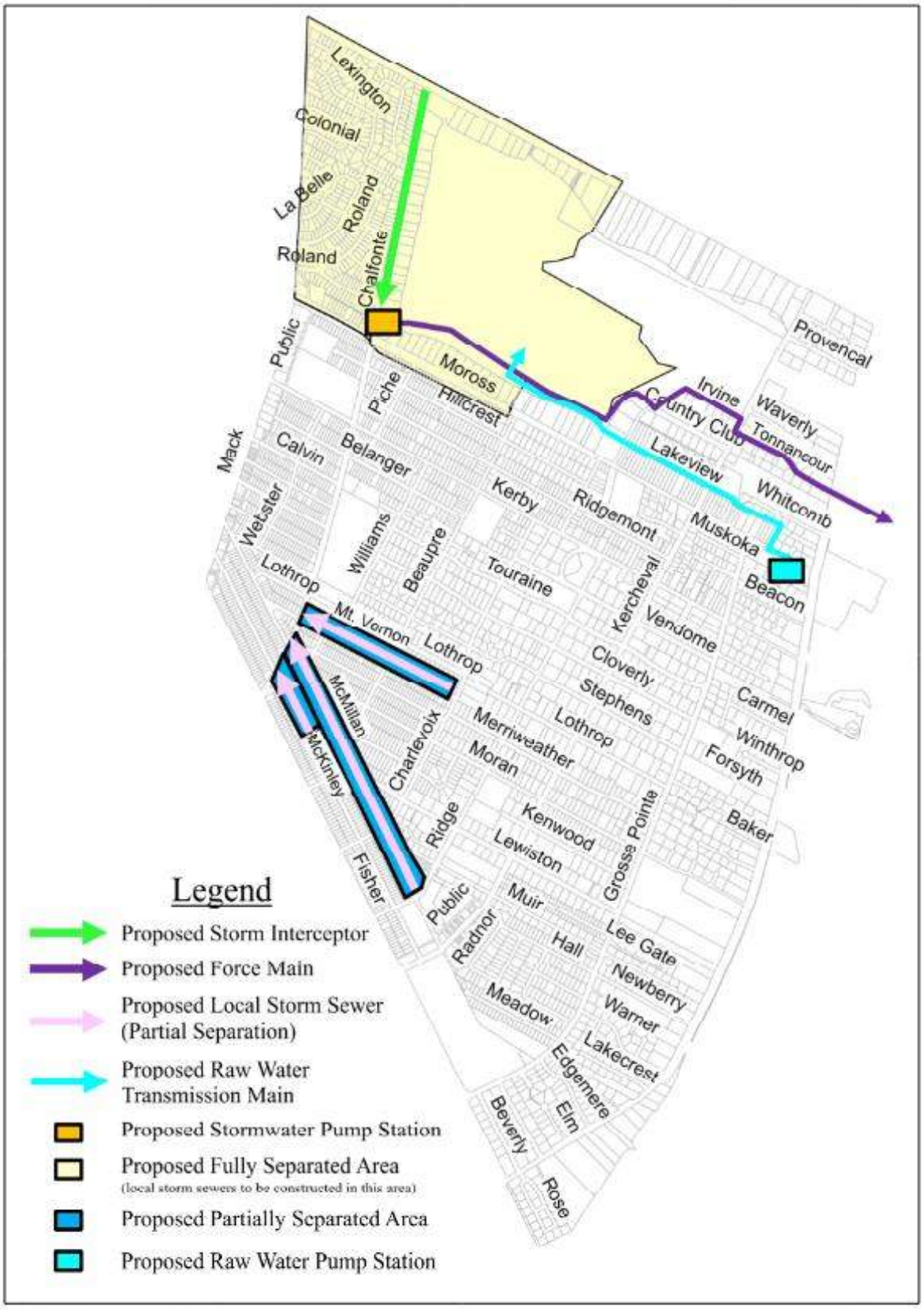

Figure 2-5. July 2016 Flooding Map

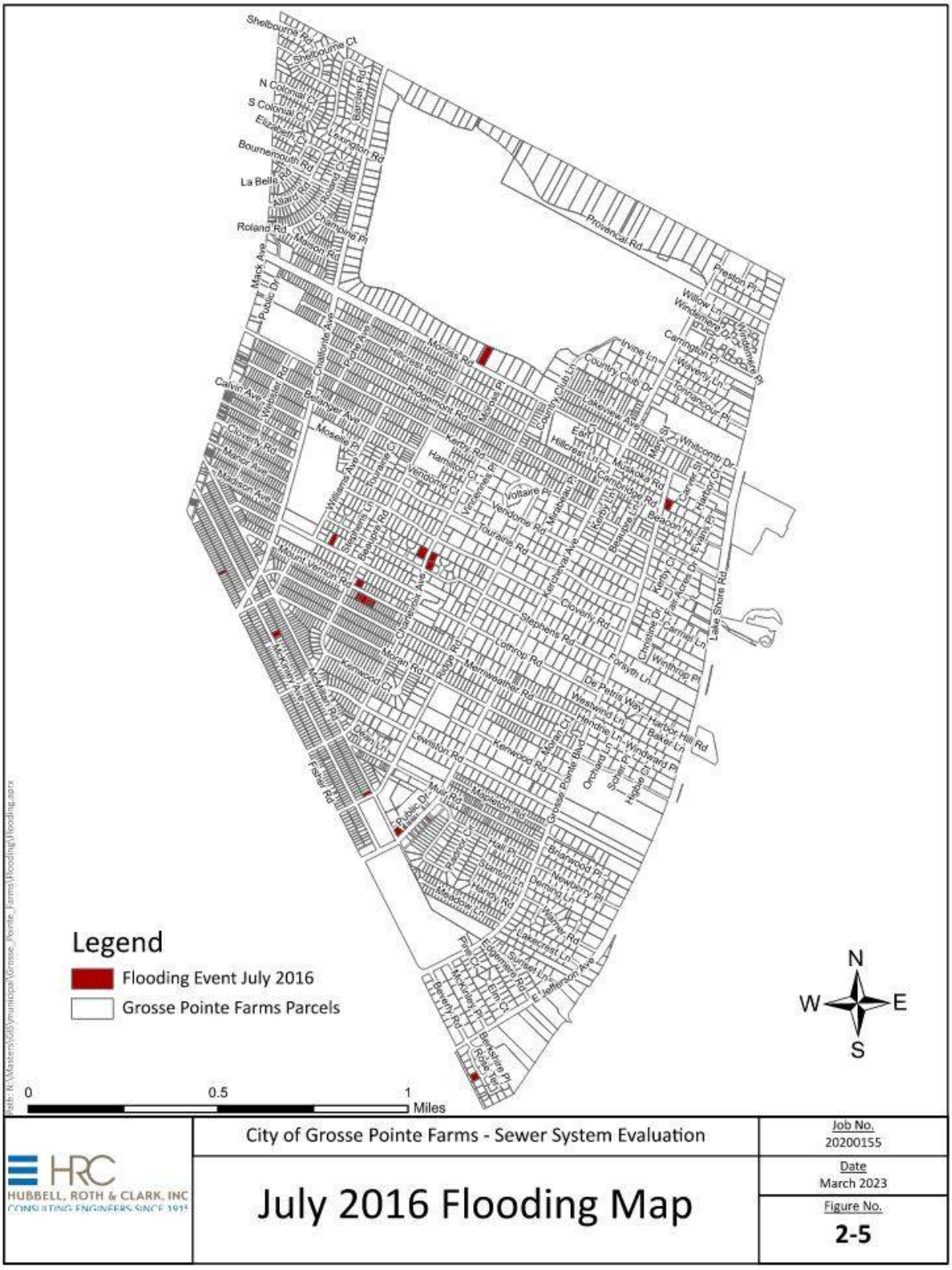

Figure 2-6. Reported 2021 Flooding Map

Figure 2-7. Land Use

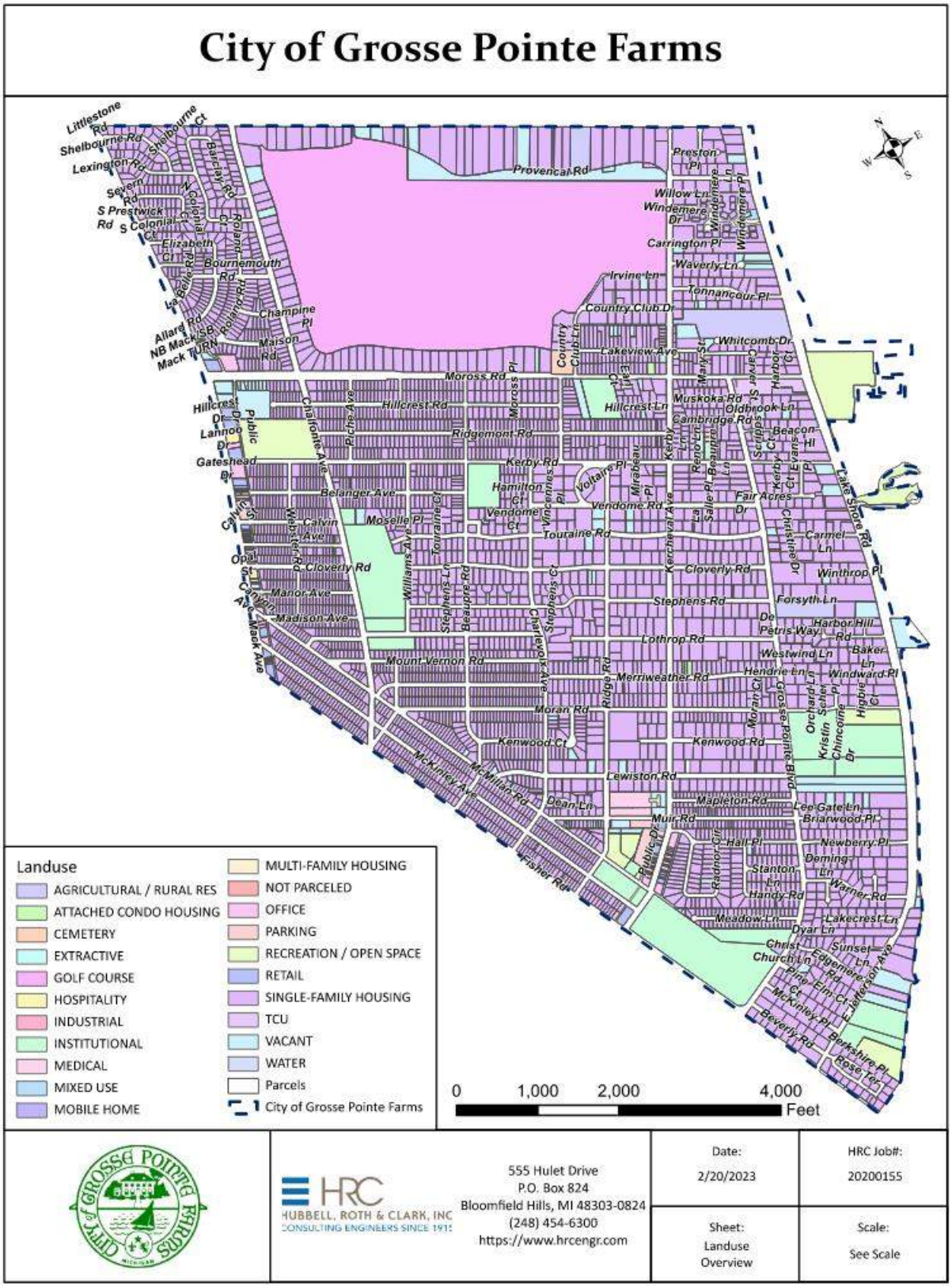

Figure 2-8. Historical Places Map

HRC	The City of Grosse Pointe Farms - CWSRF Project Plan	Job No. 20200155
	National Register of Historic Places	Date February 2023
		Figure No. 2-8

Figure 2-9. Wetlands Map

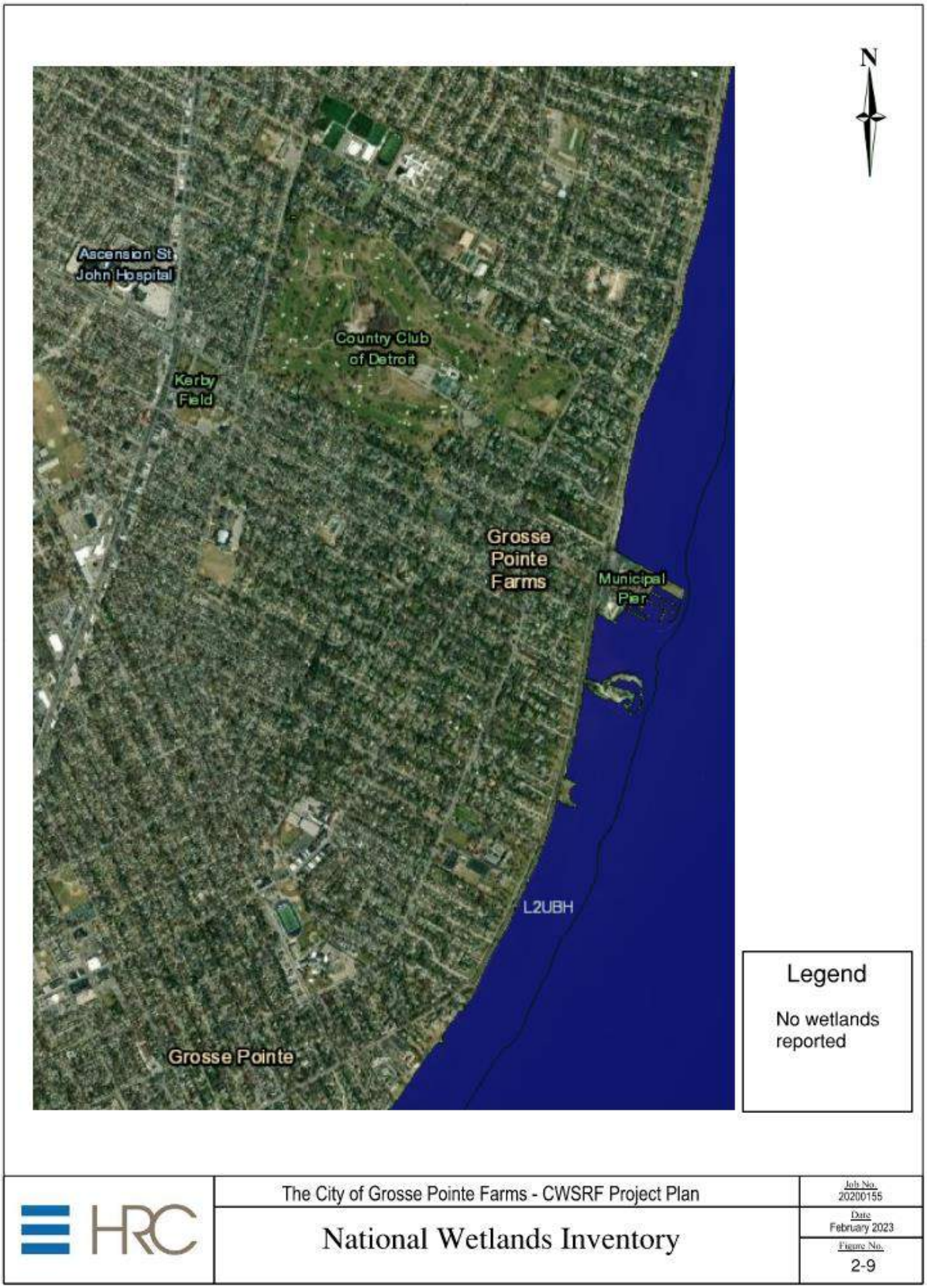

Figure 2-10. FEMA Floodplain Map

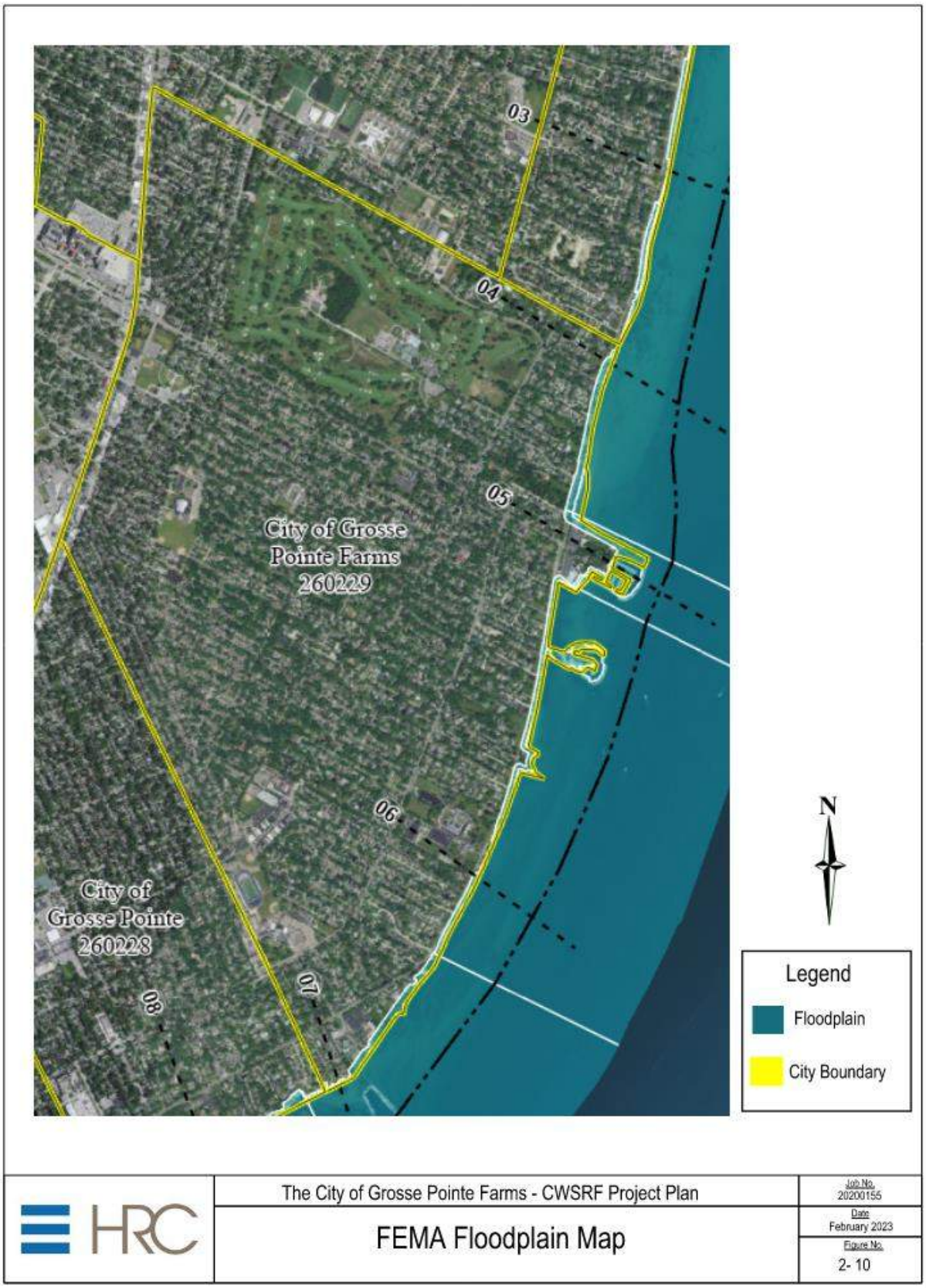

Figure 2-11. Terrain Map

SECTION 3.0 — ALTERNATIVE ANALYSIS

The alternatives considered for each improvement element are:

- Alternative 1 – Sewer Separation Projects
- Alternative 2 – Storm Water Retention Basin & Sewer Separation
- Alternative 3 – "No-Action"
- Alternative 4 – Regionalization

A technical basis has been developed for each improvement element and an economic comparison of alternatives completed where appropriate.

