Lake Ontario Resiliency and Economic Development Initiative

Engineering Report for MO.03 St. Paul Terminus and MO.09 NYSDEC Fishing Access

March 20th, 2020

LAKE ONTARIO REDI
Resiliency & Economic Development Initiative

POPLI DESIGN GROUP

REVISED FINAL REPORT

Engineering Report for MO.03/09 St Paul Terminus and NYSDEC Fishing Access

Prepared for:

New York State Office of General Services

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TABLE OF CONTENTS

APPENDICES

1. EXECUTIVE SUMMARY

In 2017 and 2019, the Lake Ontario and the St. Lawrence River System experienced high-water levels that resulted in severe flooding and erosion throughout the region. These conditions have caused adverse effects on property, infrastructure, business, and public safety. Given changes to the climatic baseline, New York State recognizes that moving forward requires planning for and responding to a potential new normal set of climate circumstances. For the Lake Ontario Region, learning how to adapt to and plan for a warmer, wetter, and more dynamic regional climate is emerging as a reality. By focusing on proactive resiliency planning that is informed by useful climate information and local input, the Lake Ontario Region has an opportunity to promote shoreline resiliency that allows communities and stakeholders to adapt to climate-related challenges.

This report covers a portion of the east bank of the Genesee River in the City of Rochester, New York near the river's mouth at Lake Ontario. The project area includes an approximately 975 foot stretch of Genesee River shoreline. The shoreline consists of the Monroe County Sheriff Marine Headquarters, NYSDEC Fishing Access, Monroe County Street, City of Rochester property, Town of Irondequoit WWPS and associated facilities along with a limited number of tax parcels owned by other businesses and parties. This portion of land has been subject to repeated flooding and property damage during the events described above and will remain threatened by future high water events if resiliency initiatives are not implemented. Under the REDI program, the project area has been separated into two distinct but connected projects: MO-03 St Paul Terminus and MO-09 NYSDEC Fishing Access.

As part of the REDI program, this report is prepared as an evaluation of alternatives and 10% conceptual design to help guide the next steps of the project execution process. The information provided in this document is primarily based on the online sources, site visits and discussions with City of Rochester, Monroe County and Town of Irondequoit personnel. Furthermore, this report includes recommendation for the next steps to investigate the site, perform the required field work and prepare a detailed assessment of the alternatives prior to making a final decision on the selected alternative. The cost estimates provided in Section 7 is for order of magnitude construction costs only, and include non-construction costs and contingency at 25 and 30 percent of total construction costs respectively.

2. PROJECT BACKGROUND AND HISTORY

2.1 Location

Figure 1: Site Location

St. Paul Terminus is located on a strip of land within the extreme northwestern corner of the Town of Irondequoit in Monroe County, New York. Also known as the Summerville Lakeshore Area, the site is just east of the outlet of the Genesee River and extends approximately 975 feet along the shoreline at the end of St. Paul Boulevard (**Figure 1**). The encompassing area consists of Monroe County Sheriff Marine Headquarters (MC Sheriff Marine HQ), NYS-DEC Fishing Access Area, Silk O'Loughlin's Restaurant, the United States Coast Guard (USCG), Summerville Wastewater Pumping Station (WWPS), Summerville Loop RTS Bus Station and portions of the Westage at the Harbor condominium complex.

2.2 Physical/Geological Conditions

The Port of Rochester is located at the mouth of the Genesee River on the southern shore of Lake Ontario, about nine miles north of downtown Rochester. As part of the Eastern Great Lakes Lowlands region, the land surrounding the port is identified as flat-lying with low grade change, overlaid by glacial lake deposits.

- Soil type

Soil data was obtained from the Natural Resources Conservation Service (NRCS) Web Soil Survey. As shown in **Table 2.2.1**, the areas along the eastern shoreline of the Genesee River are composed of a single soil unit: lake beaches (Lb) while the area southeast of the MC Sheriff Marine HQ is composed of Eel silt loam (Ee).

Table 2.2.1: NRCS Web Soil Survey

Map Unit Symbol	Map Unit Name	Drainage Type	Depth to Water Table (inches)	Flooding Frequency	Hydric Rating
Ee	Eel silt loam	Moderately well drained	18-24	Occasional	No
Lb	Lake beaches	Unranked	Unranked	Unranked	Unranked

Lake beach surficial deposits composed of sand, gravel, or silt are common on the site. Based on the *New York State Museum of Surficial Geology* mapping, surficial geology of the project area consists of a layer of laminated clay and silt that was deposited into lakes formed by the glacial ice that covered Western, NY at the end of the last ice age. The major beach deposit of the area is that of glacial Lake Iroquois. Generally this deposit contained calcareous soil with low permeability, resulting in the potential for low infiltration rates, poor drainage, and land instability.

However per the Bergmann 2017 Draft Report, the most recent layer of soil in the area is primarily alluvium, which is composed of oxidized fine sand to gravel as a resultant from stream deposition. This layer ranges in thickness from one to ten meters and may be overlain by silt. Additional information regarding soil erosion, channel deposition, dredging, and other physical / geological conditions are summarized in the Bergmann 2017 report.

Aside from natural geology of the area, because the existing site area is a developed waterfront property, and has therefore been previously disturbed, there is potential that any excavations performed during the construction of this project may expose subsurface urban fill. For this reason, it is recommended that a soil investigation be conducted in conjunction with the final design in order to determine the quality of in-situ soil and the presence of soil contaminants. If uncontrolled urban fill is encountered during construction, the material should be removed appropriately and replaced with controlled structural fill as specified in the final design.

Other relevant resources available for physical and geologic data are USGS Seismic Hazard Maps and the National Earthquake Hazards Reduction Program (NEHRP). According to the U.S. Geological Survey, the only major structural hazard in the vicinity of the project area is the Clarendon-Linden Fault Zone, located approximately 20 miles from the project site. This fault zone extends at least 58 miles from near the shoreline of Lake Ontario in Orleans County to south-southwestward into northern Alleghany County, Western NYS (Crone and Wheeler, 2000). Historical records indicate this fault zone has likely been the source of several earthquakes, including an intensity VIII occurrence in Attica, NY in 1929. Also, based on the Seismic Zone Map of the Contiguous States, the project area is documented to be within Seismic Zone 2, which designates that in the event of an earthquake moderate damage would occur (U.S. Army Corps of Engineers Buffalo District, 1985).

Additionally, the 2017 *DMA 2000 Hazard Mitigation Plan Update – Monroe County, NY* identifies the soils within the project area to be NEHRP Soil Classification E. This classification represents soft soil comprised of fill, loose sand, waterfront, and lake bed clays. During an earthquake, soil of this composition amplifies and magnifies ground shaking, increasing building damage and losses.

Overall, it is recommended that the above mentioned structural geology and seismicity of the site shall be taken under careful consideration for the final design of any improvements as part of this project.

- Bedrock

According to *New York State Museum of Bedrock Geology* mapping, the project area is underlain by the oldest bedrock formation in Monroe County, the Queenston formation. This formation is composed of shale and siltstone that was deposited more than 410 million years ago during the Upper Ordovician period (Paleozoic Era). Further, as part of the *Rochester Harbor East Pier Repair* project in 1985, bedrock was not encountered in the borings / probings taken by the USACE within the project area. Based on the depths of these field tests, it was deduced that top of rock is at least below elevation 203 (40 ft below LWD).

- Water Depth

The U.S. Army Corps of Engineers (USACE) has divided the Genesee River into sections for the purposes of defining the parameters of the channel's dimensions, as well as for maintenance of the harbor itself. According to most recent USACOE bathymetric readings, the section of the entrance channel that extends from the Rochester Yacht Club to the northern most point of the east pier was constructed to a depth of 23 feet and is currently maintained to a depth of 21 feet.

- Slope

As the Genesee River approaches Lake Ontario, the adjacent lands on either side of the pier flatten out substantially. This is verified by existing LiDAR models from Monroe County and recent field elevation checks, which display estimated slopes within the project area being relatively minimal, ranging between 0.01% and 3% throughout. The available data depicts grading patterns such that the MC Sheriff Marine HQ, the east portion of the NYS-DEC Fishing Access Lot, the south portion of Westage at the Harbor, and the end of St. Paul Boulevard all drain toward the Club Terrace Loop (the low point), while the USCG Station and Silk O'Loughlin's maintain a low point at the edge of the shoreline or within each individual property, respectively (**Figure 2**).

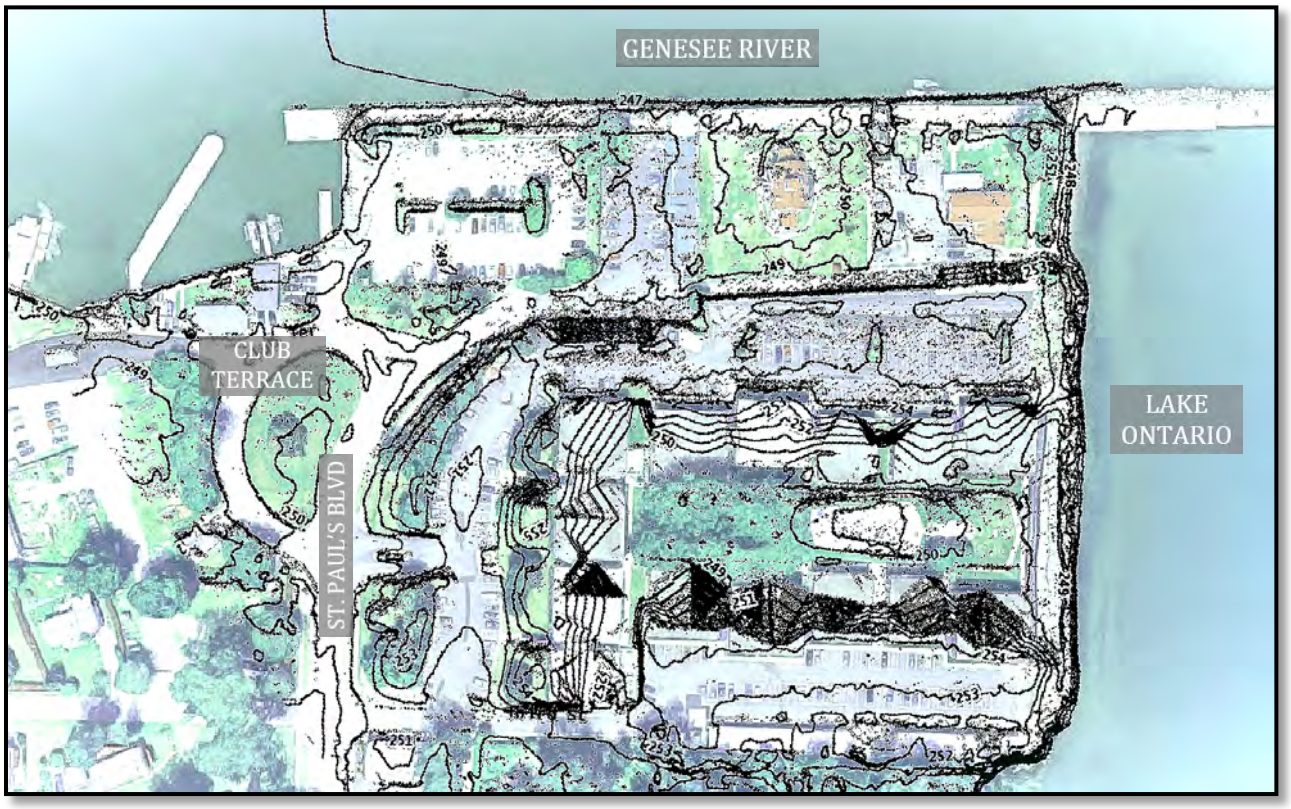

Figure 2: Existing Site Topography

2.3 Environmental Conditions

Various sources and datasets were used to assess existing environmental resources of St. Paul Terminus and the surrounding area within the project limits. The following sections describe the environmental resources of the area.

- Wetlands

As due diligence for this report, it was necessary to review the United States Fish and Wildlife Service (USFWS) national Wetland Inventory (NWI) maps of the site, last updated May 5th 2019, in order to identify potential wetland areas within the project area. NWI is only intended to provide reconnaissance level information of potential wetlands on site and is not to be considered as Jurisdictional WOTUS (USFWS 2019).

The NWI mapper identified two federally designated wetlands across wetland types associated with the site as outlined in **Table 2.3.1**.

Table 2.3.1: USFWS NWI Map Summary

NWI Code	System	Subsystem	Class	Water Regime
L2UBH	Lacustrine: Deepwater habitats such as lakes	Littoral: Extends from shoreward boundary to depth of 8.2ft below water	Unconsolidated bottom: Habitats with at least 25% cover of particles smaller than stones and a vegetative cover less than 30%	Permanently flooded
R2UBHx	Riverine: Deepwater habitat contained within a channel *Excavated by humans	Lower Perennial: Low gradient, no tidal influence, and some water flows all year	Unconsolidated bottom	Permanently flooded

These two wetlands represent the Lake Ontario (L2UBH) and the Genesee River (R2UBHx) to the North and West of the Site, respectively.

According to the NYSDEC Environmental Resources Mapper, one state regulated wetland is within proximity of the site. RH-9 is an estimated 53.2-acre class 2 state regulated Freshwater Emergent Wetland located approximately 1.25 miles south from the Site. No other wetlands are shown located outside of the River and Lake within the project limits. In addition, no New York State rare or protected species were identified on the Mapper for the project area.

- Aquatic Habitat

As one of the 4 major tributary watersheds to Lake Ontario, the Genesee River is one of the most important potential fish and wildlife habitats in the Great Lakes Plain ecological region of New York State. Due to its large size, as well as the idea that the bulk of the river's corridor is undisturbed, the river provides habitat for a range of aquatic species.

As specified in the NYSDOS *Coastal Fish & Wildlife Habitat Rating Form for the Genesee River,* the Genesee River is a highly productive habitat for warmwater fisheries. The river supports resident warmwater fish species including smallmouth bass, brown bullhead, northern pike, channel catfish, walleye, carp, and white sucker, in addition to lake-based fish species including white bass, yellow perch, white perch, smelt, bowfin, sheepshead, rock bass, and American eel. Furthermore, ongoing efforts of fish stocking by the NYDEC has designated the Genesee River as having one of the highest salmonid concentrations of all of Lake Ontario's tributaries (Bergmann 2017). The major salmonid runs in the River are as follows:

- In the spring (late February-April), steelhead run up the river, and lake trout occur at the mouth.
- In the fall (September-November, primarily), concentrations of coho and chinook salmon, brown trout and steelhead are found throughout the river during their spawning runs.

The extensive cultivation of warmwater and salmonid fisheries within the channel has established the Genesee River as an important recreational fishery, attracting anglers from throughout New York State and beyond. Locally, the Genesee River is very popular with City residents, primarily at the mouth of the river along the Charlotte and Summerville Piers. Along the shoreline of the project area (Summerville Pier), the NYS-DEC runs a scenic Harbor Fishing Access site for local recreational fishing. During the final design of this project, it is required that the NYSDEC Regional Office be contacted to discuss and determine whether the proposed activities are subject to regulation. In doing so, detailed construction plans will be needed to determine if there are potential fishery concerns for disturbances to the waterways.

It is important to note that water pollution and extensive alteration of the lower river channel has reduced the environmental quality of the Genesee River. Further details regarding pollution of the Genesee, active and future remediation plans such as the Rochester Embayment Remedial Action Plan, and other aquatic species within the channel can be found in the 2017 Bergmann Report.

- Rare, Threatened, and Endangered Species and Significant Habitats

According to the NYSDEC Environmental Resources Mapper, the location of the site is within the vicinity of Animals Listed as Endangered or Threatened; in particular - Pied-billed Grebe (T) and Least Bittern (T). During the final design of this project, it is required that the NYSDEC Regional Office be contacted to discuss and determine whether the proposed activities are subject to regulation.

- Archeology

GIS data from the New York State Historic Preservation Office (SHPO) lists the project area as Archeologically Sensitive. Consultation with the New York State Office of Parks, Recreation, and Historic Preservation (NYS OPRHP) should be performed to identify the potential presence of archeological resources and the potential need to perform a cultural resources investigation due to the development of the project area. Potential impacts to these resources must be considered in the State Environmental Quality Review (SEQR) documentation during the final design.

- Floodplain considerations

The work will take place within the 100-year floodplain. According to Federal Emergency Management Agency (FEMA), the project area is located within a Special Flood Hazard Area, the AE Zone, and as such all proposed development in the area is subject to floodplain development regulations. This means that all development of buildings and other structures, mining, dredging, filling, paving, excavation, drilling, or storage of equipment or materials is subject to construction regulations if it occurs within a Special Flood Hazard Area.

The standard development requirements within an "AE Zone", when there is a base flood elevation available, is that the lowest floor including any basement must be at or above the base flood elevation. Similarly for utilities, all machinery and equipment must be elevated to or above the base flood elevation. For the Summerville Lakeshore, FEMA designates the current 100-year floodplain base flood elevation to be 249 feet for the Genesee River and 250 feet for Lake Ontario. The Genesee River base flood elevation was surpassed in 2019 with a record high water level of 249.1 feet. All alternatives developed as part of this project will have to adhere to these standard development requirements for the current base flood elevation, along with adjusting these requirements accordingly to handle record high water levels. The final Site Plan for this project will also be required to delineate the floodplain and floodway boundaries per FEMA record map data. Additionally it is recommended that as an early part of the design process, a single comprehensive floodplain review and encroachment review for all of the Genesee river projects under the REDI program is recommended.