3.1 ALTERNATIVE 1 – SEWER SEPERATION PROJECT

This alternative consists of the following components:

- Constructing a new storm water pump station at the northeast corner of Moross Road and Chalfonte Avenue, along with a new force main (FM) and gravity sewer and gravity sewer to discharge the collected storm water out to Lake St. Clair.
- Removing storm flows from the NW Quad from the City's combined sewer system (localized separation by constructing new storm sewer west of Chalfonte Avenue and north of Moross Road).
- Removing storm flows from the NE Quad from the City's combined sewer system (localized separation). This area includes the west side of the CCD, the west half of Provencal Road and Moross Road between Beaupre Avenue and Chalfonte Avenue.
- Partial separation of the combined sewer east of Chalfonte Avenue along Mt. Vernon Avenue, McMillan Road and McKinley Avenue with the construction of new storm sewers that will discharge into the Chalfonte Interceptor.

3.1.1 NEW STORM WATER FORCE MAIN & GRAVITY SEWER

A combination of a new force main and gravity sewer will be required to convey storm water from the new storm water pumping station to an outfall at Lake St. Clair.

Storm water Force Main

The proposed force main is expected to be a 48-inch diameter, approximately 3,600 feet in length. The pipe material will be determined following a soil boring analysis. The below-grade force main will be installed with a minimum of five (5) feet of cover over the crown of the pipe and will be constructed using open cut construction methods through a proposed easement within the CCD property. (Refer to Appendix E). Due to the proposed length, an air/vacuum relief valve may be necessary. This will be investigated during the design phase.

Transition Structure

A transition structure will be placed near the high point "Ridge Line" of the topography. The "Ridge Line" is the high point throughout the City between the Lakeside and Inland Sewer Districts. It runs in proximity and parallel to Ridge

Road. The transition structure is where the pump station discharge piping will transition from a 48-inch force main to gravity sewer. A preliminary plan and profile that shows the proposed discharge piping alignment, depth and location of the transition structure and outfall structure can be found in Appendix F. The outfall structure is located near Tonnacour Place and Lake Shore Road.

Gravity Sewer

The proposed gravity sewer is expected to range in size from 42- to 60-inch reinforced concrete pipe, approximately 3,200 feet in length. The depth of the sewer will range between three (3) to nine (9) feet and will be installed using open cut construction methods. The proposed route of the gravity sewer can be found in Appendix E.

3.1.2 NEW STORM WATER PUMP STATION

A new storm water pump station will be required to convey the separated storm water to Lake St. Clair. The separated area consists of the area north of Moross between Mack Road (the western most boundary) to approximately Ridge Road or "Ridge Line" (the eastern most boundary).

The new pumping station (refer to Appendix D) will deliver a peak flow of approximately 102 cfs with all pumps in service and normal operating levels in the wet well. The pumping equipment will be installed in a dry well located below grade in a pump room, accessible to personnel by a stairway, and completely isolated from the pump station wet well. Each pump will be equipped with a suction isolation valve, automatic check valve, casing drain valve and discharge isolation valve. Each pump will discharge to a common pipe manifold connected to a 48-inch diameter force main.

Operation of the pumps will be automatically controlled to minimize cycling and to provide adequate velocity in the discharge piping system and force main. Each pump will be equipped with a soft starter to reduce power surges during start-up and designed to operate at full speed. Flexibility will be provided by installing five (5) pumps to handle the entire range of design flows. Each pump will be equally sized at approximately 20 cfs.

The pumping station dry well will include the following: lavatory, electrical gear, equipment control panels, ventilation, dehumidification, stair access to lower levels, access openings, hoist system for pump and equipment removal and drainage sump with duplex sump pumps.

The sump pumps will discharge to the wet well or to an existing combined sewer off of Moross Road or Chalfonte Avenue. Potable and non-potable water for the pumping station will be obtained from the City watermain on Chalfonte Avenue. The non-potable water system will be equipped with a backflow preventor to isolate the system from the potable water system. Non-potable water will be used for hose bibs and flushing connections for maintenance.

3.1.3 NW QUAD AND NE QUAD – SEWER SEPARATION

The NW Quad area consists of residential streets, which are generally 24-foot wide asphalt roads with concrete curb and gutters generally centered within the right of way. The road right of ways are either 50-foot wide (north end – Barclay, Lexington, Shelbourne Road & Court, Roland Court, Bournemouth Circle and the west end of Bournemouth Road) or 60-foot wide (south end – Maison, Champine, Allard, Roland and the east end of Bournemouth Road).

The existing combined sewers servicing this area are located within the right of way (primary in the north end) and rear yards (primary in the south end) and range in size between 12- and 30-inch in diameter. In addition, each street is serviced by either a 6-inch or an 8-inch water main located within the right of way.

New storm sewers are proposed for this area, with the existing combined sewer serving as the new sanitary sewer. The proposed storm sewers will range in size from 15- to 24-inch in diameter and will be located within the road right of way, primarily under the pavement. Depending on the final design and location of the new storm sewers, partial reconstruction (area disturbed by the sewer installation) and milling and overlaying of the remaining portion of these roads after installation may be warranted.

The storm flows from the NW Quad will be collected in five (5) collector sewers that will be connected to the existing sewer (42- to 60-inch) on the east side of Chalfonte Avenue, which will be converted to a storm only sewer. This sewer will be cleaned, televised, evaluated and any necessary repairs made prior to the conversion. The collector sewers will be located at each NW Quad side streets (Barclay, Lexington, Bournemouth, Champine and Maison).

The NE Quad area consists of the west half of Provencal Road, the westerly portion of the CCD and Moross Road between Beaupre Avenue and Chalfonte Avenue (refer to Figure 2-4).

3.1.4 SOUTH END PARTIAL SEPERATION

The south end partial separation is intended to address the high surcharge areas south of Moross Road to eliminate/reduce basement flooding during significant rain events. The general locations are shown in Figure 2-4 and described below:

- Mt. Vernon Avenue between Charleviox Avenue and Chalfonte Avenue
- McMillian Road between Ridge Road and Chalfonte Avenue
- McKinley Avenue between Beaupre Avenue and Chalfonte Avenue

Mt. Vernon Avenue

Mt. Vernon Avenue is a residential street that consists of a 24-foot wide asphalt road with concrete curb and gutter generally centered within a 60-foot right of way and is lined by mature trees on both sides within the greenbelt.

The properties along this road are serviced by a 15- to 18-inch combined sewer within the right of way on the south side of the road (just north of the existing sidewalk). There is also an existing 6-inch water main within the right of way on the south side of the road.

The existing combined sewer will remain in service as the sanitary sewer servicing the residents on this road. A new storm sewer, ranging in size from 12- to 24-inch, will be installed within the existing right of way. The proposed location is the north half of the road (under the pavement) to avoid damage to the existing mature trees within the green belt. The new storm sewer will be connected to the existing sewer on Chalfonte Avenue. Depending on the final design and location of the new storm sewer, partial reconstruction (area disturbed by the sewer installation) and milling and overlaying of the remaining portion of the road may be warranted.

McMillian Road

McMillian Road is a residential street that consists of a 24-foot wide asphalt road with concrete curb and gutter generally centered within a 55-foot right of way and is lined by mature trees on both sides of the road within the green belt.

There are two (2) combined sewers within the road right of way; a 21- to 42-inch sewer on the northeast side of the road and a 12- to 15-inch sewer on the southwest side of the road. There is also an existing 6-inch water main on the southwest side of the road.

The existing sewers will remain in service as the sanitary sewer servicing the residents on this road. A new storm sewer, ranging in size from 12- to 36-inch will be installed within the right of way between the two existing combined sewers (under the pavement). Depending on the final design and location of the new storm sewer, partial reconstruction (area disturbed by the sewer installation) and milling and overlaying of the remaining portion of the road may be warranted.

McKinley Avenue

McKinley Avenue is a residential street that consists of a 24-foot wide asphalt road with concrete curb and gutter generally centered within a 60-foot right of way and is lined by mature trees on both sides of the road within the green belt.

The properties along this road are serviced by a 24-inch combined sewer located on the south half of the road and a 6-inch water main located within the green belt just south of the north right of way line.

The existing 24-inch combined sewer will remain in service as the sanitary sewer servicing the residents on this road. A new storm sewer will be installed within the existing right of way, between the existing combined sewer and water main (under the pavement). Depending on the final design and location of the new storm sewer, partial reconstruction (area disturbed by the sewer installation) and milling and overlaying of the remaining portion of the road may be warranted.

The total cost for these Sewer Separation projects are $39,465,000 as listed in Appendix G under the Engineer's Opinion of Probable Cost Summary. A partial breakdown is provided in Table 3-1.

Table 3-1. Selective Alternative Cost Breakdown

Project	Cost
New Force Main & Gravity Sewer	$10,225,000
New Storm Pump Station	$17,070,000
Partial Separation South End & Complete Separation – NW/NE Quad	$12,170,000
TOTAL	**$39,465,000**

Construction Considerations

The proposed improvements would involve the construction of new storm sewers, storm water pump station, storm water forcemain and gravity sewer. The new sewers would be within established right-of-ways (ROWs), the pump station within a City owned parcel and the forcemain within an easement through an existing golf course (CCD).

Improvements in the Wayne County ROW would require the City to notify Wayne County of improvement efforts. Additional maintenance of land would not be required as no additional land is being acquired. Obtaining temporary/permanent easements or access agreements may be required in limited areas and will be determined during the design phase.

3.2 ALTERNATIVE 2 – STORM WATER DETENTION BASIN & SEWER SEPARATION

This alternative consists of the following components:

- Constructing a new storm water detention basin next to the Kerby Road Sewage Pumping Station (KRSPS) which is located at the corner of Kerby Road and Chalfonte Avenue and dewater to the KRSPS.
- Removing storm flows from the NW Quad from the City's combined sewer system (localized separation by constructing new storm sewer west of Chalfonte Avenue and north of Moross Road).
- Removing storm flows from the NE Quad from the City's combined sewer system (localized separation). This area includes the west side of the CCD, the west half of Provencal Road and Moross Road between Beaupre Avenue and Chalfonte Avenue.
- Partial separation of the combined sewer east of Chalfonte Avenue along Mt. Vernon Avenue, McMillan Road and McKinley Avenue with the construction of new storm sewers that will discharge into the Chalfonte Interceptor.

This alternative is similar to Alternative No. 1 with the difference being a storm water detention basin is proposed in lieu of the storm water pump station, storm water force main and gravity sewer. The scope of the sewer separation is the same as Alternative No. 1.

The proposed basin would need to have a minimum volume of 3.3 MG (10-year, 1-hour design event) and upwards of 9.1 MG (based on recent significant rain events). It is envisioned that the basin would be approximately 220' x 220' x 18' for the 10-year, 1-hour design and approximately 350' x 350' x 18' for the significant rain events. The potential location is adjacent to the KRSPS given the open space and proximity to the KRSPS. This location would facilitate basin dewatering and provide an adequate location for surface flooding should the basin overloaded.

3.3 ALTERNATIVE 3 – NO ACTION

If no action is taken with the wastewater collection system, large areas of the City, especially in the Inland District will continue to be subjected to potential basement flooding during the design events. Therefore, no action is not a feasible alternative.

3.4 ALTERNATIVE 4 – REGIONALIZATION

The regionalization alternative would involve piping the wastewater to a facility with enough spare capacity to accommodate the flow. The closest facilities to the City that would/may have enough spare capacity would be Warren Wastewater Treatment Plant or GLWA Water Resource Recovery Facility. Sending flow from the City to

either of these plants would require the construction of over 10 miles of forcemain and multiple large pumping stations. Acquiring the approval for the forcemain would be time consuming and likely delay the project by several years. A tremendous amount of energy would be consumed by the pumping stations alone.

3.5 ALTERNATIVES ANALYSIS

The principal alternatives that will be considered for this analysis are:

- Sewer Separation Projects
- Storm Water Retention Basin & Sewer Separation

3.5.1 COST-BENEFIT ANALYSIS

Monetary Evaluation

A preliminary cost estimate has been prepared for both the "Sewer Separation Projects" and the "Storm Water Retention Basin & Sewer Separation" alternatives discussed above. The "No Action" and "Regional" alternatives were not part of the monetary evaluation due to lack of feasibility.

Escalation costs were not included in this monetary evaluation. The majority of the work will be completed within the road ROWs or existing easements. Any new easements that are necessary will be temporary and will vary based on the selected alternative.

The present worth of the construction cost within the project period of 20 years is determined by using the formula provided below:

$$\text{Present Worth} = \frac{F}{(1+i)^n}$$

where, F – future value/estimated project cost

n – number of years

I – EPA discount rate (0.02)

The OM&R costs throughout the project period of 20 years are determined by using the formula provided below:

$$\text{Present Worth} = A * [\,(1+i)^n - \frac{1}{i(1+i)^n}\,]$$

where, A – annual expenditure

n – number of years

i – EPA discount rate (0.02)

As indicated by the CWSRF guidance document, the salvage value has been calculated based on in-place construction cost with straight-line depreciation over the estimated design life. For newly constructed pipelines, a design life of 100 years has been estimated based on manufacturer certifications for pipeline performance and testing results.

Appendix G details the present worth analysis taking into consideration interest during construction and salvage value, considering the EPA discount rate. The cost estimation also includes the operation, maintenance, and

replacement costs for the improvements, covering a period of 20 years. Table 3-2 provides a summary of the monetary evaluation for the two (2) alternatives.

Table 3-2. Monetary Evaluation Summary

Alternative	CWSRF Loan Amount	Interest During Construction	20-Year Values		
			OM&R Costs	Salvage Value	Net-Present Worth
Sewer Separation Projects	$39,465,000	$1,480,000	$135,000	$26,180,000	$16,135,000
Storm Water Retention Basin & Sewer Separation	$61,670,000*	$2,310,000	$135,000	$40,900,000	$23,610,000

* Cost assumed $15 per gallon for the basin construction ($49,500.000) plus the cost for the Partial Separation South End and Complete Separation of the NW/NE Quad ($12,170,000 from Alternative 1).

Based on net present worth costs, the Sewer Separation Projects (Alternative 1) option provide the better long-term value and are considered the favorable alternatives.

Staging Construction

Both alternatives require inspection, evaluation, design phases, and implementation phases. Similarly, both alternatives require extensive amounts of work at various locations (sewer separation) as well as large excavations for the pump station or retention basin. Both alternatives will be planned in stages in order to completed without increased social impacts.

Partitioning the Project

The selected alternative consists of several components and is proposed to be constructed in a phased approach to minimize disruption to the community. The following is an example of the potential phasing:

- Phase I – Forcemain, Transition Structure, Gravity Sewer, and Outfall Structure
- Phase II – Pump Station
- Phase III – Sewer Separations (NW/NE Quad and South End)

All phases could be built at the same time; however, this approach will be a significant construction administration effort. The northern portion of the City will experience significant disruption with all of the construction being performed during the same timeframe. In addition, Phase III could be broken into several smaller contracts to allow for more smaller local contractors to bid on the projects, if desired. This option would also allow the work to be completed sooner by making the project scope for each separated area smaller and using different contractors to work on each contract simultaneously.

Environmental Evaluation

The expected environmental impacts of the proposed alternatives, especially the pump station and combined storage will be similar in nature. However, the "Combined Storage" would require the disturbance of a larger footprint than the pump station. In addition, the "Sewer Separation" will require construction on multiple residential streets.

Proper traffic control, soil erosion and sedimentation control, and odor control measures, mitigate impacts to the general public.

These phases will also include the ongoing infrastructure improvements already planned in the areas of these phases to coordinate and minimize disruption and improve overall costs.

The social impacts generated by the lengthier construction duration for the "Sewer Separation" alternative is the only major impact that differs significantly with the "Storm Water Retention Basin & Sewer Separation" alternative. These social impacts are difficult to measure monetarily but will be considered when choosing the selected alternative should the monetary evaluation be relatively equal.

Implementability & Public Participation

The public was provided with a 15-day Draft Project Plan review period as well as a public hearing in accordance with the guidelines set forth in the CWSRF guidance documents on the EGLE website. This provided the public with an opportunity to comment on the Project Plan before it was finalized. The need for the project is well-described within this Project Plan; there should be minimal issue implementing the selected alternative.

3.5.2 CONCLUSIONS

Alternative 1 (Sewer Separation Projects) is the only feasible alternative that will reduce the occurrence of basement flooding and reduce/eliminate CSOs (for the design event), increase the level of service within the sanitary sewer collection system making the system more resilient to impacts from wet weather events that exceed the design event, and improves water quality to Lake St. Clair as the City will be able to convey, and store events larger than the design event before discharging to the Lake.

SECTION 4.0 — SELECTED ALTERNATIVES

4.1 PROPOSED FACILITIES

The proposed project consists of all improvements described previously under Alternative 1.

4.2 SCHEDULE

Table 4-1 provides a proposed schedule for the project.

Table 4-1. Proposed Design and Construction Schedule

Engineering Service		Timeframe
New Storm Water Force Main & Gravity Sewer	Design	May 2023 – January 2024
	Construction Start	November 2024
	Construction End	November 2025
New Storm Pump Station	Design	May 2023 – March 2024
	Construction Start	June 2024
	Construction End	June 2026
Partial Sewer Separation (South end)	Design	July 2023 – May 2024
	Construction Start	September 2024
	Construction End	October 2026
Complete Separation (NW/NE Quad & Westside of CCD)	Design	July 2023 – May 2024
	Construction Start	September 2024
	Construction End	October 2026

4.3 COST ESTIMATE

The estimated 2023 total project cost for the proposed project is $39,465,000. A cost summary for the wastewater collection system improvements and a detailed opinion of probable project cost for the New Storm Water Pump Station as well as the Forcemain and Gravity Sewer are both shown in Appendix G.

4.4 USER COSTS AND COST SHARING

The City of Grosse Pointe Farms supplies metered water to its approximately 4,125 water customers. The City rates are set up where each resident is charged a minimum of $70.20 per month for water and sewer (0-700 cubic

feet of usage). There is an additional charge for each additional 100 cubic feet used ($10.36 x usage). For the purposes of determining user cost per REU, the minimum charge was used.

The 'Meter Size' method was initially used to determine residential equivalent units (REUs) for the City. The majority of the City's water meters are 3/4-inch; therefore, the capacity of all meters within the City were converted to the capacity of 3/4-inch meters to obtain an initial total REUs for the City of 7,348 (refer to Table 4-2).

Table 4-2. Water Meter Sizes, Quantities and REU's in System

Meter Size (inch)	Total	REU's In System (3/4-inch meter conversion)
5/8	20	13
¾	2,222	2,222
1	1,089	1,819
1 ½	595	1,981
2	165	879
3	25	250
4	7	117
6	2	67
Totals	**4,125**	**7,348**

However, as the City does not separate out irrigation meters, it is estimated that the REU count in Table 4-2 would skew the user costs. Give that the City is 90% residential and 10% non-residential, the final REUs were calculated by assuming 90% of the meters (3,713) plus 10% of the REU count in Table 4-2 (734) for a total REU count of 4,447.

The average monthly impact to the average user for the proposed (estimated $39,465,000) project is listed in Table 4-3.

Table 4-3. User Cost per Residential Equivalent Unit

Funding Source	Current Cost/ Month (2022)	Cost Increment/ Month	New Total Cost/ Month
CWSRF Funding @ 1.875%	$70.21	$44.69	$114.90

As indicated, the user costs are calculated using and interest rate of 1.875% for CWSRF funding and are based on a 20-year loan period and 4,447 REUs. The costs in Table 4-3 are applicable to the average user. Billing to multiple resident dwellings (e.g. apartment buildings) and non-residential users will vary.

SECTION 5.0 — ENVIRONMENTAL IMPACTS

5.1 GENERAL

The anticipated environmental impacts resulting from the construction of the selected plan include beneficial & adverse, short- and long-term, and irreversible impacts. The following is a discussion of the environmental impacts of the selected plan.

5.1.1 BENEFICAL AND ADVERSE IMPACTS

The City of Grosse Pointe Farms will be constructing a storm water pump station, a force main and a gravity sewer that discharges to Lake St. Clair, as well as the NW/NE Quad separation and partial separation in the south end. With these changes in the system, it will significantly reduce the occurrence of basement flooding for the design event.

The construction that will take place in the northern end of the City would reduce the flow by approximately 31% to the KRSPS. It will also help mitigate flooding in the remaining areas of the Inland District due to the separation of the storm water that will be discharged to Lake St. Clair. This will free up the sewer and pump capacity in the remaining combined areas to utilize. The benefits will also apply to the regional collection system as well as the neighboring communities. When completed, these projects will reduce the peak flow rate and total volume of storm water in the Inland Districts combined sewer system, thereby reducing the potential for flooding during the design event. All new storm sewers, the new force main, and the new storm water pump station will be designed to have the capacity required for the 10-year 1-hour storm event and meet all EGLE requirements.

5.1.2 SHORT-TERM AND LONG-TERM IMPACTS

The primary short-term adverse impacts of the proposed project are similar to any construction project. These include noise, dust, traffic disruption, and soil erosion. The short-term negative effects will be surpassed by the long-term beneficial impacts resulting from the implementation of this Project Plan.

The proposed construction will consist of open cuts to install the new piping, pump station and pump station housing. The long-term positive impacts include the separation of sanitary and storm flow. This will reduce flows to the KRSPS by 102 cfs for the design event.

5.1.3 IRREVERSIBLE IMPACTS

The investment in non-recoverable resources committed to the Project Plan would be traded off for the improved performance of the facilities during the life of the system. The commitment of resources includes public capital, energy, labor, and unsalvageable materials. These non-recoverable resources would be foregone for the provision of the proposed improvements.

Construction accidents associated with this project may cause irreversible bodily injuries or death. Accidents may also cause damage to or destruction of equipment and other resources.

5.2 ANALYSIS OF IMPACTS

5.2.1 DIRECT IMPACTS

Local Air Quality

There will be minimal direct impacts on local air quality during the construction phases of these projects. Any effects on air quality will be due to dust and emissions from construction equipment.

Archeological, Historical or Cultural Resources

There are no impacts on archaeological, tribal, or cultural resources due to this project. However, there are two (2) historical places that are within the vicinity of the project areas. The State Historic Preservation Office (SHPO) and the Tribal Historic Preservation Offices (THPO) will be coordinating official impact reviews with for final determination of historic properties impacted.

Land Use Restriction & Environmental Management

There are no anticipated impacts on any land use restrictions or environmental management sites. The location of the new pump station will be built on a field of unused land; therefore, this pump station will not have impacts on the existing land use. The new force main will traverse on existing golf course (CCD), therefore a temporary restriction of usage may be required depending on the timing of the project. The CCD is aware of this possibility and the City will work with the CCD in order to minimize any disruption. All other improvements will occur within existing right-of-ways.

Impacts Upon the Existing or Future Quality of Local Groundwater and Surface Waters

Construction will occur within a community recreational district as well as a residential district. The ground water and surface water will not be negatively impacted. The surface water will be positively impacted due to the sewer separation causing the storm water to discharge into Lake St. Clair and decreasing the occurrence of a CSO for the design event.

Impacts Upon Sensitive Features

The project areas are within CCD as well as residential areas. The area within CCD contains a wide variety of tree and shrub species, interspersed with well-maintained lawn areas. There are no floodplain or wetland areas within the project footprint. There is a minimal number of trees and bushes located at the new pump station site, and they should not be affected during construction. If for any reason the existing trees or bushes are to be affected during the construction, they will be removed prior to construction and planted in a new location during the restoration phase.

Impacts Upon People and The Local Economy

Short-term impacts to people will occur during the construction phase. Increased construction traffic and possible temporary road closures will occur in the localized area of the proposed pump station and sanitary sewer separation. All of the City of Grosse Pointe Farms sanitary sewer users will experience beneficial long-term impacts due to the reduced occurrence of basement flooding for the design event.

The local economy will be stimulated by contractors and suppliers of the materials, labor, and equipment necessary to construct the project.

Operational Impacts

The proposed project will improve the Inland Sewer District through sewer separation that will mitigate flooding in the combined areas for the design event. This project will benefit the regional collection system as well as the neighboring communities.

5.2.2 INDIRECT IMPACTS

Changes in Rate, Density, Or Type of Residential, Commercial, or Industrial Development and the Associated Transportation Changes

No changes are anticipated to the above.

Changes in Land Use

In the northeast corner of Chalfonte Avenue and Moross Road, will be a newly installed pump station and pump station housing that will match the City's building aesthetic in that area. The land was previously a residential parcel, but it is now owned by the City. The open space area has small trees and shrubs that line along the roadside that will not be affected during construction. If needed, the shrubs and trees will be removed and relocated. There are no floodplains, wetlands or historical land associated with the chosen location for the new pump station. Due to the proposed pump station housing, the aesthetic should not be affected and will be designed to blend in with the surrounding residential homes.

Changes in Air or Water Quality Due to Facilitated Development

There will be no changes to air quality due to development. As for water quality, the proposed sewer separation will discharge the storm water to Lake St. Clair reducing combined sewer basement flooding and decreasing the flow to the KRSPS.

Changes to The Natural Setting or Sensitive Features Resulting from Secondary Growth

There should be no changes to the natural setting or sensitive features resulting from secondary growth.

Impacts on Cultural, Human, Social and Economic Resources

No changes are anticipated to the above.

Impacts of Area Aesthetics

The proposed construction work pertaining to the pump station will be enclosed by a cape cod style pump station house in order to match the existing aesthetics within the City's residential neighborhood in the area. The rest of the sewer separation work will not impact the aesthetics as restoration to match the existing site will be completed as part of the construction project.

Resource Consumption Over the Useful Life of the Treatment Works, Especially the Generation of Solid Wastes

No changes are anticipated to the above.

5.2.3 CUMULATIVE IMPACTS

Siltation

Siltation may occur during the construction phase of the project. Proper soil erosion and sedimentation control practices will be followed to reduce the impacts of siltation on surrounding areas.

Water Quality Impacts from Direct Discharges and Non-Point Sources

The proposed work will have a positive impact on the water quality of the surrounding area because this project will be decreasing the amount of peak flow discharge from the City's sewer system.

Indirect Impacts from Development

The development of the pump station housing should not have any indirect impact.

The Impacts from Multiple Public Works Projects Occurring in the Same Vicinity

There will only be short-term traffic impacts during the construction phase of this project and proper traffic control measures will be followed.

SECTION 6.0 — MITIGATION

6.1 SHORT-TERM, CONSTRUCTION-RELATED MITIGATION

Mitigation techniques used to minimize construction impacts would be standard procedures included in construction contracts. Guidelines will be established for cover vegetation removal, dust control, traffic control and accident prevention. Once construction is completed those short-term effects would gradually cease and the area would be returned, to the original conditions as possible. The trees and bushes in the construction areas would be removed and relocated.

Construction traffic will have a short-term impact on all aspects of construction relating to installing the new sewers. To the largest extent possible, traffic would be limited to major streets, and routed away from residential areas. Worker shifts would be scheduled to avoid peak traffic flow periods.

The Michigan Occupational Safety and Health Administration (MIOSHA) has strict standards that must be followed for noise control on work sites. Noise control would be primarily achieved on the site through proper equipment maintenance and scheduling of work to eliminate the need for several loud pieces of machinery to run simultaneously. During construction, sites would be maintained to minimize the aesthetic impacts on the neighborhood. Litter would be collected regularly.

Soil erosion impacts will be mitigated through the Contractor's required compliance with a program of soil erosion and sedimentation control measures as specified in Part 91 of Michigan Act 451, P.A. of 1994. Surface temporary impacts will be mitigated by strict conformance to City mandated traffic control, noise restrictions, and limited hours of operation. EGLE would also review design plans to ensure compliance with Part 91 of Michigan Act 451, P.A. of 1994.

Construction equipment will be maintained in good condition to decrease noise. All access roads will be swept as necessary to avoid tracking sediment onto public roads.

6.2 MITIGATION OF LONG-TERM IMPACTS

Mitigation of long-term impact to the natural environment can be accomplished by the restoration of the affected areas once the sewer separation, new pump station, and force main/gravity outlet sewer are completed. This can be accomplished by the preservation of the topsoil on site and a return to the same approximate slope and orientation where construction occurs in lawn areas. The new pump station will be housed with a cape cod style exterior to keep the City's aesthetic.

There will be no negative long-term impacts due to the construction, sewer separation, the installation of the new pump station, and force main/gravity sewer outlet to the lake. Any trees or shrubs that will need to be removed due to construction, will be relocated and planted.

6.3 MITIGATION OF INDIRECT IMPACTS

Wildlife populations that inhabit the immediate construction areas may flee from the increased traffic, noise, fumes, and dust typical to construction activity. This may result in the temporary displacement of some species from the area which may then impact the aesthetics and natural setting. In general, however, short-term impacts will be

direct in nature. The aesthetics of the project area will be restored after the construction is completed. This project will help eliminate health hazards from basement flooding and will reduce the volume of storm water in the Inland Districts combined sewer system for the design event.

SECTION 7.0 — PUBLIC PARTICIPATION

7.1 GENERAL

The Project Plan was advertised/posted on the City's website (www.grossepointefarms.org), on March 24, 2023 (refer to Appendix I for all public participation documentation.) A copy of the Project Plan was placed at the following location for review:

- **City Hall** – Grosse Pointe Farms City Hall located at 90 Kerby Road, Grosse Pointe Farms, Michigan 48236, 313-885-6600

A public meeting will be held at the City Hall to review the work associated with the proposed Project Plan. The meeting will review the information presented in the Project Plan, including estimated user costs and to receive comments and views of interested persons. Copies of correspondence related to agency notifications, as well as other relevant correspondence, is included in Appendix B.

7.2 RESOLUTION

The City Council will present a formal resolution regarding this Plan during the public meeting. The resolution is included in Appendix I.

7.3 PUBLIC MEETING DOCUMENTATION

Appendix I includes a sign-in list, the Project Plan signed resolution, a meeting summary, and a copy of the slides presented at the meeting.

7.4 ADDITIONAL EGLE SUBMITTAL FORMS

Appendix J will include the following EGLE Submittal Forms:

- The signed Project Plan Submittal Form
- The signed Project Useful Life and Cost Analysis Certification Form
- The Project Priority List (PPL) Scoring Data Form

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Appendix A — Sewer System Evaluation Report

(Executive Summary Only)

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REPORT

FOR

Sewer System Evaluation

FOR

City of Grosse Pointe Farms, Wayne County

City of Grosse Pointe Farms

Final
August 2020

Prepared by:

HUBBELL, ROTH & CLARK, INC.
Consulting Engineers
555 Hulet Drive • P.O. Box 824
Bloomfield Hills, MI 48303-0824

DRAFT

Acknowledgements

Sewer System Evaluation

City of Grosse Pointe Farms

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Mr. Terry Brennan, Former Director of Public Service and Staff

DRAFT

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List of Abbreviations

Abbreviation	Meaning
2016 Event	Significant event that occurred between July 6, 2016 and July 8, 2016
ac	Acre
CB	Catch Basin
CCD	County Club of Detroit
cfs	Cubic Feet Per Second
CSO	Combined Sewer Overflow
CSRB	Combined Sewer Retention Basin
DPS	Department of Public Service
DPW	Department of Public Works
DWF	Dry Weather Flow
DWI	Dry Weather Infiltration
EFSDS	Evergreen-Farmington Sewage Disposal System
EPA	Environmental Protection Agency
FCE	Fox Creek Enclosure
FD	Footing Drain
ft	Feet
g/in-mi/d	Gallons per inch-mile of pipe per day
GIS	Geographic Information System
GLWA	Great Lakes Water Authority
gpcd	Gallons per capita per day
GPF	Grosse Pointe Farms
GPHC	Grosse Pointe Hunt Club
gpm	Gallons per minute
GPW	Grosse Pointe Woods
HGL	Hydraulic Grade Line
HRC	Hubbell, Roth & Clark, Inc.
I/I	infiltration/inflow
in	Inch
in/hr	Inches per hour
KPS	Kerby Road Pumping Station (Owned by Wayne County)
KRSPS	Kerby Road Sewage Pumping Station (Owned by the City)
LID	Low Impact Development
MG	Million gallons
MGD	Million Gallons Per Day
mi	Mile
NE	Northeast
NESDS	Northeast Sewage Disposal System
NOAA	National Oceanic and Atmospheric Administration
NW	Northwest
O&M	Operations and Maintenance
pop	Population

Abbreviation	Meaning
RDII	Rainfall Dependent Infiltration and Inflow
ROW	Right-of-Way
RTK	R = % capture, T = time to peak, K = ratio of time to recede to time to peak
SCADA	Supervisory Controls and Data Acquisition
SE	Southeast
SRF	State Revolving Fund
SW	Southwest
SWMM	Storm Water Management Model
WWTP	Wastewater Treatment Plant

Section 1 - Executive Summary

The City of Grosse Pointe Farms' sanitary and storm sewers were constructed as an interconnected, combined sewer system in the 1920's. Combined sewer systems primarily convey sanitary sewage during dry weather flow, and stormwater during wet weather flows. However, as sanitary sewage is also collected during wet weather flows and there is a finite capacity of the sewer network, homes are potentially subject to an increased risk of basement flooding as rain events increase in intensity, frequency, and duration. As well, stormwater overflows, that are mixed with sanitary sewage, can lead to significant negative impacts on water quality of the receiving rivers, lakes, and streams. Therefore, in 1972, due to the passage of the Clean Water Act, combined sewer construction was no longer an acceptable practice.

In 2000, due to the frequency and magnitude of combined sewer overflows into Lake St. Clair, as well as basement flooding, the City undertook a sewer separation program to convert the existing combined sewer system into a separate sanitary sewer system and constructed a new storm sewer system for the area generally east of Ridge Road. Ridge Road is aptly named as this road is along a ridgeline whereby the area east of Ridge is sloped towards Lake St. Clair and the area west of Ridge is sloped towards Chalfonte Road. Therefore, in the 2000s, an extremely impactful and cost-effective solution was to separate the combined area next to the lake such that stormwater runoff collected from road drainage could be easily conveyed and discharged directly to the lake. This separation project was tremendously successful in reducing combined sewer overflows into Lake St. Clair and reducing the occurrence of basement flooding within the area east of Ridge Road. This separated area is known as the Lakeside District whereas the area generally west of Ridge Road is known as the Inland District. Given the topography of the area, the sewers in the Inland District remains a combined sewer system today.

In 2011, street and basement flooding were recorded during two (2) events on May 25, 2011 and September 10, 2011. During both events, extensive surface and basement flooding occurred throughout the Inland District. A hydrologic and hydraulic computer model of the Inland District was created as part of the analysis of the 2011 events.

Five years after the 2011 events, a significant rain event occurred in the City of Grosse Pointe Farms between July 6, 2016 and July 8, 2016. During this period 4.02 inches of precipitation was recorded, with a peak intensity of 2.50 inches in one (1) hour. Basement flooding occurred primarily throughout the

Inland District; however, in many areas, the cause of basement flooding varied and included issues such as individual private sewer lead conditions such as damaged or blocked pipe due to roots, calcium or debris, or local sewer capacity issues.

Therefore, the purpose of this study was to determine the most impactful and practical solution that will remove storm flows from the system and minimize the potential for basement flooding within the Inland District. This was accomplished by updating the computer model which was achieved through significant data collection, including nine (9) months of sanitary and combined sewer meter data (14 meter installed and collected data between March and December 2017), survey data, system data and field reconnaissance.

1.1 Lakeside District Meter Data Results

The meter data was used to determine dry weather flows, wet weather flows for the purpose of calibrating a computer model and to determine the 10-year, 1-hour rainfall dependent infiltration/inflow (RDII) within the separated Lakeside District. The meter results for the Lakeside District are listed in Table 1-1 and are shown in Figure 1-1 (all figures follow the end of each section). The results indicate that the entire Lakeside District is contributing excessive RDII to the system. The 10-year, 1-hour projected peak flow was unitized by population and number of parcels resulting in estimated flow per capita and per footing drain. The Environmental Protection Agency (EPA) has defined, for a separate sanitary sewer system, that inflow is excessive if wet weather flows are greater than 275 gallons per capita per day (gpcd). As well, wet weather footing drain flows are typically between 3 and 5 gallons per minute (gpm). It can be seen from Table 1-1 that all Lakeside Districts exceed the 275 gpcd and all exceed 5 gpm per footing drain.

Table 1-1: Lakeside District Meter Results (For Individual Meter Districts[3])

Meter Name	10-Year, 1-Hour Projected Peak Flow (mgd)	Approx. Population	Approx. Number of Footing Drains (parcels)	10-Year, 1-Hour Project Peak Flow per Person (gpcd) [1]	10-Year, 1-Hour Projected Peak Flow per Footing Drain (gpm/FD)[2]
M03 - Provencal East	4.86	122	48	39,861	70
M10 - Lake Shore North	2.10	630	248	3,335	6
M11 - Lake Shore Kerby	2.04	264	104	7,737	14
M12 - Moran	5.76	698	275	8,252	15
M13 - Lake Shore South	4.45	1,388	546	3,206	6
M14 - Hunt Club	0.65	23	1	28,736	451

[1] Flows greater than 275 gpcd are considered excessive

[2] Footing drain flows are typically between 3 and 5 gpm / FD

[3] Individual meter districts mean upstream meters/districts have been subtracted

The unitized values for M14 – Hunt Club are as expected as the tributary area is combined. It has been discussed with City Staff that the current owners of the Hunt Club property intend to separate their sewers; it is recommended to ensure the sewer separation occurs in a timely manner.

The excessively high values for the remaining Lakeside Districts likely indicate one or more storm sewer cross-connections. Excess flows from a storm sewer cross-connection could be from a connected catch basin, a directly connected storm sewer, or even highwater emergency overflow gates that have either been bulkheaded and the bulkhead has failed, or an active overflow gate that is not providing a water-tight seal and water from the lake is backing up into the system. In the case of M03 – Provencal East, the east side of Country Club of Detroit (CCD) Golf Course is tributary to this meter and it may be possible that golf course stormwater drainage is connected and/or there is a storm sewer cross-connection outside the golf course.