- Water Levels

According to the International Joint Commission (IJC), the historical average high water level of Lake Ontario between 1918 and 2018 is 246.26 feet IGLD1985 (**Figure 3**). Additionally, the USACE defines the federal regulatory boundary for Lake Ontario as the Ordinary High Water (OHM) established at 247.3 IGLD1985 (Bergmann 2019).

Water levels at the Great Lakes have been regularly and systematically recorded since 1860 and show long term water-level fluctuation. Throughout this recorded time, Lake Ontario has experienced both extreme high-water levels and extreme low water levels that appear to have coincides with climatic variability such as changed in precipitation, evaporation rates, and amount and duration of ice cover (USACE 1999, Gronewold et al. n.d.). Periods of extreme low water levels have generally occurred in 20 to 30-year cycles, i.e., in the mid-1890s, mid 1920a, mid-1930s, mid-1960s, 1999, early 2010s, and 2016, while extreme highs were experienced in the 1870s, late 1920s, early 1950s, early 1970s, mid-1980, mid-1990s, and late 2010s with record highs occurring in 2017 and 2019 (Wilcox et al. 2007, USACE 1999). Water regulations which started in Lake Ontario in about 1960 have reduced water level extremes (Wilcox et. Al. 2007, USACE 1999). For example, prior to regulation in 1952, Lake Ontario water levels ranged 6.6 feet or from 248.6 feet to 242.0 feet in one hydrologic season. With regulation, the seasonal water level range has reduced 1.7 feet annual variability, on average (Wilcox et al. 2007). Beginning in 2017 and again in 2019, Lake Ontario began experiencing record high water levels as a result of persistent precipitation, variable winter temperatures, ice patterns, and extreme water supply conditions causing the lake to rise to a record breaking 249.1 feet in 2019, approximately 0.5 feet above average high and 1.8 above the Federal Ordinary High Water Mark (**Figure 3**; ILO-SLRB 2019).

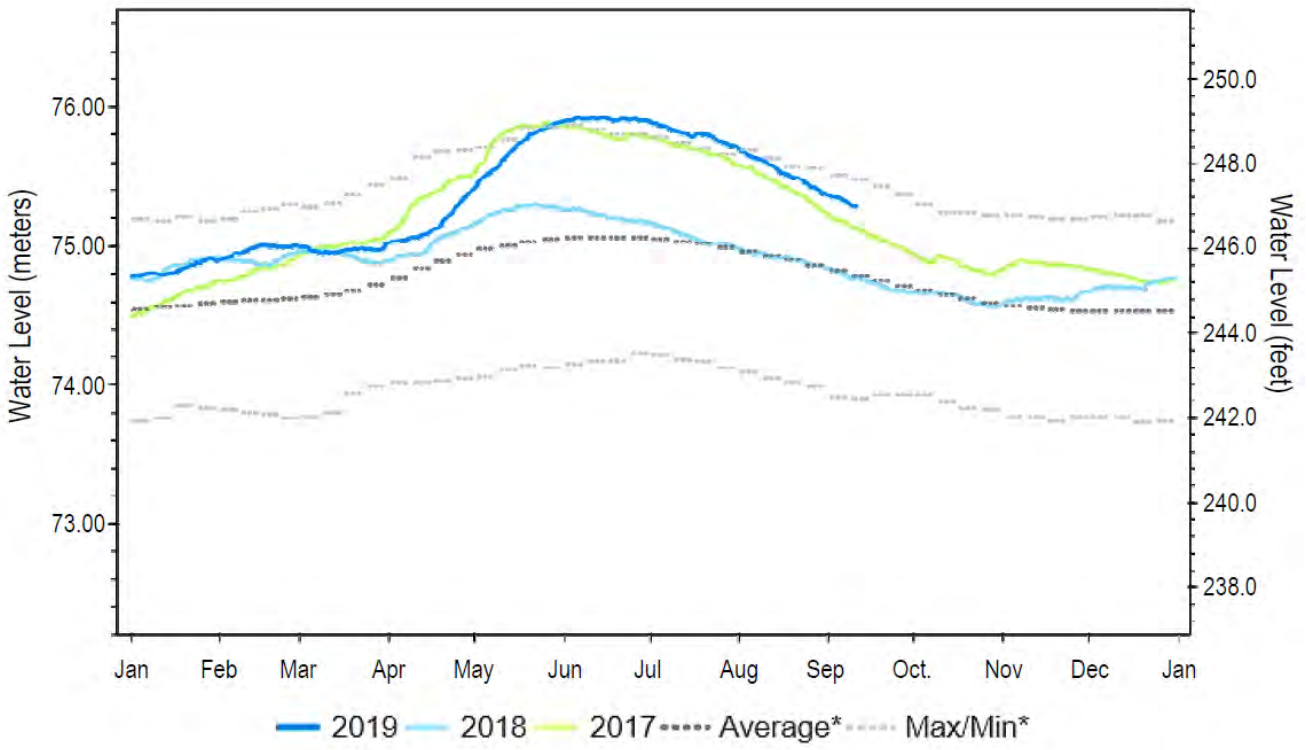

Figure 3: Lake Ontario Daily mean water levels (ft, IGLD 1985) from January 1918 to present (International Joint Commission)

2.4 Ownership and Service Area

- Publicly or Privately-owned

St. Paul Terminus is comprised of multiple parcels of land both publicly and privately owned (**Figure 4**). The area functions predominantly for public access to the Lake Ontario Waterfront and Summerville Pier, as well as serves to provide security and public safety to the Port of Rochester. Coordination between the various owner entities will be vital for the determination of feasible options and the progression to a final design.

Public entities are the primary property owners in the area. These properties include:

- City of Rochester
- Monroe County Sheriff Marine Headquarters (Monroe County)
- St Paul Boulevard (Monroe County)
- NYS-DEC Fishing Access Area (City of Rochester and New York State)
- United States Coast Guard Station (United States Government)
- Portions of Club Terrace and St. Paul Boulevard (Town of Irondequoit)

The remaining privately-owned parcels within the Site boundary are as follows:

- Silk O'Loughlin's Restaurant
- Westage at the Harbor Condominium Complex

At the time of this report, determination of project participation of all private entities and the United Stated Coast Guard Station is ongoing. Final design will also require identification of, and negotiation to acquire the required property easements for project execution.

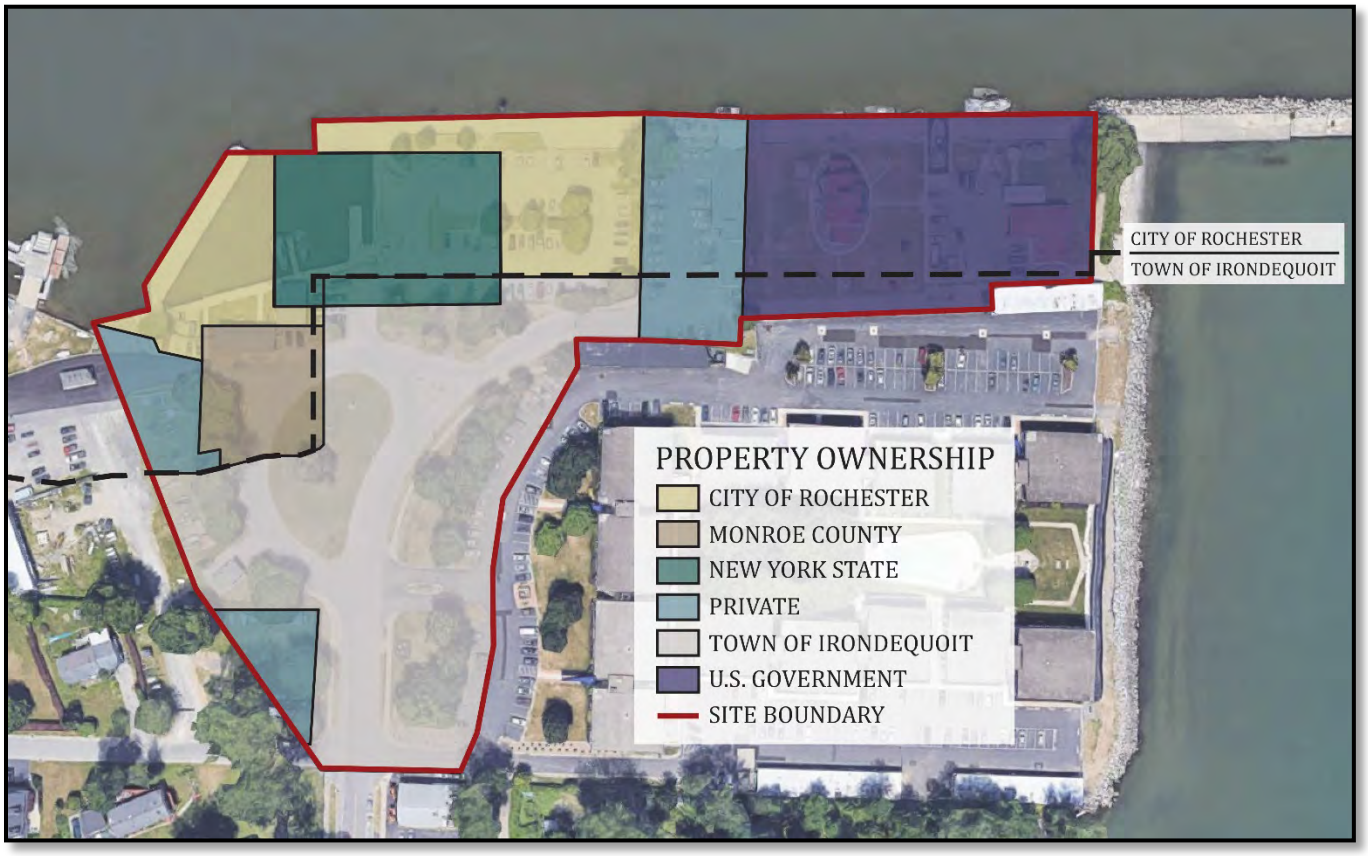

Figure 4: St. Paul Terminus Property Ownership Map

- District Boundaries

Parcels immediately adjacent to the Genesee River are incorporated within the City of Rochester Harbortown Village (HV) zoning district. This includes the USCG Station, Silk O'Loughlin's, The NYS-DEC Access Area, and the Monroe County Sheriff Marine HQ. Per the Bergmann 2017 Draft Report, the HV District provides for a "distinct neighborhood developing around the mouth of the Genesee River and the shore of Lake Ontario as a unique and lively water- and pedestrian-oriented area." Moreover the zoning regulations within this district promote public access, encourage tourism and preserve the waterfront environment.

- Sewer Systems

Utility records indicate the nearest public sewer systems are located along St. Paul Blvd and the Club Terrace Loop, within Town of Irondequoit property limits.

The existing Sanitary Sewer System within this area is owned and maintained by the Town of Irondequoit. This system is conveyed via underground pipe along St. Paul Boulevard, and is tied directly to the Town of Irondequoit (Summerville) Wastewater Pump Station (WW PS) (**Figure 5**). Similarly, the existing Storm Sewer System is conveyed via underground pipe in relatively the same area. However, this system all connects back to an underground precast concrete junction chamber that discharges to the Genesee River via a 41"x 53" arch pipe with Tide Flex check valve, directly south of the NYS-DEC Fishing access area. Monroe County maintains this stormwater infrastructure within the existing easement. Final design and project execution will require coordination efforts between the City of Rochester, Monroe County and the Town of Irondequoit to confirm ownership and long term O&M responsibilities.

Additionally, limited utility records were available for the private properties along the Summerville shoreline. As a result, this assessment assumes that Silk O'Loughlin's Restaurant and the USCG Station have independent storm sewer systems and individual outlet pipes that discharge to the River along each respective property.

- Stakeholders and Community Support

Local stakeholder cooperation and community support are essential to the design development and alternative identification. As part of this project, it will be a necessity to establish coordination efforts between not only the property owners, but also through working groups, outside agencies, and public outreach. It is the goal of this report to present preliminary findings, assessments, and engineering alternatives to help facilitate gaining support, public review, and promotion of resiliency.

Figure 5: Local Stakeholders

- Population Trends and Growth

According to the United States Census estimate, the Town of Irondequoit has a current population of 49,927. Between 2010 and 2018, the Town of Irondequoit experienced a population decrease of 3.2%.

2.5 Existing Facilities and Present Conditions

The St. Paul Terminus area currently makes up approximately five acres of land that contains a paved public access road, asphalt parking lots, concrete sidewalk, stone curb, concrete fishing dock, open green space, and roof cover from private and publicly owned property. Along the Genesee River, the majority of the Summerville Lakeshore Pier is retained by steel sheet pile wall overlaid with a concrete cap, with the exception of the docks perpendicular to the MC Sherriff HQ, which are constructed of wood supported by a steel frame. In addition, existing concrete seawalls act as a barrier along the pier from the south end of the NYS-DEC lot to the north end of the USCG. Preliminary field observations and investigations reveal that the walls were constructed at different times from parcel to parcel, in addition to varying in height from 1.75 to 2.75 feet. Due to limited as-built drawings for the area along the shore, this report assumes the entire length of the existing Summerville Pier is constructed as depicted per record drawings from the Rochester Harbor East Pier Repair Project (see **Appendix B**).

The Site is currently served by municipal domestic water, sanitary, electric, natural gas, and telephone service. Utility records as well as information from "811 Dig Safely" exposed domestic water main owned by Monroe County Water Authority within the vicinity of MC Sheriff Marine HQ and the NYS-DEC Parking area that branches off onto St. Paul Blvd. and up to the USCG. Additionally, gas and electric from RG&E, Frontier Telephone fiber optic cable, and Time Warner Cable fiber optic cable are all shown within the Site boundary.

Site drainage is achieved via overland flow to conventional drainage structures (catch basins), absorbance from impervious surfaces, and closed-conduit (storm and sanitary) sewers along St. Paul Blvd. and Club Terrace.

- Damage History

Periodic flooding along Lake Ontario has caused major disruption to the St. Paul Terminus area. Beginning with the flood of 2017, the existing properties within the Site boundary have been subject to ongoing damage due to the event. During this storm surge, water levels reached a high elevation of 248.95 feet, causing the water within the Genesee River to infiltrate the Summerville Pier and surrounding properties. This was the first realization of the property owners' helplessness to handle the oncoming water, having to utilize temporary measures such as sandbag barriers and portable water pumps in order to prevent further property destruction. Damage due to the flood included but was not limited to: erosion, repair costs, structural flooding, damages to shoreline properties, and sewer backup. Further, due to the area's incapacity to recover from the flood, standing water resulted in an inability for residents to utilize or access the infiltrated land. Examples of the high water level, land coverage, and temporary protection measures along the lakeshore properties are shown in **Figure 6** below.

Figure 6: Flood Damage at NYS-DEC Fishing Access and Silk O'Loughlin's

To further increase the damage, a similar flood event occurred again in 2019 where water levels reached a record high of 249.1 feet, surpassing the current 100-year floodplain elevation for Summerville Lakeshore of 249 feet.

2.6 Definition of the Problem

St. Paul Terminus is a highly developed, topographically low area that is actively utilized by the public. Due to recent climatic events in 2017 and 2019, the area has been subject to rising water levels of Lake Ontario, and as a result has required flood breach protection and repair. The shoreline, building and drainage infrastructure is highly susceptible to rapid and dramatic changes in water levels that has local residents and public authorities concerned about its long-term sustainability and resilience. Specifically, the community and project stakeholders want to better understand the long-term effects and solutions for the area in terms of property damage, water quality, and future functionality of the area and surrounding residences. It is clear that the periodic breaching of the area will in turn trend toward closure of shoreline properties, and have long lasting negative effects on the residents if no management or protective action are taken. For these reasons, the best available data shall be utilized to identify and evaluate design alternatives for the ongoing flood impacts on St. Paul Terminus and the surrounding area. Overall, the ideal solution for the project's problem statement will incorporate the following:

  - » Ensure human health and safety
  - » Minimize damage to public / private property in the area
  - » Maintain functionality of shoreline security, continued fishing and boating access
  - » Maintain public access to the area
- Flood protection, health, and sanitation

Historically, as well as in accordance with Town, City and Monroe County personnel, flooding and compromised drainage infrastructure (and water quality) have been issues of concern within St. Paul Terminus. Based on publications within the media and observations in the field, the area has been subject to property damage since the flood event in 2017. The majority of this damage was caused by water, either by waves, storm surges, or assets being under water for long periods of time. Flooding and lack of adjacent flood protection infrastructure has also led to potential inoperability of the area. Additionally, high volumes of water have contributed to backed-up storm and sanitary systems, which causes great concern for future issues related to health and sanitization. These impending issues include but are not limited to mold and structural damages to adjacent buildings, as well as negative effects to the water quality in the case that the sanitary sewer overflows and/or is compromised.

- Aging Infrastructure

The project area is primarily occupied by infrastructure. However, a high percentage of this infrastructure was constructed over a decade ago. Based on available utility records, a majority of the public storm systems, sanitary systems, and seawalls have not been modified since the late 1990s, if not constructed much earlier. The existing infrastructure was not built in anticipation of water levels higher than that of the FEMA 100-year floodplain. The age of the infrastructure in combination with exposure to future flooding makes it an ideal candidate for revitalization.

- Storm & flood resiliency

Although the existing St. Paul Terminus is presently designed in compliance with current design regulations, as well as accounts for protection against FEMA 100-year floodplain elevation 249 feet for the Genesee River, it is frequently affected by storms, changing water levels, amount and duration of ice cover, and dredging maintenance and management activities. As the project site currently stands, it is very exposed and vulnerable to extreme weather, such as storm surge and flooding impacts, especially the areas closest to the east Summerville shoreline (**see Figure 7**). It is clear that the existing sewer systems in place are ill-equipped to handle recent and future rising water levels. Additionally, it is noteworthy to mention that low water levels also pose potential damage with respect to deterioration of water quality, reduction of water in rivers and lakes, and land subsidence within the area.