In addition to the excess wet weather inflow, the Lakeside District is contributing excessive dry weather infiltration. This condition is currently exacerbated as the water level in Lake St. Clair is at a record high. Higher lake levels result in a higher groundwater table which could result in an increase in hydrostatic pressure on the sanitary sewer system whereby groundwater flows are entering the sewer system, via cracks in pipes and manholes, under an increase in pressure.

Therefore, it is recommended to perform detailed field investigations throughout the Lakeside District (including within CCD) that include activities such as: smoke testing, manhole inspections, sewer televising, dye testing where necessary, and investigations at all the bulkheaded and active overflow gates.

Field investigations in the Lakeside District will also assist in evaluating the sewer condition. The sanitary sewer in the Lakeside District is the previously combined sewer and is nearly 100 years old. Sewer systems deteriorate with age and inspection of the Lakeside sewers is recommended to determine structural integrity of the 100-year sewer system. Many communities will clean and televise a portion of their sanitary sewer system annually such that their entire system is inspected on a 5- to 7-year cycle. This is standard practice to maintain assets in a proactive manner.

While the values listed in Table 1-1 are excessive in relation to a separate sanitary sewer system, the total projected peak flow from the Lakeside District is less than 2% of the total flow Grosse Pointe Farms is allowed to discharge into downstream system (the Fox Creek Enclosure). Therefore, in

relation to the flows generated in the Inland District, the Lakeside District flows are relatively minor. Nonetheless, further field investigations within the Lakeside District are recommended as time and funding will allow..

1.2 Model Results and Alternatives

The meter data collected within the Inland District was used to calibrate the hydrologic assumptions for the combined system. This was accomplished in an iterative manner by simulating a rain event that occurred during the monitoring period and comparing the model results against the meter results for the same rain event. Various hydrologic variables, such as rate of infiltration, theoretical catchment width, percent of pervious and impervious areas, etc., were then adjusted until model was producing peak flows and volumes within 20% of metered flows and volumes. Prior to the calibration process, the hydraulic components of the combined sewer model were reviewed and updated where necessary. Additional survey data was collected for approximately 230 manhole structures and pipe inverts and included in the model update.

The calibrated model was validated by simulating the July 2016 event and ensuring that reported basement flooding was reproduced. With an updated computer model, 13 alternatives were investigated that included sewer separation within the Inland District and/or infiltration/inflow (I/I) removal in the Lakeside District. The 13 alternatives investigated are listed in Table 1-2 which also lists the peak flow and volume reduction at the Kerby Road Pump Station, the approximate percentage of sewer surcharge/potential basement flooding elimination, and the estimated cost of each alternative.

The primary goal of each alternative was to minimize the potential for basement flooding in the Inland District (for the design event), with a secondary goal of removing stormwater flows from the system as a whole. All 13 alternatives result in a peak flow reduction within the system and 10 alternatives result in stormwater removal from the system. However, Alternative 6 provides the greatest benefit to the system by removing storm flows from the system and eliminating the recent historical reported flooding. This alternative includes partial separation of the high surcharge areas south of Moross, and complete separation of the storm flows north of Moross through the construction of new storm sewers, a storm pump station near the intersection of Chalfonte and Moross, and a stormwater force main along Moross from Chalfonte to Lake St. Clair (refer to Figure 1-2).

Table 1-2: Alternative Results Summary

#	Alternative	Description	Reduction at Kerby Pump Station[C]		Percent Reduction at Kerby Pump Station		Eliminated Reduction in Surcharging and Potential Basement Flooding[B]	Estimated Cost ($ in Million)
			Peak Flow (cfs)	Volume (MG)	Peak Flow (%)	Volume (%)		
1	1 - Lakeside District I/I Removal	I/I removal in Lakeside District, assumed through projects such as manhole and sewer rehabilitation, and removal of any storm cross-connections.	3	0.13	1%	4%	0%	Unknown[A]
2	2a - CCD Sewer Separation	Removal of storm flows from west side of CCD with the construction of new storm sewers east of Chalfonte and north of Moross, storm pump station near the corner of Moross and Chalfonte, and forcemain from pump station to Lake St. Clair.	32	0.30	9%	10%	3%	$13.3
3	2b - CCD Sewer Separation - Alt 1	Same items as Alternative 1 and 2a	32	0.40	9%	13%	3%	$13.3[A]
4	2c - CCD & NW Quadrant Sewer Separation	Same items as Alternative 2a plus new storm sewers west of Chalfonte and north of Moross	98	0.52	28%	17%	17%	$17.9 - $22.1
5	2d - CCD & NW Quadrant Sewer Separation + Alt 1	Same items as Alternative 2c plus Alternative 1	99	0.63	28%	21%	17%	$17.9 - $22.1[A]
6	2e - NW Quadrant[D] Sewer Separation	Removal of storm flows from the NW quadrant with the construction of new storm sewers west of Chalfonte and north of Moross, storm pump station near the corner of Moross and Chalfonte, and forcemain from pump station to Lake St. Clair.	53	0.18	15%	6%	14%	$14.5 - $18.2
7	2f - SW Quadrant Sewer Separation	Removal of storm flows from the SW quadrant with the construction of new storm sewers west of Chalfonte and south of Moross, storm pump station near the corner of Moross and Chalfonte, and forcemain from pump station to Lake St. Clair.	85	0.25	24%	8%	24%	$17.1 - $20.9
8	2g - SE Quadrant Sewer Separation	Removal of storm flows from the SE quadrant with the construction of new storm sewers east of Chalfonte and south of Moross, storm pump station near the corner of Moross and Chalfonte, and forcemain from pump station to Lake St. Clair.	229	0.90	66%	30%	47%	$35.9 - $44.3
9	3 - Entire Inland District Sewer Separation	Removal of storm flows throughout the Inland district with the construction of new storm sewers throughout, storm pump station near the corner of Moross and Chalfonte, and forcemain from pump station to Lake St. Clair.	309	1.72	89%	57%	100%	$50.6 - $66.4
10	4 - Stormwater Retention Basin	Removal of storm flows throughout the Inland district with the construction of new storm sewers throughout, and stormwater retention basin near the Kerby Pump Station for dewatering to Kerby.	309	-	89%	0%	100%	$18.7 - $183.0
11	5a - Combined Sewer Retention Basin	Combined sewer retention basin (CSRB) sized to remove surcharing along Chalfonte interceptor. Basin located near Kerby Pump Station for dewatering to Kerby.	10	-	3%	0%	6%	$15.0
12	5b - Combined Sewer Retention Basin with Partial Separation	CSRB sized to store excess flows with partial separation in the SE quadrant to remove surcharging from areas with historical reported basement flooding. Partial separation is along local streets with the storm flow discharging into the Chalfonte interceptor.	17	-	5%	0%	41%	$19.0
13	6 - Alternative 2e + Partial Sewer Separation South of Moross	Removal of storm flows from west side of CCD as well as removal of storm flows from the "NW Quad". Includes the construction of new storm sewers east and west of Chalfonte, north of Moross. New stormwater pump station near the corner of Moross and Chalfonte, and forcemain from pump station to Lake St. Clair. As well, local separation for high surcharge areas south of Moross with storm connection to Chalfonte interceptor	112	0.52	32%	17%	58%	$21.4 - $26.8

[A] Currently it is not possible to determine the extent of the sewer repairs without first conducting field investigations.

[B] Potential basement flooding is determined if the hydraulic grade exceeds the crown of pipe and is within 8 feet of the ground elevation.

[C] The values listed are for the 10-year, 1-hour event. The existing conditions for this event result in Kerby Pump Station peak flow of 349 cfs and volume of 3.0 MG.

[D] Quadrants are in reference to areas relative to the intersection of Moross and Chalfonte.

Therefore, the study recommendations are as follows.

1. Proceed with Phase 2 Analysis for Alternative 6

   It is recommended to investigate Alternative 6 further under a phase 2 analysis that includes present-worth calculations that factor in long-term O&M and life-cycle costs for all recommended facilities, constructability of each facility, and public acceptance.

2. Initiate the Evaluate → Investigate → Improve Process in Lakeside District

   The results of the meter study indicate that the separated Lakeside District is contributing excessive dry weather infiltration and wet weather flows. The wet weather flows are so excessive that it suggests potential storm cross-section(s) may exist within the Lakeside District. The evaluate → investigate → improve process is, in general, an ongoing process of evaluating the system using meters, then investigating the priority areas identified from the meter data with field investigations such as manhole inspections, smoke testing, dye testing, sewer televising, and downspout survey. These types of investigations will identify the location and type of improvement necessary to remove excess flow from the system. Typical system improvements are: manhole rehabilitation, sanitary sewer rehabilitation, illicit stormwater disconnection (if any), and downspout disconnection (if any). While the total excess flow in the Lakeside District is less than 2% of the flow generated by the Inland District, it is recommended to initiate the evaluate → investigate → improve process in the Lakeside District by allocating at least $500,000 annually for the foreseeable future, or with as much annual funding that is socially acceptable to the City. Additionally, continuous evaluation of the sewer condition, on a 5-year to 7-year cycle, is standard practice in maintain assets in a proactive manner.

3. Investigate Outfall Bulkheads and Gates

   There are seven (7) outfalls from the Lakeside District to Lake St. Clair. Four (4) of the outfalls are bulkheaded and three (3) are controlled with a mechanically controlled gate. Over time it is possible the bulkheads and seals around the mechanically controlled gates can deteriorate thereby allowing lake water to infiltrate the sewer system. This condition can be exacerbated if the lake levels are higher than normal. Therefore, it is recommended to check the bulkheads and seals around the mechanically controlled gates on a routine basis to maintain a watertight seal.

4. Encourage County Club of Detroit (CCD) Stormwater Storage Basin

   The CCD is considering constructing an onsite stormwater storage basin to capture stormwater runoff in order to use the collected stormwater for irrigation. Any reduction in peak flow and volume from the system would be beneficial to the existing combined system and/or the proposed separated storm system. Therefore, it is recommended to encourage CCD to construct this onsite storage facility thereby removing stormwater flows from the system.

5. Ensure Hunt Club Disconnection

   The Grosse Pointe Hunt Club (GPHC), located in Grosse Pointe Woods (GPW), is connected to the City's sanitary sewer system in the Lakeside District. The owner of the GPHC is planning on disconnecting the Hunt Club from the City's sewer system. Their intent is to either connect their separated storm to Grosse Pointe Farm's storm sewer on Provencal and connect the sanitary to the GPW's sewer system, or to connect both separated storm and sanitary to the Farms separated sewers on Provencal. It is recommended that the City ensure the disconnection of stormwater from the sanitary system occurs in a timely manner.

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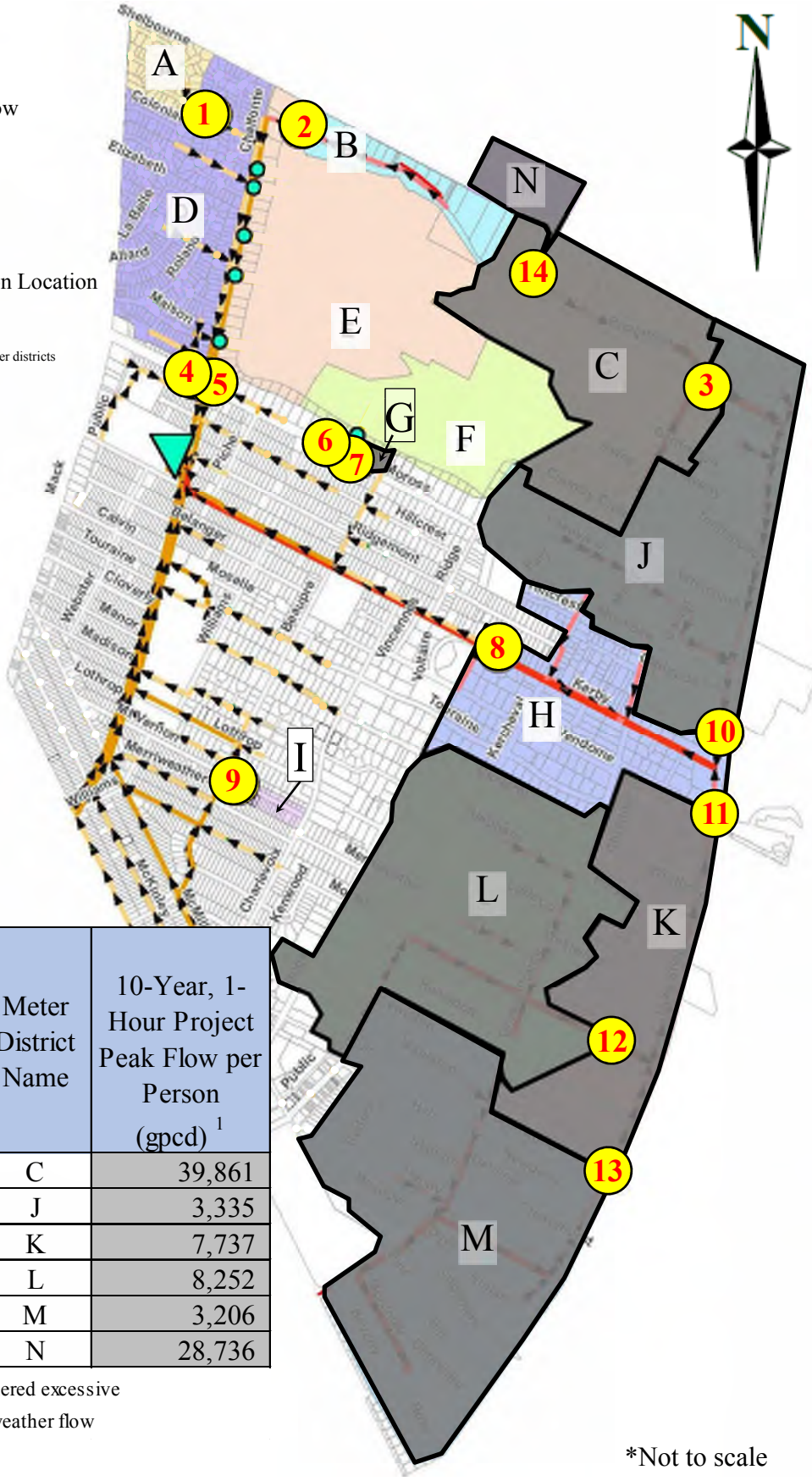
Legend

- Excessive Wet Weather Flow
- Meter Locations
- Rain Gage and Pump Station Location

Note: the other colored areas denote other meter districts



Meter Name	Meter District Name	10-Year, 1-Hour Project Peak Flow per Person (gpcd) [1]
M03 - Provencal East	C	39,861
M10 - Lake Shore North	J	3,335
M11 - Lake Shore Kerby	K	7,737
M12 - Moran	L	8,252
M13 - Lake Shore South	M	3,206
M14 - Hunt Club	N	28,736

[1] Flows greater than 275 gpcd are considered excessive

* Shaded cells indicated excessive wet weather flow

*Not to scale

HRC

City Grosse Pointe Farms – Sewer System Evaluation

Districts with Excessive Wet Weather Flow

Job No. 20160696

Date October 2018

Figure No. 1-1

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Y:\20160\20160696\03_Studies\Working\Report\Figures\Intermediate\PowerPoint\20180523_Portrait.pptx

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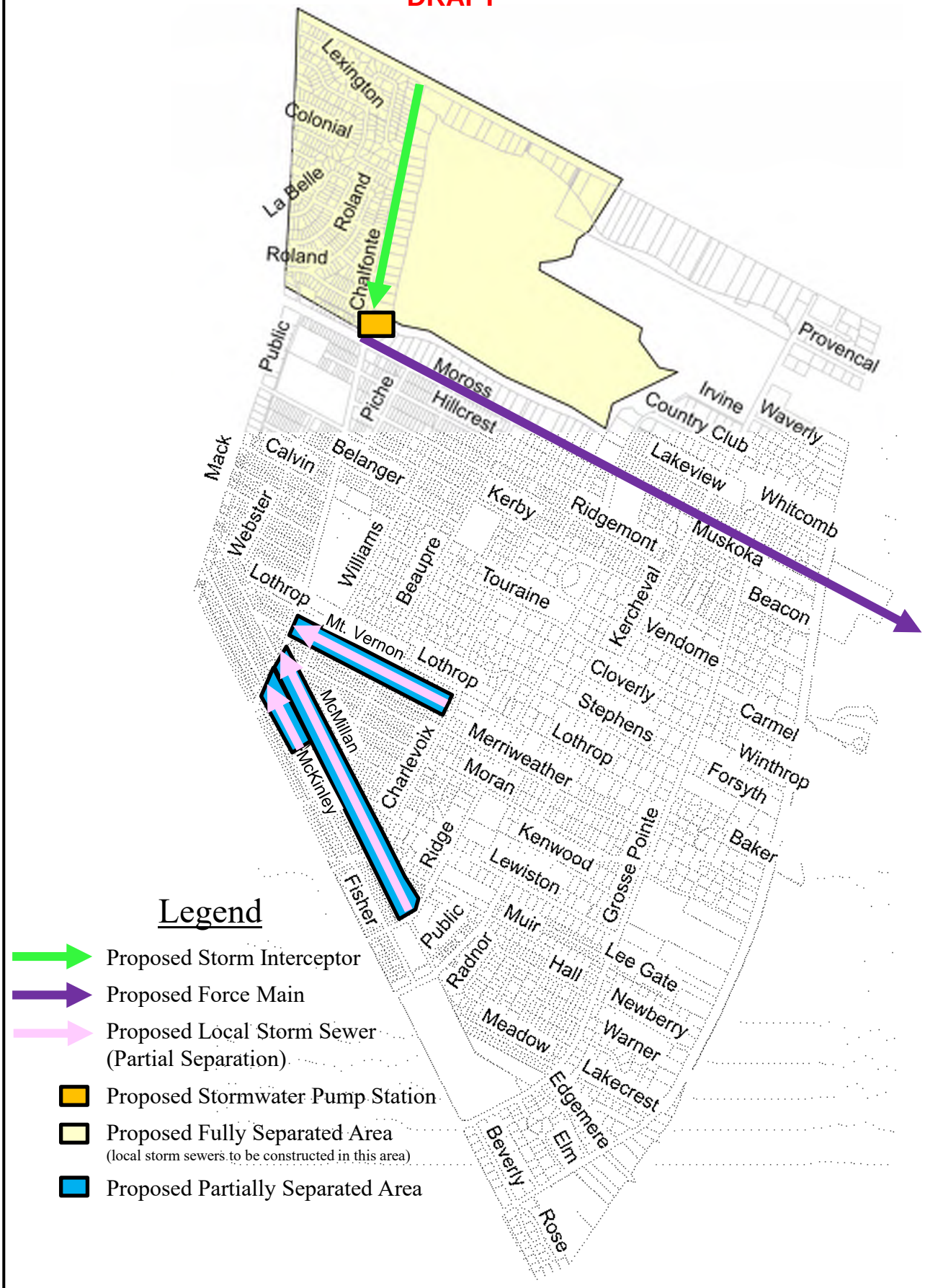

Legend

- Proposed Storm Interceptor
- Proposed Force Main
- Proposed Local Storm Sewer (Partial Separation)
- Proposed Stormwater Pump Station
- Proposed Fully Separated Area (local storm sewers to be constructed in this area)
- Proposed Partially Separated Area

HRC	City Grosse Pointe Farms – Sewer System Evaluation	Job No. 20160696
	Alternative 6 – Alternative 2c + Partial Separation South of Moross	Date October 2018
		Figure No. **1-2**

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The Full Report is Available Upon Request

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Appendix B — Agency Correspondence

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Appendix C — BOD

(Executive Summary Only)