Figure 7: Flood Inundation Map for Lake Ontario Base Flood Elevation (250 Feet)

2.7 Financial Status

Projects that seek to recover from flood impacts, as well as mitigate flood damage in the future, require several different sources of funding in order to plan the project, develop alternatives, develop 100% construction plan sets, and fully construct and implement. For instance, this report serves as a project alternatives development and is funded by DASNY, with oversight from the NYSDOS.

The project will be financed by the City of Rochester and 95% of the cost will be reimbursed by the REDI Program. The Minimum Required Local Share (5%) will be provided by Monroe County, the Town of Irondequoit, and/or the City of Rochester. The proposed financing plan is shown in the Table 2.7.1.

Table 2.7.1 – Project Financing Plan

Description	Cost
MO-03 St Paul Terminus	
Total Estimated Project Cost	$1,770,000
REDI Grant Amount	$1,681,500
Minimum Required Local Share	$88,500
MO-09 NYSDEC Fishing Access	
Total Estimated Project Cost	$326,000
REDI Grant Amount	$309,700
Minimum Required Local Share	$16,300

The City of Rochester will work closely with other project partners including Monroe County, Town of Irondequoit, New York State and the US Government as applicable to develop an intermunicipal agreement and cost sharing approach for project components within the jurisdiction of each entity. This approach will be developed during final design.

3. RESILIENCY

According to the Resilient Design Institute, resilient design is "the intentional design of buildings, landscapes, communities, and regions in order to respond to natural and manmade disasters and disturbances-as well as long-term changes resulting from climate change." For the design of this project, increased resiliency and sustainability are the two main components that are considered in order to ensure the safety, longevity, and steady growth of the community now, and in the future. Additionally in conjunction with the goals of the Community Risk and Resiliency Act (CRRA), this design approach works to evaluate and account for current and future flood hazards for major projects in New York State.

As the project will be funded by the REDI Program, the development and execution of alternatives ultimately strives to achieve more economically, communally, and ecologically resilient conditions wherever it is possible. This means building resilient alternatives as opposed to traditional approaches for site design, protection from flooding, erosion, and extreme events. In order to work towards this goal, alternatives shall be validated feasible based on the incorporation of protection of assets, protection of the community and its ability to recover from natural disaster, as well as nature-based protection and added natural features.

For the reason that St. Paul Terminus is currently highly exposed and defenseless to flooding and extreme events along Lake Ontario, designing a more sustainable and proactive solution will increase resiliency by better protecting the community from flood hazards and sewer system backup, and by preserving manmade infrastructure, enhancing natural infrastructure, and protecting water quality in and adjacent to the project site.

4. COMMUNITY BENEFIT

Protecting and strengthening the infrastructure within the boundary of St. Paul Terminus will provide multiple community benefits including:

- Enhancement and preservation of the infrastructure within the area.
- Maintain Wastewater Pump Station Operation for health of residents.
- Maintain access for residents to RTS Summerville Loop Bus Station.
- Maintain functionality of shoreline security (Monroe County Sheriff and Coast Guard units), as well as public/boating safety.
- Maintain social benefit from communal access to the waterfront and its' recreational amenities (i.e. Scenic view, fishing access, bar and restaurant, etc.)
- Long-term economic benefits and resilience to residence along within and surrounding the St. Paul Terminus area.

5. ECONOMIC BENEFIT

During the high water levels of 2017, and most recently May 2019, heavy flooding plagued the Summerville shoreline and surrounding St. Paul Terminus area. Damages included, but were not limited to: repair costs, erosion, structural flooding, damages to shoreline properties, and sewer system backup. During the heavy flooding events, the properties directly adjacent to the Genesee River are most vulnerable and likely to be impacted by the flood. Protecting these properties by strengthening the infrastructure and increasing sewer capacity will protect St. Paul Terminus and its residents along the shoreline from future asset damage. Additionally, increased resiliency will not only reduce future damage costs, it will work to reduce costs related to reactive flood protection (labor, sandbags, portable pumps, and temporary dams).

6. PERMIT AND REGULATORY COMPLIANCE

A preliminary list of permits required for the completion of each alternative has been identified and is presented in **Table 6.1**. Please note, the table is for reference only and should not be considered final. Other potential regulatory / permitting authorities which may be relevant to this project include the U.S. Coast Guard, the NYS Department of Transportation, and the NYS Department of Health. Permits and authorizations will ultimately depend on the final proposed design and project sponsorship.

Table 6.1: **Preliminary Permitting Requirements**

Agency	Permit	Regulated Activity
U.S. Army Corp of Engineers (USACE)	Federal Waters / Wetlands Permit	Work and structures that are located in, under, or over federal navigable waters and federal jurisdictional wetlands. Regulatory authority is under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act
NYS Department of Environmental Conservation (DEC)	Freshwater Wetlands Permit, Coastal Erosion Hazard Area (CEHA) Permit, Article 15 Protection of Waters Permit, Water Quality Certificate, State Environmental Quality Review Act (SEQRA), Temporary Revocable	Work and structures that are located in, under or over waters and wetlands, temporary use of state lands and conservation easement lands, and construction activities involving soil disturbances of (1) or more acres

Agency	Permit	Regulated Activity
	Permit (TRP), and SPDES General Permit for Storm Water Discharges from Construction Activity	
US Fish and Wildlife Services	Consultation	Threatened and Endangered Species Act compliance. Required for work near regulated species
City of Rochester (COR)	Site Plan Review	Review in accordance with Local Waterfront Revitalization Plan and Requirements of Bureau of Planning and Zoning
Local Municipality Level	Article 36 – Floodplain Development and Floodway Guidance, Floodplain Development Permit	Disturbance within a designated 100-year flood zone. May require H&H analysis as part of floodplain review by DEC
Monroe County Division of Pure Waters	Sanitary / Storm Sewer Permitting and Plan Approval	Alterations to sanitary / storm sewer system and land/pavement restoration
NYS Department of State (DOS)	Federal Consistency Review – Authorization of USACE and other federal permitting – Consistency of all federal and state permit actions with the enforceable policies of the NYS Coastal Management Program, the City of Rochester federally approved LWRP, and the Town of Irondequoit federally approved LWRP. Additionally, the St. Paul Terminus area involves the Genesee River, which is a state designated Significant Fish and Wildlife Habitat (SCFWH) and therefore must be evaluated for consistency with Policy 7 of the NYSCMP and any corresponding LWRP policies	Conformance with NYS Coastal Management Program or LWRP
NYS Office of General Services (OGS)	Authorization – includes a potential permit issuance of a license; or, letter of no permit required	State lands now (or formerly) underwater
NYS Office of Parks, Recreation, and Historical Preservation	Consultation	Review under Section 106 of Historical Preservation Act State Historic Preservation Law 14.09 (satisfied if section 16 is satisfied)
Town of Irondequoit	Sanitary / Storm Sewer Permitting and Plan Approval	Alterations to sanitary / storm sewer system and land/pavement restoration

Preliminary findings indicate that the project area will be less than an acre of land disturbance, however final SWPPP requirements shall be determined for final proposed design.

7. ALTERNATIVES ANALYSIS

For the purpose of developing flood risk management design solutions, key project goals were identified based on a preliminary assessment of stakeholder/community needs and benefits. These goals are listed below:

- Minimize damage to property and infrastructure, both public (NYS-DEC, MC, TOI, COR) and private (shoreline property owners and residents).
- Protect human health and safety.
- Maintain continued fishing access along pier (NYS-DEC and City of Rochester) and boat access (MC Sheriff Marine HQ and U.S. Coast Guard).
- Maintain continued access to residents via RTS Summerville Loop Bus Station.
- Maintain, protect, and enhance natural habitat areas.
- Verify feasibility of implementation.

Unless a no action alternative is selected (that is to leave the site as it is in existing conditions), these goals create the need to generate an alternative, which will likely be a hybrid of various options.