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BASIS OF DESIGN
EXECUTIVE SUMMARY

INLAND DISTRICT SEWER SEPARATION PROGRAM

City of Grosse Pointe Farms

October 17, 2022

HRC Job No. 20200155

Prepared by:

HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915

HUBBELL, ROTH & CLARK, INC.
Consulting Engineers
555 Hulet Drive • PO Box 824
Bloomfield Hills, MI 48303

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ACKNOWLEDGMENTS ..... *I*

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1.2 ALTERNATIVES CONSIDERED 1-2
1.3 PROPOSED PROJECT 1-3
1.4 ESTIMATED PROJECT COST, SCHEDULE AND IMPACTS 1-7

Acknowledgments

Hubbell, Roth & Clark, Inc. would like to acknowledge the following people and organizations for their valuable support and assistance during this project:

Mayor Louis Theros and City Council

Mr. Shane Reeside, City Manager and City Hall Staff

Mr. Scott Homminga, Water Superintendent and Staff

Section 1 - Executive Summary

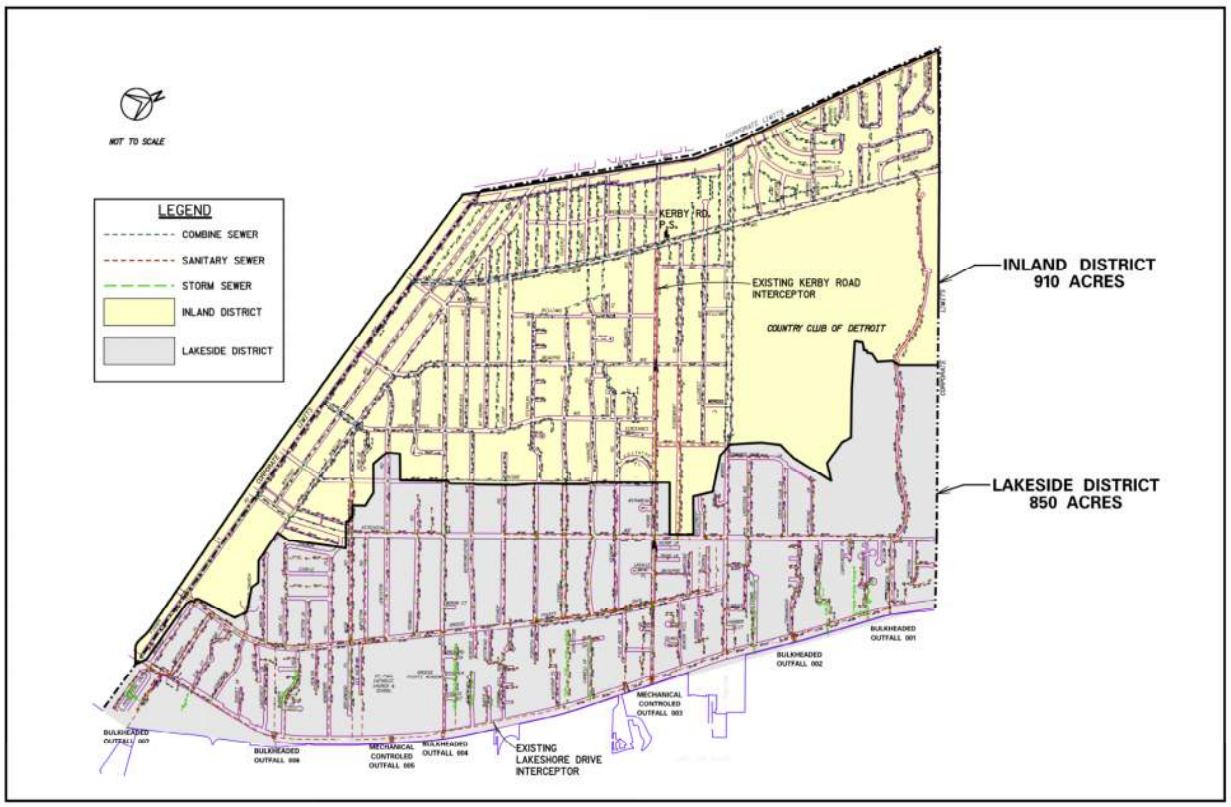
1.1 BACKGROUND AND NEED FOR PROJECT

The City of Grosse Pointe Farms (GPF) is served by a system of combined sewers and a large pumping station, the Kerby Road Sewage Pump Station (KRSPS), that was built in the 1920s. Combined sewers convey both sanitary sewage and stormwater runoff in the same pipe. As rain events increase in intensity, frequency and duration, sewers are more likely to become overwhelmed and the risk of basement and other flooding increases as well as the potential for overflows of the dilute sewage to surface waters. These discharges, known as combined sewer overflows (CSOs), are regulated by the Michigan Department of Environment, Great Lakes, and Energy (EGLE). Starting in the late 1980s and early 1990s, EGLE implemented several rules and policies to address untreated CSOs to protect public health and improve water quality, generally by allowing communities to implement a phased approach via long-term control plans.

In 2000, the City undertook a sewer separation project in the area east of Ridge Road, referred to as the "Lakeside District". The Lakeside District combined sewers were converted to convey only sanitary flows, and new storm sewers were constructed to convey only stormwater runoff to Lake St. Clair. This project successfully reduced CSOs into Lake St. Clair and the occurrence of basement flooding in the Lakeside District. A similar project to separate the sewers in the remaining portion of the City, known as the "Inland District", would have been much more difficult due to the topography in this area, which does not allow for storm sewers to flow by gravity into Lake St. Clair. Therefore, a similar project was not completed in this district. Refer to Figure 1-1 for a map of the Inland and Lakeside Districts.

All flows from the Lakeside District and the Inland District are conveyed to the KRSPS that pumps to the Fox Creek Enclosure (FCE). The FCE is currently maintained by Wayne County Department of Public Service (DPS), and was constructed between 1927 and 1930, is approximately 3.3 miles long and terminates at the Fox Creek Backwater Gates structure where the sewage enters a 14-foot diameter Detroit sewer. All of the City's sewage ultimately flows to the Great Lakes Water Authority's (GLWA) Water Resource Recovery Facility (WRRF) for primary and secondary treatment and disinfection.

Figure 1-1: Grosse Pointe Farms Sewer Districts



Upgrades were made to the KRSPS after two significant rain events in 2011 that resulted in street and basement flooding throughout the Inland District. The flooding in some areas was attributed to temporary interruptions of electrical feeds that caused issues with pumping operations at the KRSPS. However, in other areas, the cause of basement flooding varied and included issues with individual private sewer leads and local sewer capacity issues.

The KRSPS was updated with a new permanent emergency generator to provide backup power and other pump station upgrades. Additonal actions in response to the 2011 flooding included installing restricted catch basin covers in the Inland District's combined sewer system to reduce the peak storm flow into the combined sewers, and development of a hydraulic model to further study the system. However, the City has experienced more recent flooding during rain events in July 2016, June 2021 and July 2021. These events resulted in significant basement flooding throughout the City.

1.2 ALTERNATIVES CONSIDERED

The City has extensively studied the Inland District. As a result, a report was developed and titled, *Sewer System Evaluation*, dated August 2020. It considered a total of six alternatives with thirteen variations to

address the ongoing flooding issues. The study included sewer separation alternatives for the Inland District, whereby new storm sewers would be constructed in key locations to convey the stormwater flows, while the existing combined sewers would remain to convey the sanitary flows. The Inland District was divided into four quadrants (NE, NW, SE, and SW) relative to the intersection of Moross Road and Chalfonte Avenue to explore the effectiveness of separating each quadrant individually, various combinations of sewer separation and separation of the entire Inland District.

1.3 PROPOSED PROJECT

After careful review, the City selected Alternative 6, which generally includes:

- Removing storm flows from the west side of the Country Club of Detroit (CCD) from the City's combined sewer system (localized separation).
- Removing storm flows from the NW Quad from the City's combined sewer system (localized separation by constructing new storm sewers west of Chalfonte Avenue and north of Moross Road).
- Constructing a new storm water pump station at the northeast corner of Moross and Chalfonte, along with a new force main (FM) and gravity sewer to discharge the collected storm water out to Lake St. Clair.
- Partial separation of the combined sewer east of Chalfonte along Mount Vernon Avenue, McMillan Road and McKinley Avenue with the construction of new storm sewers that will discharge into the Chalfonte interceptor.

Refer to Figure 1-2 for Alternative 6 initial FM alignment.

Following the completion of the Sewer System Evaluation, the City initiated negotiations with CCD to evaluate FM routing through the golf course. This is a cost saving measure to the City in lieu of routing the force main down Moross Road where the existing infrastructure is already significantly overloaded and would require extensive modifications in order to install the new FM along with costly road restoration.

In exchange for the FM routing through CCD, the City investigated the feasibility and cost-effectiveness of providing raw water to the golf course for irrigation purposes. It was determined that it would be more cost-effective to construct (Contract 4) a raw water supply pump station at the City's Water Filtration and Pumping Station site and a new 12" watermain up to the CCD property. Subsequently, in September 2022, a memo of understanding (MOU) was developed and accepted by the City and CCD that will allow the City to route the force main and gravity sewer through the CCD property from Chalfonte and Moross out to Kerchaval Avenue. Refer to Figure 1-3 for Alternative 6 revised FM alignment.

When completed, these projects will reduce the peak flow rate and total volume of stormwater in the Inland Districts combined sewer system, thereby reducing the potential for flooding during the design storm events. All new storm sewers, the new force main, and the new stormwater pump station will be designed to have the capacity required for the 10-year 1-hour storm event and meet all EGLE requirements.

Figure 1-2: Alternative 6 Initial FM Alingment

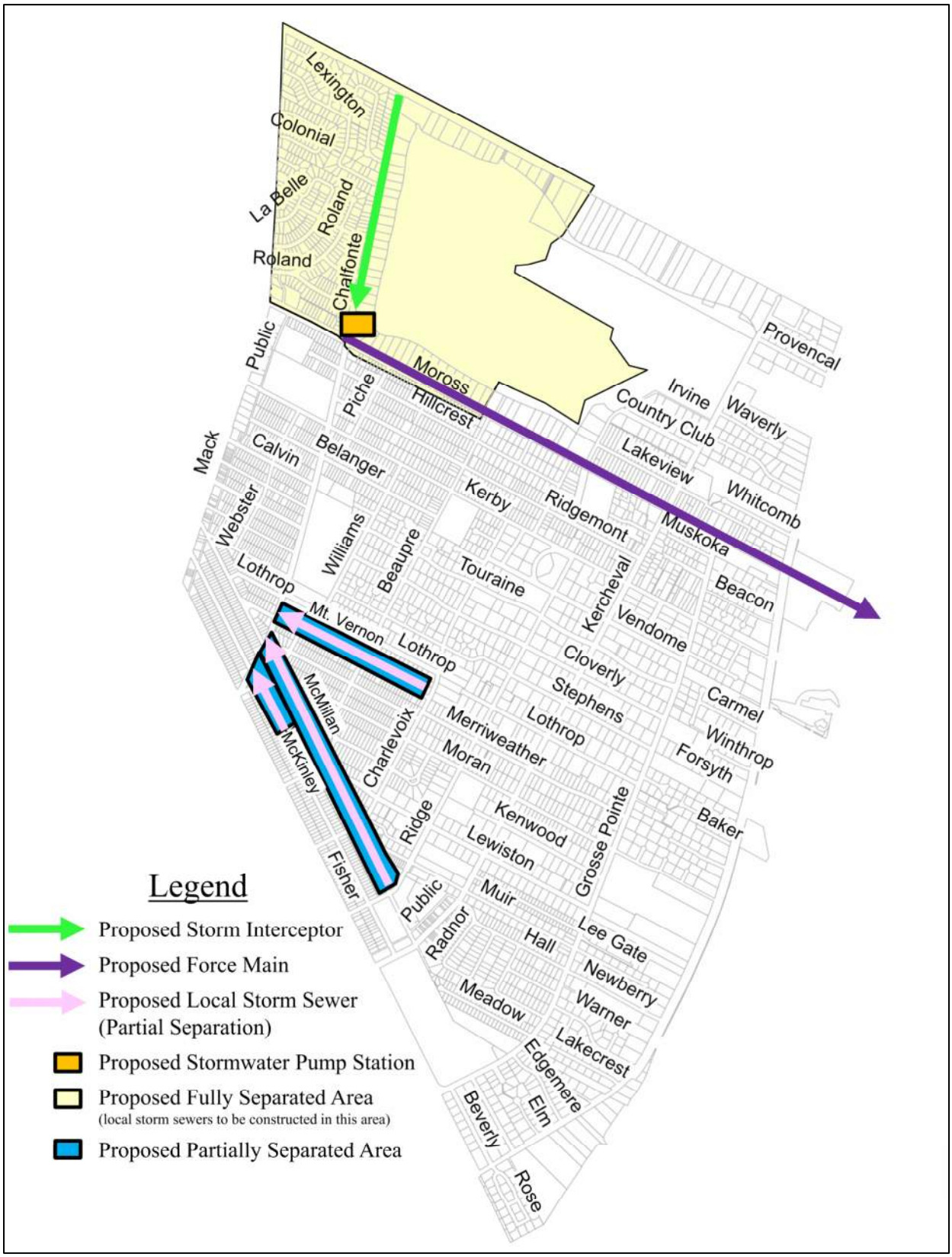


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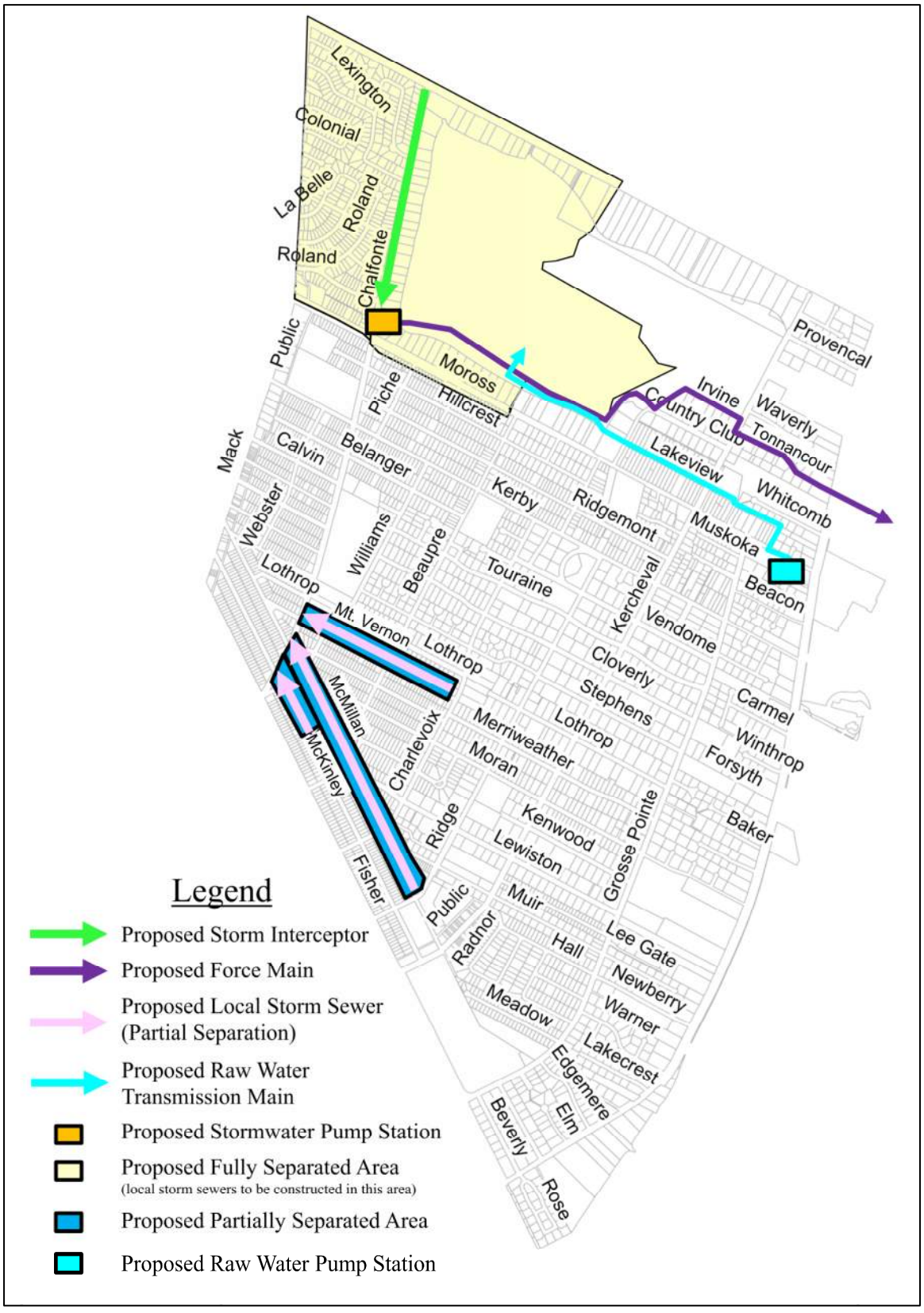
Figure 1-3: Alternative 6 Revised FM Alignment



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1.4 ESTIMATED PROJECT COST, SCHEDULE AND IMPACTS

The flood relief program is proposed to be constructed in a phased approach to minimize disruption to the community and consists of the following contracts:

- Contract 1- Force Main, Transition Structure, Gravity Sewer, and Outfall Structure.
  Estimated Project Cost: $10,225,000.
- Contract 2 - Pump Station, Junction Chamber and Influent Sewer.
  Estimated Project Cost: $17,070,000.
- Contract 3 - Sewer Separation of the NW/NE Quadrants and South End Relief Sewers.
  Estimated Project Cost: $12,170,000.
- Contract 4 – Raw Water Supply and Pump Station.
  Estimated Project Cost: $2,247,000.

The total estimated project cost for all four contracts is $41,712,000. Project costs include the following:

- Engineering design, administration, and legal.
- Construction costs.
- An average contingency of 20%.

The project cost estimates have been increased to reflect pricing as of September 2022.

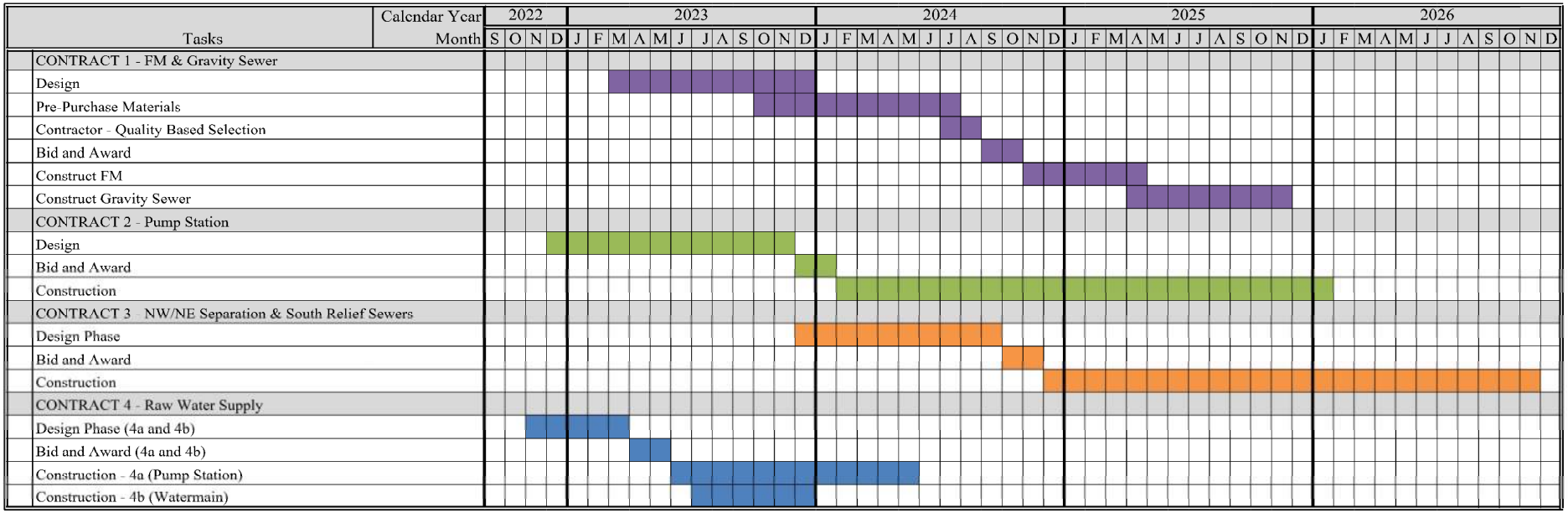
These contracts will also include the ongoing infrastructure improvements already planned in the areas of the Contracts 1 through 4 to coordinate and minimize disruption and improve overall costs.

Impacts to the community due to construction, while significant, will be temporary and will be offset by improved sewer system performance to reduce the potential for flooding and basement backups. Benefits will include:

1. Potential for flooding will be significantly reduced in the proposed separated areas
2. Flow reduction of approximately 31% from the Inland District to the KRSPS.
3. Separation of the north portion of the Inland District will help mitigate flooding in the remaining combined areas of the Inland District by freeing up capacity in the combined system and KRSPS.
4. Regional collection system benefits resulting from reduced flows into the combined system and ultimately the FCE.

A preliminary project schedule is shown in Figure 1-4 and provides an estimated timeline for the design, bid and award, and construction for each of the four contracts. This schedule may change slightly based on available funding options pursued by the City.

Figure 1-4: Estimated Project Schedule



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Appendix D — Stormwater Pump Station

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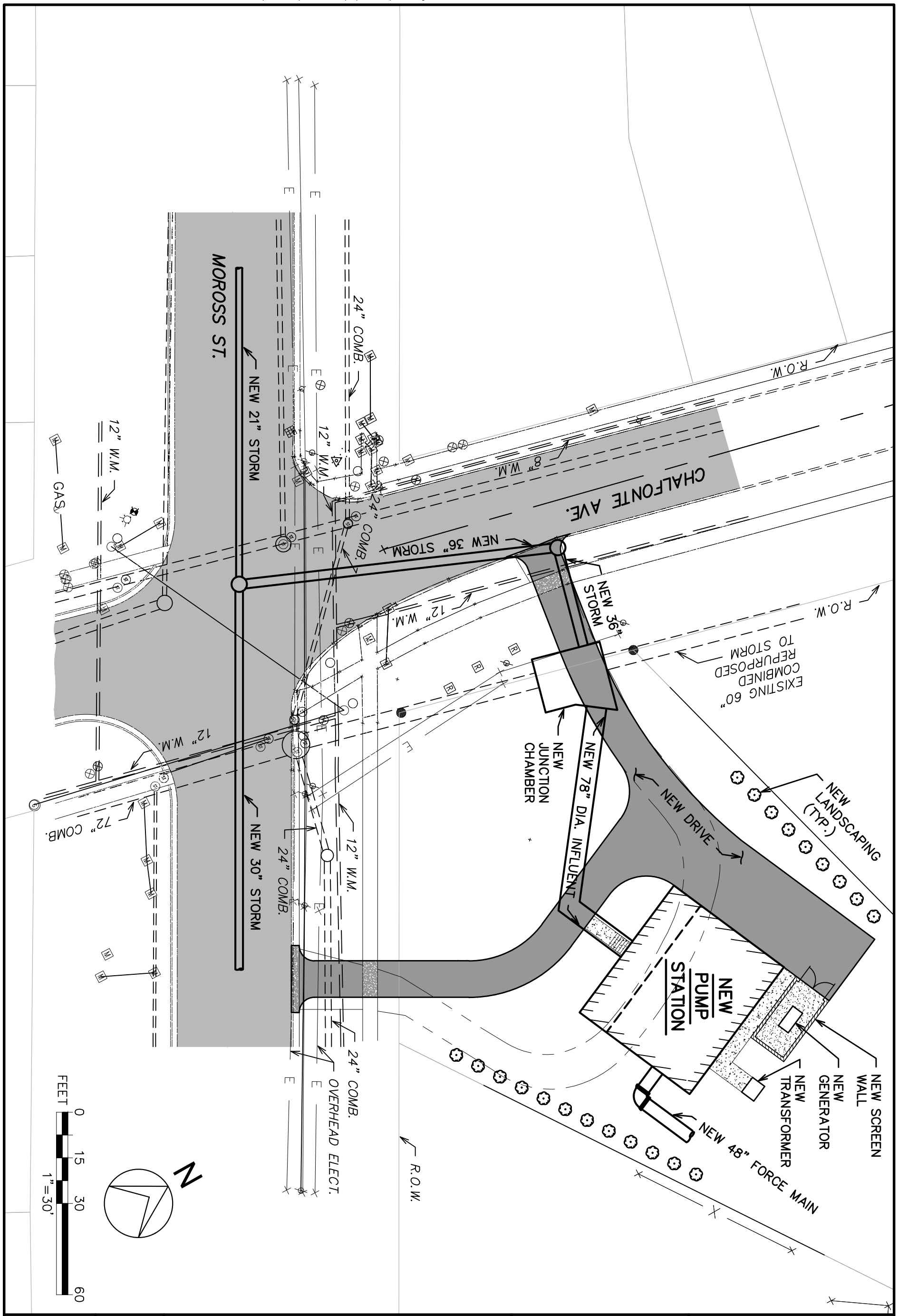

FIGURE NO.	JOB NO.		
C–1	20200155	PUMP STATION – PROPOSED SITE PLAN	HRC HUBBELL, ROTH & CLARK, INC CONSULTING ENGINEERS SINCE 1915
	DATE 8–4–21		555 HULET DRIVE BLOOMFIELD HILLS, MICH. P.O. BOX 824 48303-0824

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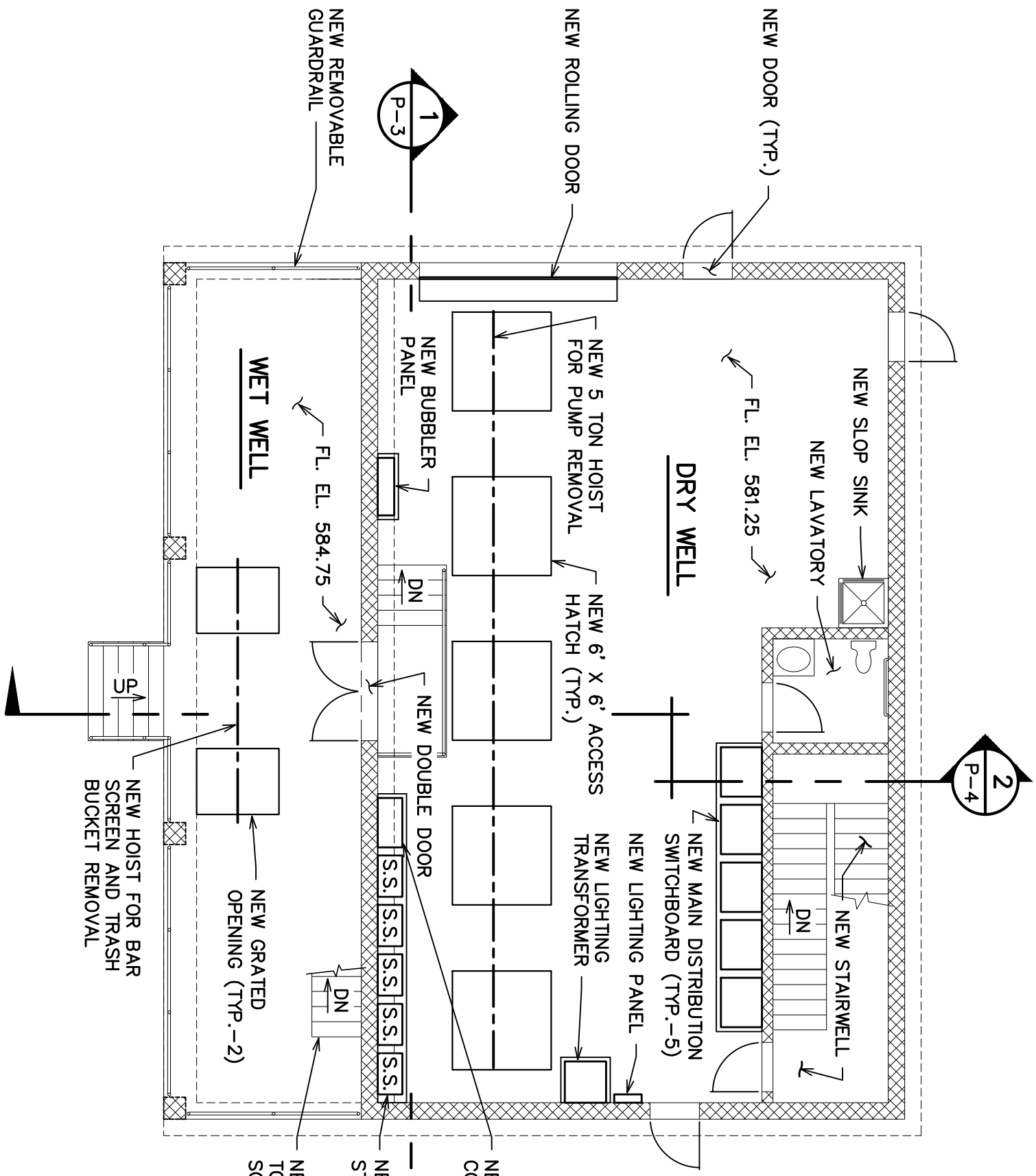

SECTIONAL PLAN @ ELEV. 585

SCALE: 1/8" = 1'-0"

FIGURE NO.	JOB NO.		
P-1	20200155	PROPOSED PUMP STATION - PLAN EL. 585	HRC HUBBELL, ROTH & CLARK, INC CONSULTING ENGINEERS SINCE 1915
	DATE 8-4-21		

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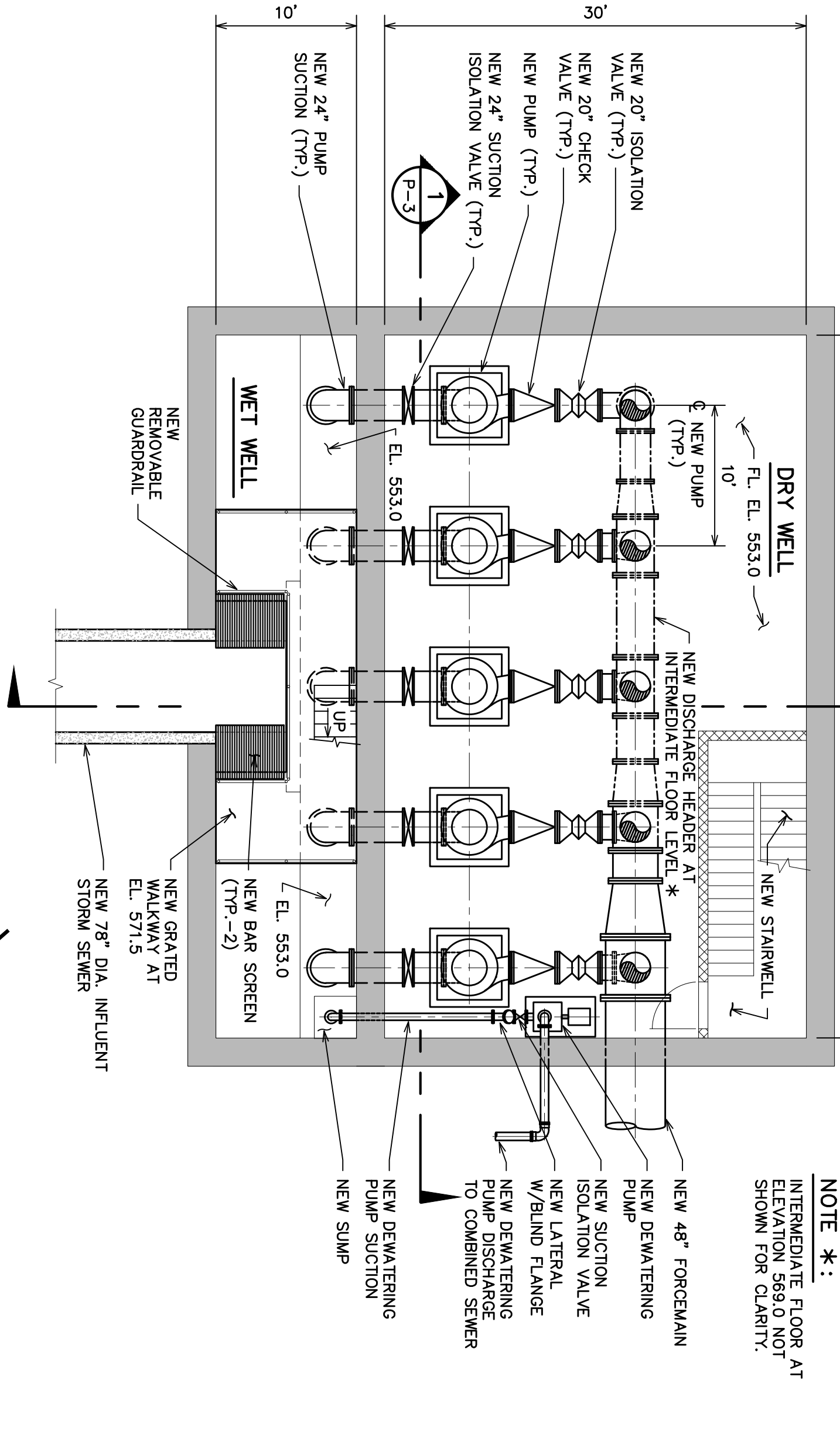

SECTIONAL PLAN @ ELEV. 567

SCALE: 1/8" = 1'-0"

NOTE *:

INTERMEDIATE FLOOR AT ELEVATION 569.0 NOT SHOWN FOR CLARITY.

FIGURE NO.	JOB NO.		
P-2	20200155	PROPOSED PUMP STATION - PLAN EL. 567±	HRC HUBBELL, ROTH & CLARK, INC CONSULTING ENGINEERS SINCE 1915
	DATE 8-4-21		

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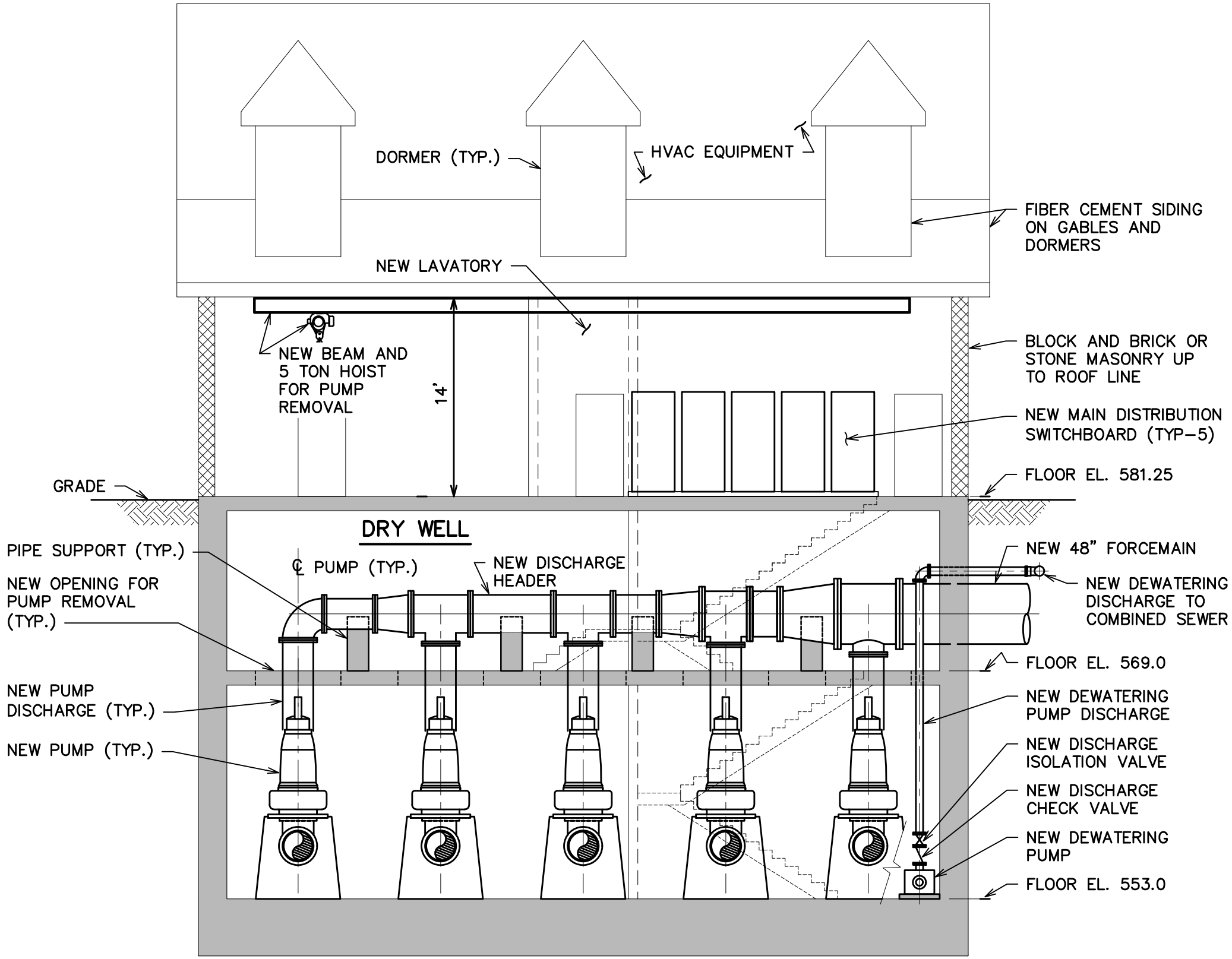

SECTION 1

SCALE: 1/8" = 1'-0"

P-1, P-2

SCALE IN FEET 0 2 4 8 16

1/8" = 1'-0"

PROPOSED PUMP STATION – SECTION 1

JOB NO.