Moreover, this report presents and evaluates a total of six alternatives that have been developed to achieve a balance of these key project goals in combination with increased resiliency and minimization of costs. These preliminary alternatives vary from no action, to natural solutions, to hardened alternatives. The six alternatives developed are as follows:

1. **Alternative A**: No action. Do nothing and leave the status quo.
2. **Alternative B.1**: Public Storm Sewer System Modifications. Create additional stormwater storage capacity by implementing a Stormwater Pump Station and providing additional storm drains within Club Terrace area. Reroute pipe to public discharge outlet and install permanent check valve on existing storm sewer discharge.
3. **Alternative B.2**: Private Storm Sewer System Modifications. Create additional stormwater storage capacity by implementing Stormwater Pump Stations at both Silk O'Loughlin's Restaurant and the USCG Station. Route PS pipe to private discharge outlets and install permanent check valves on existing storm sewer discharge for each location.
4. **Alternative C**: Fortification by Floodwall Extension. To extend and/or resize existing concrete sea wall along the eastern shoreline, providing removable stop logs and portable dams for open access to pier and docks.
5. **Alternative D**: Fortification by Berm Structure at NYS-DEC Fishing Access Area. To implement a berm structure along the dock and parking lot edges surrounding the NYS-DEC fishing access area.
6. **Alternative E**: Upgrade Summerville Waste Water Pump Station. Provide necessary flood proofing improvements to existing WWPS.

It is important to note that these alternatives, and respective evaluations, are based on conceptual designs as described in the sections that follow. Further, these designs only reflect a schematic level of design to represent varying types of management activities. Any implemented project would still require detailed design prior to permitting by any local or federal regulatory agency to ensure all applicable requirements are met.

7.1 Alternative B.1

- Site Location

The proposed location of the St. Paul Terminus Storm Water Pumping Station (SWPS) is near the Rochester Yacht Club, at the intersection of St. Paul Blvd and Club Terrace. The SWPS is meant to serve the area adjacent to the Yacht Club and the Westage at the Harbor Condominium Complex. The approximate location of the pump station is shown in the **Figure 8** below.

The St Paul SWPS is being proposed as part of a number of upgrades in this location. Other alternatives will include the construction of new seawalls located on the river side of the SWPS to keep flood water from breaching the area. Along with the seawalls, new permanent check valves will be installed on existing discharge lines. The proposed SWPS will provide storm and flood resiliency and allow for this area to drain properly during future storm events. A new SWPS and storm drain collection system is proposed for the area.

- Design Flows

To date, no direct flow monitoring study has been completed for this area. In order to approximate potential storm event flows that could be seen by the collection system, Popli Design Group compiled NOAA precipitation return frequency estimates for the city of Rochester, NY area. The NOAA data presents a predicted average amount of rainfall (in inches) for a specific duration and storm return interval. Without any additional data available, potential storm flows were calculated with the conservative analysis of a 100-yr storm event lasting for 12 hrs. An additional adjustment was made to incorporate the amount of pervious surface located in this area. For these calculations it was assumed that pervious surfaces could affectively handle up to approximately 25% of the total predicted rainfall. The table below shows the design storm, amount of predicted precipitation, and the total amount of predicted flow on the area in question.

Table 7.1.1: NOAA Return Frequency Rainfall Data for 100-yr Storm in Rochester, NY

Duration	Rainfall (in)	Ft^3	Gallons	GPM	25% GPM Reduction
6-hr	3.49	47,103	352,333	245	184
12-hr	4.06	54,796	409,878	285	213
24-hr	4.64	62,625	468,432	325	244

- Pump Station Location and Collection System

The proposed SWPS will be located in the grass median in the center of the project area. The space is currently relatively open with a tree and some overhead power lines in the vicinity. The proposed location is on Town of Irondequoit property and an easement will be required if the facility were operated by another entity. It is anticipated that the majority of equipment will be placed below grade and out of site from the roadway, but there will need to be some equipment, like control panels and electrical equipment, that will be installed above grade. Fencing or some other additional security should be installed around the SWPS along with access for maintenance vehicles.

However, as the project site is an active, scenic area for the public to utilize, it is important to recognize that the location of the proposed SWPS in the middle of the island will compromise the aesthetic view of and approach to the river. In order to mitigate this impact, the final design should explore alternative locations where this facility would be less obtrusive.

With a central location for the SWPS, a new storm water collection system can be installed in the surrounding streets. Existing storm drain inlets will be rerouted to the proposed SWPS with strategically placed additional inlets installed at various locations within existing easements or right-of-way. Existing pervious areas can be left to absorb as much rainwater as possible and help reduce the amount of inflow required to be pumped out of the SWPS and back to the river. A conceptual layout of the proposed stormwater collection system is shown below (**Figure 8**), where the proposed discharge pipe is proposed to outlet at the MC Sheriff Marine HQ boat slip.

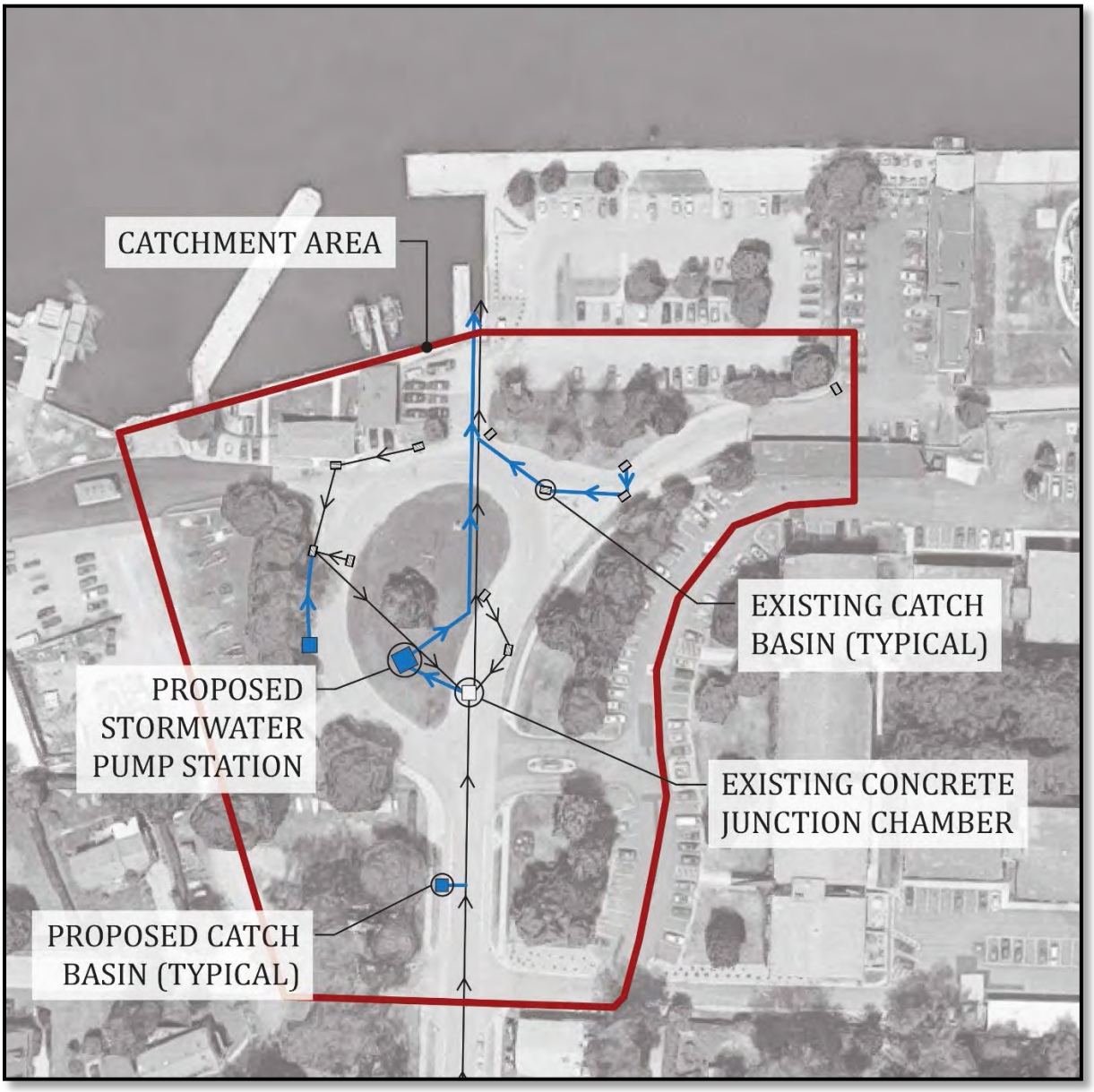

Figure 8: Conceptual Layout of Stormwater Collection System

Further, in order to eliminate the need for another check valve, it is recommended to route the proposed discharge pipe above ground for outflow above the water level at the river. A potential configuration of the discharge pipe to the Genesee River is shown below (**Figure 9**).