DATE

FIGURE NO. P-3

HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915

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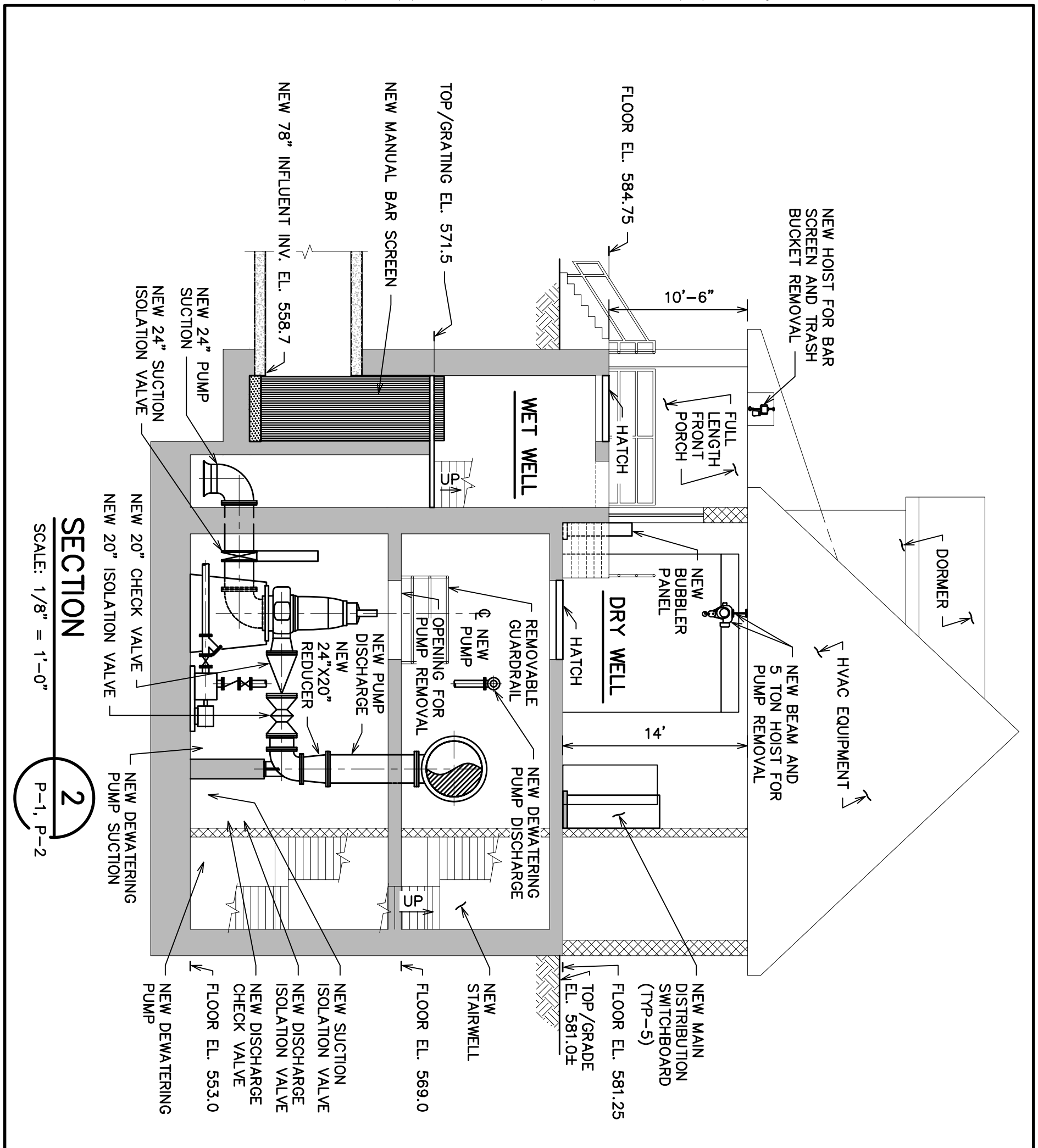

SECTION 2

SCALE: 1/8" = 1'-0"

P-1, P-2

SCALE IN FEET
0 2 4 8 16
1/8" = 1'-0"

FIGURE NO.	JOB NO.		
P-4	DATE	PROPOSED PUMP STATION - SECTION 2	HUBBELL, ROTH & CLARK, INC CONSULTING ENGINEERS SINCE 1915

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Appendix E — Stormwater Force Main & Gravity Sewer

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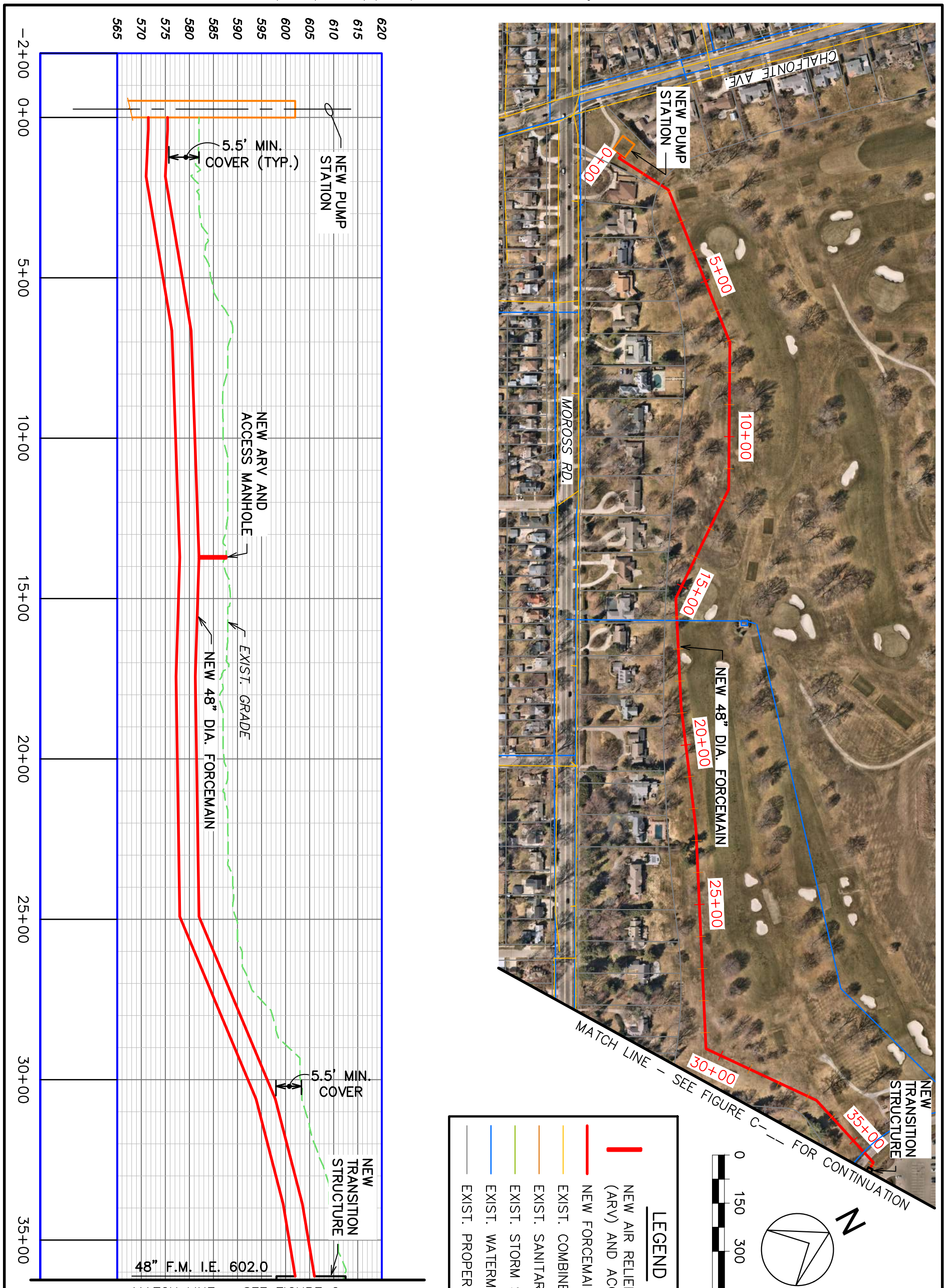

FIGURE NO.	JOB NO.		
C-2	20200155	PROPOSED FORCEMAIN - PLAN AND PROFILE	HRC HUBBELL, ROTH & CLARK, INC CONSULTING ENGINEERS SINCE 1915
	DATE 8-18-21		555 HULET DRIVE BLOOMFIELD HILLS, MICH. P.O. BOX 824 48303-0824

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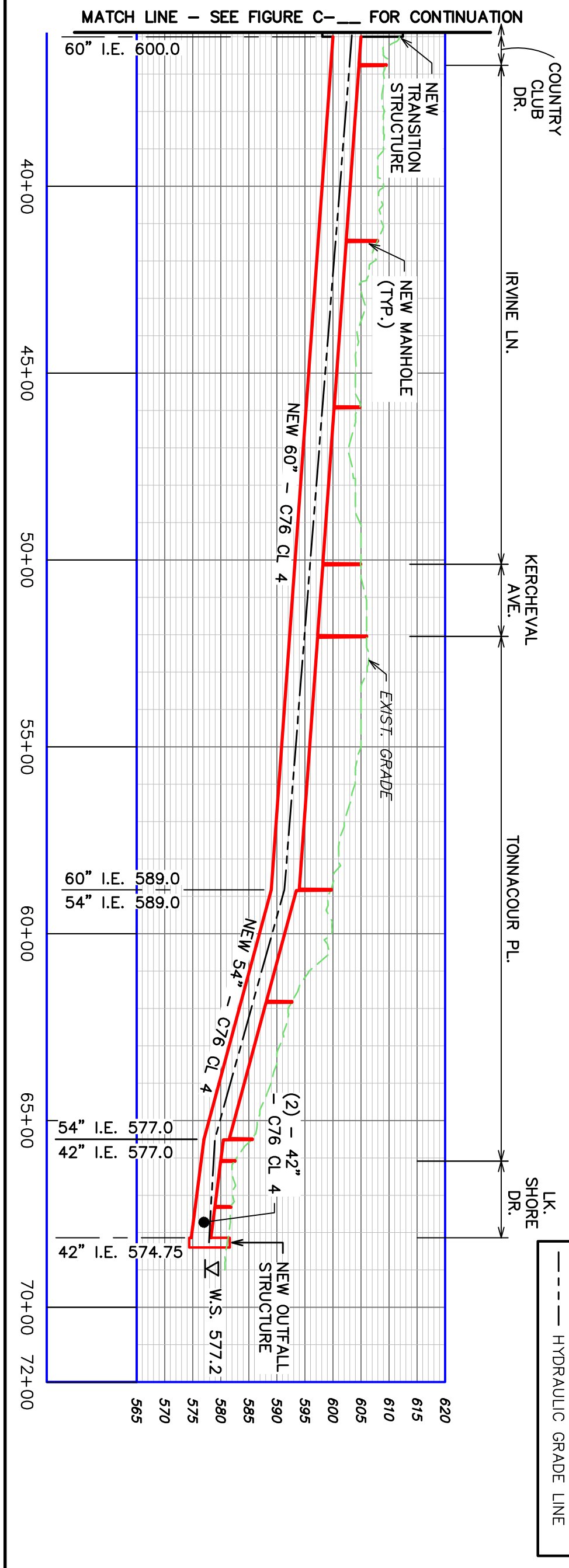

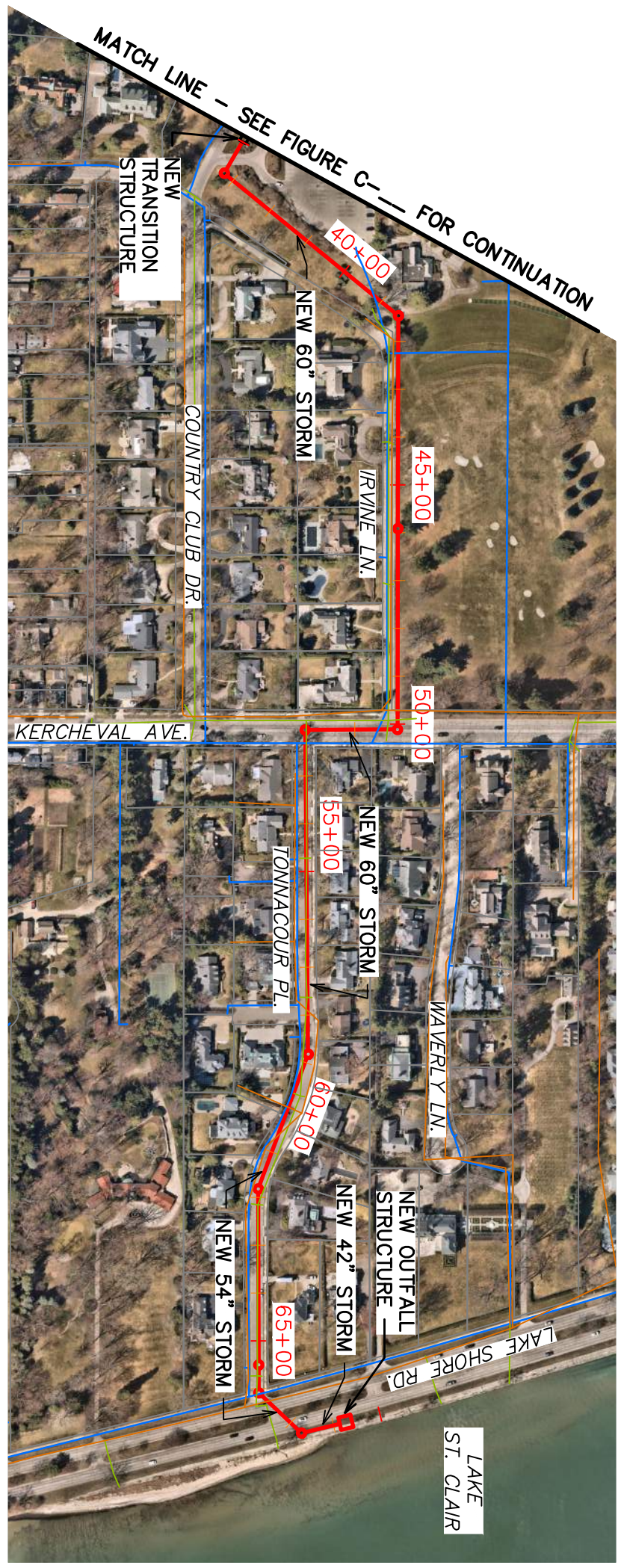

LEGEND

- NEW OUTFALL STRUCTURE
- NEW STORM MANHOLE
- NEW STORM SEWER
- EXIST. COMBINED SEWER
- EXIST. SANITARY SEWER
- EXIST. STORM SEWER
- EXIST. WATERMAIN
- EXIST. PROPERTY LINE
- HYDRAULIC GRADE LINE

SCALE IN FEET: 0, 150, 300, 600

N

FIGURE NO.	JOB NO.		
C–3	20200155	PROPOSED GRAVITY SEWER PLAN AND PROFILE	HUBBELL, ROTH & CLARK, INC CONSULTING ENGINEERS SINCE 1915
	DATE 8–18–21		555 HULET DRIVE BLOOMFIELD HILLS, MICH. P.O. BOX 824 48303-0824

Appendix F — Transition Structure

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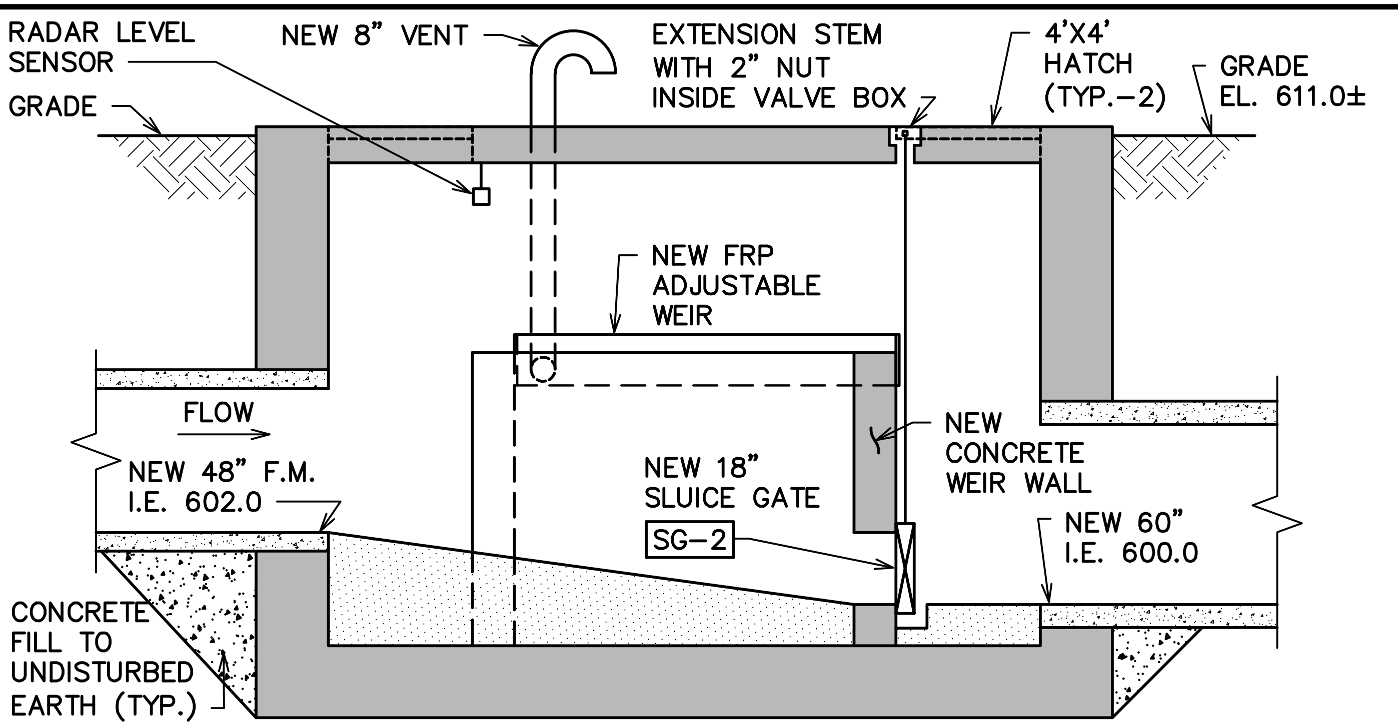
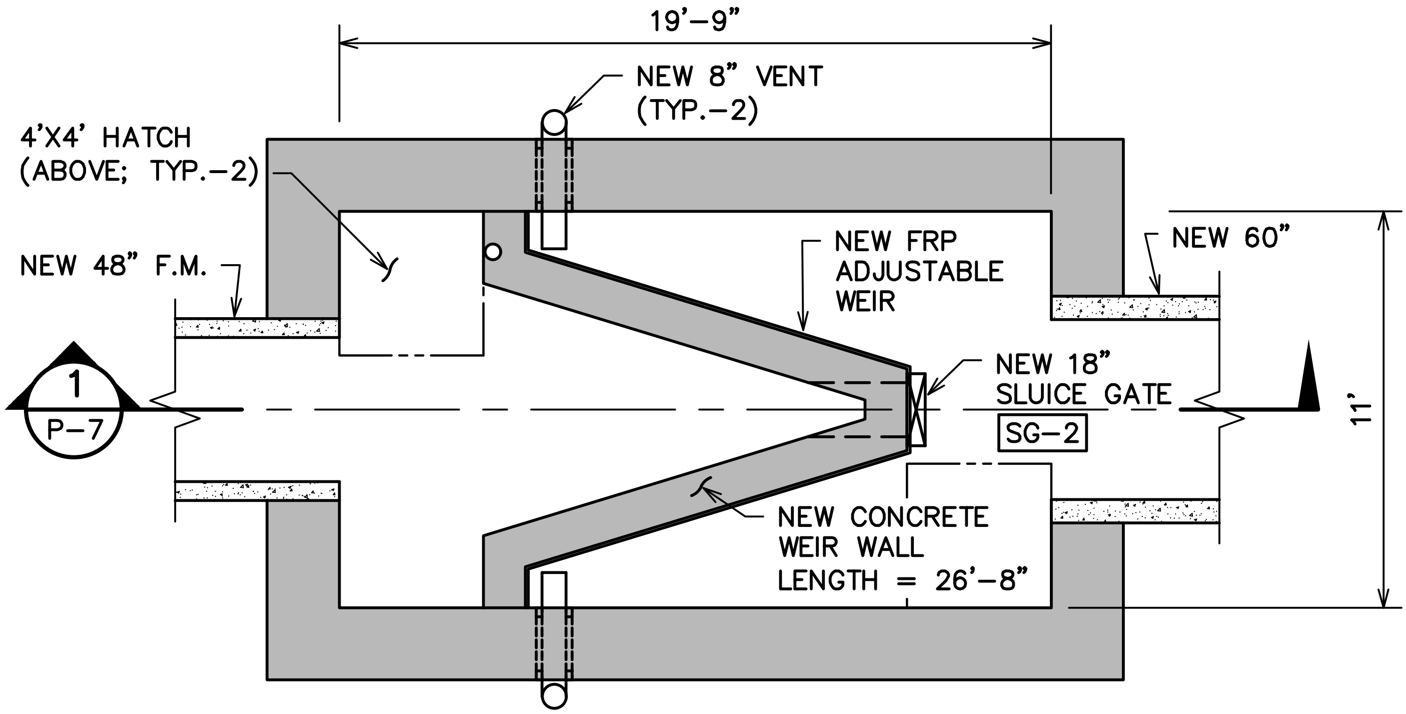


SECTION 1 P-7

SCALE: 3/16" = 1'-0"



SECTIONAL PLAN

SCALE: 3/16" = 1'-0"

HRC HUBBELL, ROTH & CLARK, INC CONSULTING ENGINEERS SINCE 1915	JOB NO. 20200155	PROPOSED TRANSITION STRUCTURE	SHEET NO. P-7
555 HULET DRIVE BLOOMFIELD HILLS, MICH. P.O. BOX 824 48303-0824	DATE 8-4-21		

DESIGNED DRAWN CHECKED APPROVED

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Appendix G — Project Cost & Users Cost Estimates

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HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915

Engineer's Opinion of Probable Project Cost

Project: Contract 1 - Forcemain, Gravity Sewer & Structures

Date: 03/01/23
By: TGM
Ck'd by:
ENR CCI Time of Est. 12,465
ENR CCI Current:

Job No.: 20200155
Prelim. X
Design: 30% 60% 90% Final

	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
1	Mobilization	1	LS	$ 200,000	$ 200,000
2	48" Force Main	3,600	LFT	$ 650	$ 2,340,000
3	60" RCP CL IV	2,290	LFT	$ 700	$ 1,603,000
4	54" RCP CL IV	660	LFT	$ 600	$ 396,000
5	42" RCP CL IV	560	LFT	$ 525	$ 294,000
6	Remove and Replace Full Width Raod	2,000	LFT	$ 550	$ 1,100,000
7	Transition Structure	1	LS	$ 300,000	$ 300,000
8	Outfall Structure	1	LS	$ 600,000	$ 600,000
9	8' MH - Combination Valve & FM Maintenance Access	1	EA	$ 50,000	$ 50,000
10	Restoration / Landscaping	1	LS	$ 230,000	$ 230,000
				Subtotal:	**$ 7,113,000**
	Contingency	25%			$ 1,778,000
				Subtotal:	**$ 1,778,000**
				CONSTRUCTION COST	**$ 8,891,000**
	PROJECT COSTS				
	Administrative, Legal and Engineering	15%			$ 1,334,000
				ENGINEER'S OPINION OF PROJECT COST	**$ 10,225,000**

DRAFT

HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915

Engineer's Opinion of Probable Project Cost

Project: Contract 2 - Moross Road Pump Station

Date: 03/01/23
By: TGM
Ck'd by:
ENR CCI Time of Est. 12,465
ENR CCI Current:

Job No.: 20200155
Prelim. X
Design: 30% 60% 90% Final

SPEC. DIV.	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
02	**CIVIL / SITE**				
	Excavation and Backfill	4,000	CYD	$ 65	$ 260,000
	Trucking	1	LS	$ 125,000	$ 125,000
	Site Improvements	1	LS	$ 125,000	$ 125,000
	New 78" Influent Sewer	100	LF	$ 825	$ 83,000
	New 48" Force Main to Property Line	120	LF	$ 625	$ 75,000
	Temporary Construction Dewatering	1	LS	$ 250,000	$ 250,000
				Subtotal:	**$ 918,000**
03-10	**STRUCTURAL / ARCHITECTURAL**				
	TERS	1	LS	$ 400,000	$ 400,000
	Junction Chamber	1	LS	$ 250,000	$ 250,000
	Concrete, S2	1,360	CYD	$ 1,000	$ 1,360,000
	Backfill, Structure, CIP	1,400	CYD	$ 30	$ 42,000
	Removeable Guardrail	300	LF	$ 300	$ 90,000
	Ladders	4	EA	$ 8,500	$ 34,000
	Structural Steel	13,500	LB	$ 50	$ 675,000
	Concrete Stairs	40	CYD	$ 1,250	$ 50,000
	Joint Waterproofing	500	SF	$ 15	$ 7,500
	Contoured Fill	125	CYD	$ 500	$ 62,500
	Concrete Rebar	340,000	LB	$ 2.50	$ 850,000
	Hatches	10	EA	$ 4,000	$ 40,000
	Masonry Walls	1	LS	$ 150,000	$ 150,000
	Glass Block Windows	5	EA	$ 2,500	$ 13,000
	OH Doors & Pedestrian Doors	1	LS	$ 50,000	$ 50,000
	Skylight	1	EA	$ 10,000	$ 10,000
	Roofing & Downspouts	2,226	SF	$ 20	$ 45,000
	Toilet Room Accessories	1	LS	$ 5,000	$ 5,000
	Paint, Sealant, Bollards & Miscellaneous	1	LS	$ 35,000	$ 35,000
	Hoist and rails	1	LS	$ 35,000	$ 35,000
				Subtotal:	**$ 4,904,000**
11-15	**EQUIPMENT/MECHANICAL**				
	Pumps	5	EA	$ 300,000	$ 1,500,000
	Manual Bar Screen	1	LS	$ 75,000	$ 75,000
	Plumbing, Heating & Ventilation System	1	LS	$ 325,000	$ 325,000
	Pumps Suction & Discharge Piping & Fittings	1	LS	$ 750,000	$ 750,000
	Valves & Gates	1	LS	$ 500,000	$ 500,000
				Subtotal:	**$ 3,150,000**
16	**ELECTRICAL/I&C**				
	Standby Generator and Pad	1	LS	$ 500,000	$ 500,000
	Utility Transformer, Pad, Meter	1	LS	$ 30,000	$ 30,000
	Main Switchboard	1	LS	$ 165,000	$ 165,000
	Wire and Conduit	1	LS	$ 250,000	$ 250,000
	Grounding	1	LS	$ 50,000	$ 50,000
	Power Distribution Equipment	1	LS	$ 150,000	$ 150,000
	Lighting	1	LS	$ 60,000	$ 60,000

HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915

SPEC. DIV.	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
	Equipment Racks/Pads	1	LS	$ 60,000	$ 60,000
	Instrumentation, Controls, Programming	1	LS	$ 250,000	$ 250,000
	Arc Flash Study	1	LS	$ 20,000	$ 20,000
				Subtotal:	**$ 1,535,000**
			TRADES SUBTOTAL:		**$ 10,507,000**
00/01	General Conditions GC, Overhead, and Profit	20%			$ 2,101,000
	Contingency	10%			$ 1,051,000
				Subtotal:	**$ 3,152,000**
			CONSTRUCTION COST		**$ 13,659,000**
00/01	**PROJECT COSTS**				
	Administrative, Legal and Engineering	25%			$ 3,415,000
			ENGINEER'S OPINION OF PROJECT COST		**$ 17,070,000**

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HUBBELL, ROTH & CLARK, INC
Consulting Engineers

Engineering. Environment. Excellence.

ENGINEER'S OPINION OF PROBABLE PROJECT COST

535 Griswold Street, Suite 1650, Detroit, MI 48226 — Telephone: (313) 965-3330

PROJECT: **Contract 3 - Inland District Sewer Separation** — DATE: **10/2/2022**

LOCATION: **Grosse Pointe Farms** — PROJECT NO. **20200115**

BASIS FOR ESTIMATE: [ ] CONCEPTUAL [X] PRELIMINARY [ ] FINAL — ESTIMATOR: **AWF**

WORK: **Sewer Separation of NW / NE Quads, CCD, Moross & South End Relief Sewers** — CHECKED BY:

CURRENT ENR:

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT AMOUNT	TOTAL AMOUNT
1	12" Storm Sewer, Trench "A"	1,535	LFT	$ 100	$ 153,500
2	15" Storm Sewer, Trench "A"	4,900	LFT	$ 110	$ 539,000
3	18" Storm Sewer, Trench "A"	6,105	LFT	$ 125	$ 763,125
4	21" Storm Sewer, Trench "A"	3,070	LFT	$ 150	$ 460,500
5	24" Storm Sewer, Trench "A"	3,065	LFT	$ 175	$ 536,375
6	30" Storm Sewer, Trench "A"	1,895	LFT	$ 250	$ 473,750
7	36" Storm Sewer, Trench "A"	240	LFT	$ 275	$ 66,000
8	6" Sanitary Lead SDR 23.5, Trench "A"	500	LFT	$ 75	$ 37,500
9	8" ABS Truss Pipe Sanitary Sewer, Trench "A"	4,200	LFT	$ 100	$ 420,000
10	Sanitary Manhole	16	EA	$ 3,000	$ 48,000
11	Connect to Exist. Sewer/Structure	20	EA	$ 2,000	$ 40,000
12	Manhole, 48" Diameter	71	EA	$ 4,000	$ 284,000
13	Manhole, 60" Diameter	17	EA	$ 8,000	$ 136,000
14	Manhole, 96" Diameter	8	EA	$ 20,000	$ 160,000
15	Remove & Replace Catch Basin	143	EA	$ 3,500	$ 500,500
16	Bulkhead, 0" - 24" Sewer	150	EA	$ 125	$ 18,750
17	Property Protection, Fencing (as required)	3,000	LFT	$ 3	$ 7,500
18	Structure Adjustment	120	EA	$ 400	$ 48,000
19	Audio-Video Route Survey	20,000	LFT	$ 3	$ 60,000
20	Pavement, Removal	26,500	SYD	$ 10	$ 265,000
21	Aggregate Base, 21AA, 6 inch	26,500	SYD	$ 15	$ 397,500
22	Aggregate Base, 1x3, 8 inch	26,500	SYD	$ 40	$ 1,060,000
23	Geogrid	26,500	SYD	$ 5	$ 132,500
24	Remove & Replace Concrete Curb	19,500	LFT	$ 75	$ 1,462,500
25	Remove & Replace Sidewalk Ramps	95	EA	$ 1,250	$ 118,750
26	GPF Interceptor Repurpose Verification	1	LS	$ 75,000	$ 75,000
27	Soil Erosion Control	1	LS	$ 75,000	$ 75,000
28	Traffic Maintenance and Control	1	LS	$ 50,000	$ 50,000
29	Restoration	1	LS	$ 75,000	$ 75,000
30	Mobilization (Max 5%)	1	LS	$ 250,000	$ 250,000
31	Inspection Crew Days	400	DAYS	$ 760	$ 304,000
	Subtotal				$ 9,017,750
	Administrative, Legal and Engineering	25%			$ 2,254,438
	Contingencies	10%			$ 901,775
	TOTAL PROJECT COST				**$ 12,170,000**

Appendix H — EGLE Correspondence

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Appendix I — Public Hearing Documentation

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Appendix J — EGLE Submittal Forms

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Michigan Department of Environment, Great Lakes, and Energy
Gretchen Whitmer, Governor
Liesl Eichler Clark, Director

http://www.michigan.gov/egle

Clean Water Revolving Funds
SRF/SWQIF Project Plan Submittal Form

Name of the Project	**Applicant's Federal Employer Identification Number (EIN)**
Legal Name of Applicant (The legal name of the applicant may be different than the name of the project. For example, a county may be the applicant for bonding purposes, while the project may be named for the particular village or township it serves.)	**Areas Served by this Project** Counties _____ Congressional Districts _____
Address of Applicant (Street, P O Box, City, State & Zip)	State Senate Districts _____ State House Districts _____
NPDES Permit Number (if permit holder)	**Associated SAW Grant Number** (if applicable)
Brief Description of the SRF/SWQIF Project	
Disadvantaged Community Determination ☐ The applicant is requesting a disadvantaged community determination, and a completed *Disadvantaged Community Status Determination Worksheet* is attached.	
Estimated Total Cost of the SRF/SWQIF Project	**SRF/SWQIF Construction Start Target Date**
Name and Title of Applicant's Authorized Representative	
Address of Authorized Representative (if different from above)	**Telephone** **E-Mail Address**
Signature of Authorized Representative	**Date**
Joint Resolution(s) of Project Plan Adoption/Authorized Representative Designation is attached. check here ☐	

A final project plan, prepared and adopted in accordance with the Department's *Clean Water Revolving Funds (SRF and SWQIF) Project Plan Preparation Guidance*, must be submitted by July 1st in order for a proposed project to be considered for placement on a Project Priority List for the next fiscal year. Please send your final project plan with this form to:

WATER INFRASTRUCTURE FINANCING SECTION
FINANCE DIVISION
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
P O BOX 30457
LANSING MI 48909-7957

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Project Useful Life and Cost Analysis Certification Form

Project Information

Applicant Name:

_____

SRF Project to be Funded:_____

_____

_____

Per Section 602(b)(13) of the Federal Water Pollution Control Act (FWPCA), all Clean Water State Revolving Fund (CWSRF) assistance recipients must certify that they have conducted the studies and evaluations described in 602(b)(13)(A) and (B), collectively known as a cost and effectiveness analysis.

☐ 1) The applicant has studied and evaluated the cost and effectiveness of the processes, materials, techniques, and technologies for carrying out the proposed project or activity for which assistance is sought under the CWSRF; and

☐ 2) The applicant has selected, to the maximum extent practicable, a project or activity that maximizes the potential for efficient water use, reuse, recapture, and conservation, and energy conservation, taking into account the cost of:
- constructing the project or activity;
- operating and maintaining the project or activity over the life of the project; and
- replacing the project or activity.

☐ 3) The applicant has completed a Project Useful Life analysis for the project or activity. **Attach appropriate documentation**

I certify that requirements (1), (2), and (3) as checked above have been met.

_____

Name of Professional Engineer *(Please Print or Type)*

_____

Signature of Professional Engineer Date

_____

Name and Title of Authorized Representative *(Please Print or Type)*

_____

Signature of Authorized Representative Date

DRAFT

**A RESOLUTION ADOPTING A FINAL PROJECT PLAN
FOR WASTEWATER SYSTEM IMPROVEMENTS or
NPS POLLUTION CONTROL/STORMWATER IMPROVEMENTS AND
DESIGNATING AN AUTHORIZED PROJECT REPRESENTATIVE**

WHEREAS, the _____ *(legal name of applicant)* recognizes the need to make improvements to its existing wastewater treatment and collection system or its existing NPS pollution control/stormwater treatment system; and

WHEREAS, the _____ *(legal name of applicant)* authorized _____ *(name of consulting engineering firm)* to prepare a Project Plan, which recommends the construction of _____

_____

_____; and

WHEREAS, said Project Plan was presented at a Public Hearing held on _____ and all public comments have been considered and addressed;

NOW THEREFORE BE IT RESOLVED, that the _____ *(legal name of applicant)* formally adopts said Project Plan and agrees to implement the selected alternative (Alternative No. _____).

BE IT FURTHER RESOLVED, that the _____ *(title of the designee's position)*, a position currently held by _____ *(name of the designee)*, is designated as the authorized representative for all activities associated with the project referenced above, including the submittal of said Project Plan as the first step in applying to the State of Michigan for a revolving fund loan to assist in the implementation of the selected alternative.

Yeas:

Nays:

Abstain:

Absent:

I certify that the above Resolution was adopted by _____ *(the governing body of the applicant)* on _____.

BY: _____
Name and Title *(please print or type)*

_____
Signature Date

DRAFT

Disadvantaged Community Status Determination Worksheet

The following data is required from each municipality in order to assess the disadvantaged community status. Please provide the necessary information and return to:

Robert Schneider
Water Infrastructure Financing Section
Finance Division
P.O. Box 30457
Lansing, MI 48909-7957
Schneiderr@michigan.gov

If you have any questions, please contact Robert Schneider at 517-388-6466

Please check the box this determination is for:

☐ DWRF ☐ SRF

1. Total amount of anticipated debt for the proposed project, if applicable.

   _____

2. Annual payments on the existing debt for the system.

   _____

3. Total operation, maintenance and replacement expenses for the system on an annual basis.

   _____

4. Number of "residential equivalent users" in the system.

   _____

For determinations made using anticipated debt, a final determination will be made based upon the awarded loan amount.

DRAFT

Project Useful Life and Cost Analysis Certification Form

Project Information

Applicant Name: _____

SRF Project to be Funded: _____

_____

_____

Per Section 602(b)(13) of the Federal Water Pollution Control Act (FWPCA), all Clean Water State Revolving Fund (CWSRF) assistance recipients must certify that they have conducted the studies and evaluations described in 602(b)(13)(A) and (B), collectively known as a cost and effectiveness analysis.

☐ 1) The applicant has studied and evaluated the cost and effectiveness of the processes, materials, techniques, and technologies for carrying out the proposed project or activity for which assistance is sought under the CWSRF; and

☐ 2) The applicant has selected, to the maximum extent practicable, a project or activity that maximizes the potential for efficient water use, reuse, recapture, and conservation, and energy conservation, taking into account the cost of:
- o constructing the project or activity;
- o operating and maintaining the project or activity over the life of the project; and
- o replacing the project or activity.

☐ 3) The applicant has completed a Project Useful Life analysis for the project or activity. **Attach appropriate documentation**

I certify that requirements (1), (2), and (3) as checked above have been met.

_____

Name of Professional Engineer *(Please Print or Type)*

_____

Signature of Professional Engineer Date

_____

Name and Title of Authorized Representative *(Please Print or Type)*

_____

Signature of Authorized Representative Date

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HRC OFFICE LOCATIONS

- **Bloomfield Hills**
  555 Hulet Drive
  Bloomfield Hills, MI 48302
  (248) 454-6300 | Fax: (248) 454-6312
- **Detroit**
  Buhl Building, Suite 1650
  535 Griswold Street | Detroit, MI 48226
  (313) 965-3330
- **Howell**
  105 West Grand River
  Howell, MI 48843
  (517) 552-9199
- **Kalamazoo**
  834 King Highway, Suite 107
  Kalamazoo, MI 49001
  (269) 665-2005
- **Delhi Township**
  2101 Aurelius Road, Suite 2
  Holt, MI 48842
  (517) 694-7760
- **Grand Rapids**
  801 Broadway NW, Suite 215
  Grand Rapids, MI 49504
  (616) 454-4286
- **Jackson**
  401 S. Mechanic Street, Suite B
  Jackson, MI 49201
  (517) 292-1295
- **Lansing**
  215 South Washington Square
  Lansing, MI 48933
  (517) 292-1488