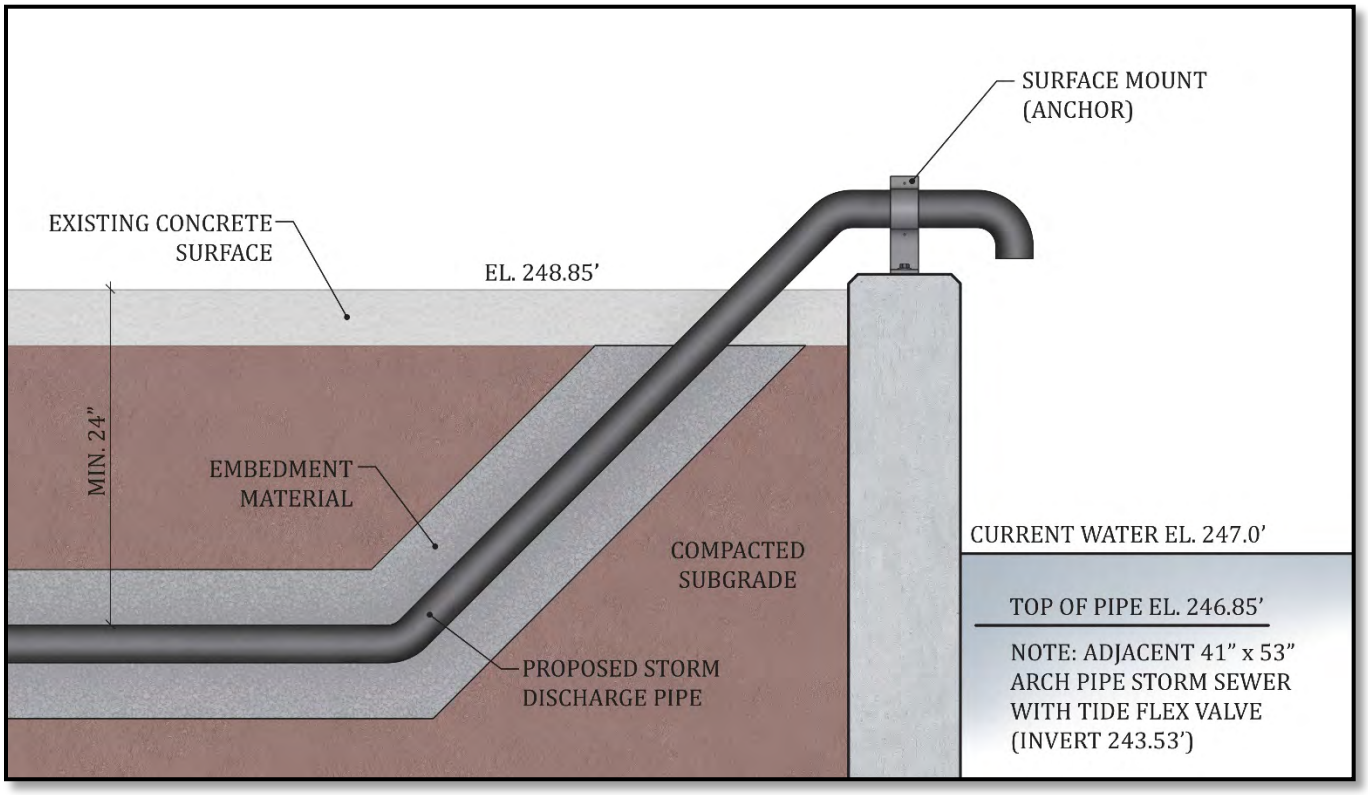

Figure 9: Section of Pump Station Discharge Pipe to Genesee River

For this report, it was assumed that the MC Sheriff Marine HQ boat slip shown is not being used, as it is currently encumbered by the existing stormwater outfall check valve in addition to being blocked off by a chain link fence (**Figure 10**). However, utilization of the boat slip shall be confirmed prior to executing the final design.

Figure 10: Existing Stormwater Outfall

- Pump Station Design

The SWPS design includes the installation of a circular precast concrete or steel structure with a depth of approximately 10 feet to provide an adequate sump below the lowest invert of the stormwater collection system. Final depth of the station will be determined during final design and take into account constructability of the system given groundwater depth. Two submersible pumps will be installed at the bottom of the wet well. Each pump will be capable of handling the entirety of the design flow, creating full redundancy in the SWPS. The submersible pumps will be installed along guide rails that allow operators to easily remove the pumps from the station using a portable crane.

Piping from each of the submersible pumps will be routed through an adjacent, below ground valve vault. Each pump will include a check valve for pump protection, and an isolation valve to allow maintenance on the station. Downstream of the isolation valves the pipes will be manifolded together and a single discharge pipe routed to a location in the river. An additional check valve may be installed on the discharge line closer to the river discharge location.

The precast concrete or steel wet well will be accessed through at a minimum, two water tight hatches. A ladder will also be installed within the structure to allow access for maintenance and cleaning. The station will be controlled through level sensors (floats or level transmitters).

Electrical motors will be premium high efficiency type, with one common specification for all NEMA frame motors. All electrical equipment outside of the pump motors will be located on an above grade slab located adjacent to the PS. Electrical equipment includes the pump control panel, disconnect switches, lighting controls and an available portable generator connection.

The SWPS design will consider redundancy and reliability as much as practical. The control panel will house an Uninterruptible Power Supply (UPS) that will protect the control system against line frequency variations, power line noise voltage transients, and will provide voltage regulation and back-up power for a minimum duration of 15 minutes.

A generic layout of the pump station as described is shown below.

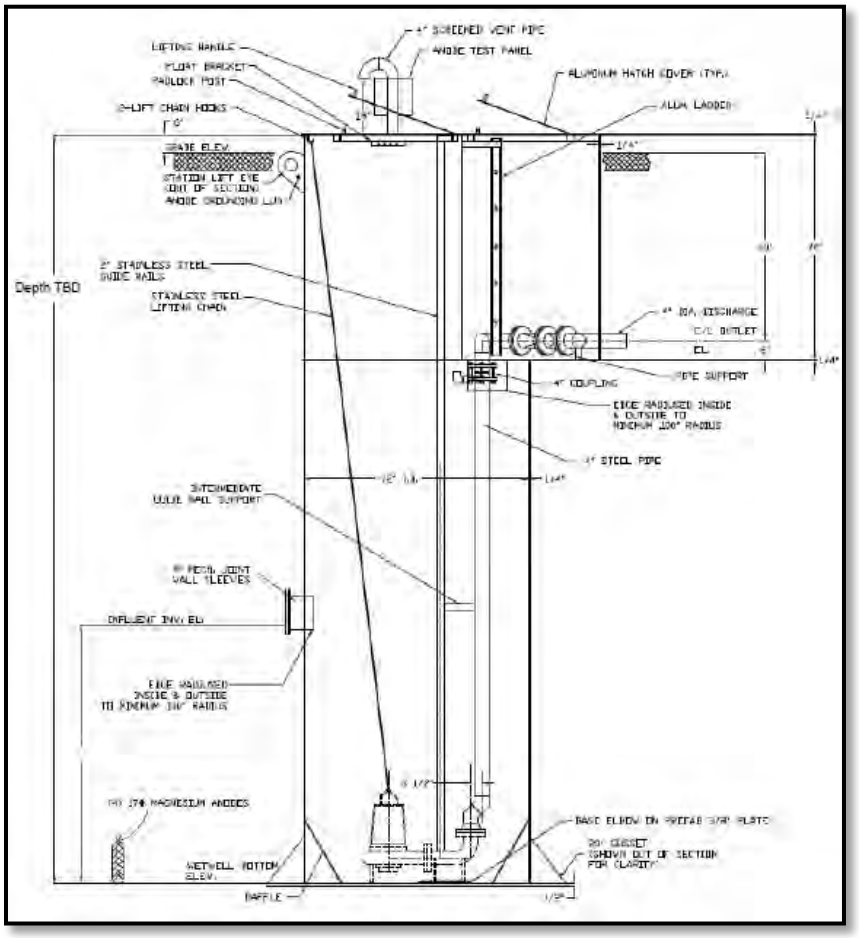

Figure 11 - Cut Section of Proposed SWPS

It is recommended that the SWPS be procured as an entire pre-built system. The SWPS can be manufactured offsite and delivered as a single unit for installation. All pumps, piping, electrical and controls can be installed prior to delivery and installation if a pre-built system is procured. Procurement in this manner will allow for faster lead times, easier construction and more control over the quality of the product and may also lower overall costs associated with the system.

As Monroe County will possibly be the long-term owner of this pump station the design will follow applicable Monroe County standards relative to materials of construction, pumping systems, backup power, controls, safety and access for operation and maintenance. Development of wetwell diameter, depth and sump volume will be completed during the detailed design stage and account for basis of design stormwater flows and constructability.

7.2 Alternative B.2

- Site Location

For the purpose of providing additional flood protection for adjacent property owners, a stormwater pump system is recommended for the parking area at the Silk O'Loughlin's Restaurant and the U.S. Coast Guard Station. It is important to note that because these parcels make up less area, and presumably indirectly connected the public system, these stormwater pump basins will serve as a backup measure. These systems would be comparable to the proposed St. Paul Terminus Stormwater Pump Station, but on a significantly smaller scale and more amenable to prefabricated systems. As an alternate to permanent systems, temporary submersible pumps can be used for short term water control.

- Design Flows

Similar to the calculations for the St. Paul Terminus Storm Water Pumping Station, potential storm flows were determined based on compiled NOAA precipitation return frequency estimates and the respective catchment areas for Silk O'Loughlin's and the USCG Station. The tables below show the design storm, amount of predicted precipitation, and the total amount of predicted flow on the respective areas in question.

Table 7.2.1: NOAA Return Frequency Rainfall Data for 100-yr Storm in Rochester, NY- Silk O'Loughlin's

Duration	Rainfall (in)	Ft^3	Gallons	GPM	25% GPM Reduction
6-hr	3.49	10,135	75,815	52	39
12-hr	4.06	11,790	88,195	61	46
24-hr	4.64	15,021	112,365	78	58

Table 7.2.2: NOAA Return Frequency Rainfall Data for 100-yr Storm in Rochester, NY – USCG Station

Duration	Rainfall (in)	Ft3	Gallons	GPM	25% GPM Reduction
6-hr	3.49	17736	132,674	92	69
12-hr	4.06	20,632	154,338	107	79
24-hr	4.64	23,587	176,443	123	92

- Pump Basin Location and Collection System

At Silk O'Loughlin's, the proposed pump basin will be located on the southern edge of the existing parking lot. Aside from utilization of parking, the space is relatively open with existing catch basins within the vicinity. For the USCG Station, the proposed PS will be positioned in the open green space directly south of the existing parking lot. Due to limited utility / as-built records at the time of this report, further survey and field verification shall be performed to verify the feasibility of these conceptual locations. Additionally, the majority of pump basin equipment will be placed below grade, with the exception of control panels and electrical equipment that will be installed above grade. Concrete filled steel safety bollards or security fencing should be installed around each pump for further protection.

At each location, existing storm drain inlets in the respective areas will be rerouted and connected to the proposed pump basin. For the purpose of reducing the amount of proposed drainage pipe, it is recommended to locate each pump basin within relatively close proximity to the river and existing collection system.

- Pump Basin Design

The design includes the installation of a fiberglass reinforced plastic (FRP) basin. Since the location of each PS is within direct locality of the floodplain, the design shall include anti-floatation measures. Two submersible pumps will be installed at the bottom of the basin. Each pump will be capable of handling the entirety of the design flow, creating full redundancy in the PS. Additionally, the pump basin will be sized appropriately per the predicted flow and cycle time of the selected duplex pump system.

The pump basin will be accessed through a watertight aluminum hatch. The station will be controlled through level sensors (floats or level transmitters at owner's request).

Electrical motors will be premium high efficiency type and all electrical equipment outside of the pump motors will be located on an above grade slab located adjacent to the PS. Electrical equipment includes the pump control panel, disconnect switches, lighting controls, and high water alarm. The control panel will house an Uninterruptible Power Supply (UPS) that will protect the control system against line frequency variations, power line noise voltage transients, and will provide voltage regulation and back-up power for a minimum duration of 15 minutes.

The discharge pipes for each respective property will discharge below water level along the pier. For this reason, Tide Flex type check valves will be provided at each outlet to prevent backflow within each collection system.

7.3 Alternative C

The objective of this project is to not only provide a solution that will allow proper drainage during a flood, but to also provide resiliency by protecting the area and the existing and proposed drainage infrastructure. A concrete seawall set at the appropriate height along the shoreline will protect the St. Paul Terminus from current high water levels and anticipated rising levels in the future.

- Design High Water Elevation

In order to provide an efficient and resilient protective barrier, it is necessary to define the high water elevation that will withstand anticipated heavy rain events. For the purpose of this assessment, the high water elevation is assumed to be 250.0 feet, as this elevation demonstrates the combined risk from both the Genesee River (BFE 249 feet) and Lake Ontario (BFE 250 feet). The top of wall must be designed to meet this water level with additional safety considerations. *Freeboard* is a term used by FEMA's National Flood Insurance Program (NFIP) to describe a factor of safety usually expressed in feet above the 1-percent-annual-chance flood level. Incorporation of freeboard into the design provides a margin of safety against extraordinary or unknown flood risk; wave heights and generally ensures easier and faster cleanup after a flood event. With respect to this assessment the freeboard to be incorporated is 3 feet above the high water elevation, which is equivalent to 4 feet above existing grade. Therefore, the top of wall is established to be 253.0 feet. For the final proposed design, these elevations must be confirmed through future studies, calculations, and/or local stakeholder approval. Additionally, the City of Rochester Flood Plain Manager has been consulted for this project and will be involved throughout the design process.

- Wall Location

The proposed location of the seawall will be along the edge of the Summerville Lakeshore, as this is the most vulnerable to flood impact. Based on available records and analysis of recent field spot elevation checks, this report identifies a conceptual layout for the seawall with the intention of protecting shoreline assets, incorporating resiliency, and remaining cost effective. Additionally, removable stop log barriers will be installed along the seawall to serve as flood gates in order to maintain access to the pier. Conceptual locations of the stop log barriers have been provided for the purpose of developing a cost estimate, however final location, quantity, and product is to be decided by property owners.

The proposed seawall will be installed along the pier of the MC Sheriff Marine HQ, as there is no current protection in this area (**Figure 12**). The existing dock elevation is 249.23 feet (to be verified), leaving the building and surrounding infrastructure heavily exposed in the event of a flood. Existing topography shows that the surface elevation increases going south along the pier in this location. Accordingly, it was determined feasible to terminate the wall just south of the wooden dock. Additionally, as the surface elevation increases towards the south, the exposed area along the pier between the MC Sheriff Marine HQ and the Rochester Yacht Club shall be regraded to raise contours to 253.0 feet elevation and blend back into the surrounding areas. Currently, the existing edge of the dock west of the MC Sheriff Marine HQ building contains multiple boat lifts and surface appurtenances. Therefore, to avoid these features, the most optimal location for the proposed wall is approximately ten feet in from the water edge – along the existing edge of lawn.

Preliminary conversations with the MC Sheriff Marine HQ noted a preference for minimal openings along the proposed wall, including those for stop log barriers. As a result, the conceptual plan for this area proposes two stairways to provide access over the wall to their boat launch area. As this is along a river edge, the stairs are proposed to be aluminum with serrated treads to provide pedestrian safety and skid resistance. The final detailed design of the stairway shall be in compliance with the International Building Code for means of egress.

From the pier of the MC Sheriff Marine HQ, the proposed wall will continue along the southern and western edges of the NYS-DEC fishing access area (**Figure 13**).The final conceptual location of this wall was developed based on several factors, with the highest priority being to determine a resilient option that would maintain the usability of the fishing dock area.

Currently the top of wall elevation of the existing wall along the western edge of the NYS-DEC parking lot ranges between 250.70 and 251.53 feet (to be verified). This elevation is satisfactory for the current BFE, but does not compensate for additional freeboard requirements. Therefore the entirety of the wall would require removal and replacement in order to meet the established top of wall elevation. However, removal and replacement of this existing wall would not maintain the functionality of the fishing dock, and instead would potentially cause closure of the fishing area even if the parking area remained dry. If this were to be proposed, when the water level rises above the existing bulkhead the fishing area would be flooded and unusable. Additionally any fishing off of the wall would be

impeded by the existing cable railing at the river edge, 10-15 feet in front of the proposed wall. This could pose a dangerous situation for anglers, where in which they might jump the wall to get closer to the river and could slip on the concrete or misjudge the dock edge.

In order to avoid closure of the fishing area, a second option was considered to raise the existing bulkhead at the river edge to meet the proposed top of wall elevation of 253 feet (**Figure 13**). This would be the most optimal location for the proposed floodwall, effectively maintaining the use of the dock, minimizing dangers to fisherman, and reducing wall openings at the site.

For the reason that this area is owned by a public entity, it is required that the final design of the DEC fishing access area meet or exceed the requirements for ADA compliance.

The top of seawall at Silk O'Loughlin's is at elevation 251.0 feet, 2.0 feet lower than the proposed design but above the design flood elevation. As this is area is private property, raising this wall to include full freeboard flood protection is not included within the scope of this project (**Figure 14**). Funding for this undertaking will alternatively be sourced through other programs, and the final location and execution of flood protection measures will be decided by the property owner.

Further, the existing top of seawall along the edge of the USCG ranges between 251.81 and 251.66 feet, approximately 1.5' below the established top of wall but above design flood elevation. The Flood Inundation Map (**Figure 7**) depicts the area where the existing wall is located to be of lower flood risk compare to other area along the Summerville Lakeshore. Therefore the existing wall will remain in place, and raising this wall to include full freeboard protection is not included within the scope of this project. However, the Flood Inundation Map shows heavy flood risk at the location of the existing USCG boat slip, as this area is completed exposed to the Genesee River. For continuous protection along the USCG pier, a seawall is proposed along the perimeter of the USCG boat launch area with a removable stop log barrier on each side, to be determined (**Figure 14**). Further, an aluminum stairway with serrated treads is also proposed for access over the existing and proposed seawalls at the USCG, with the final location to be determined by the property owner.

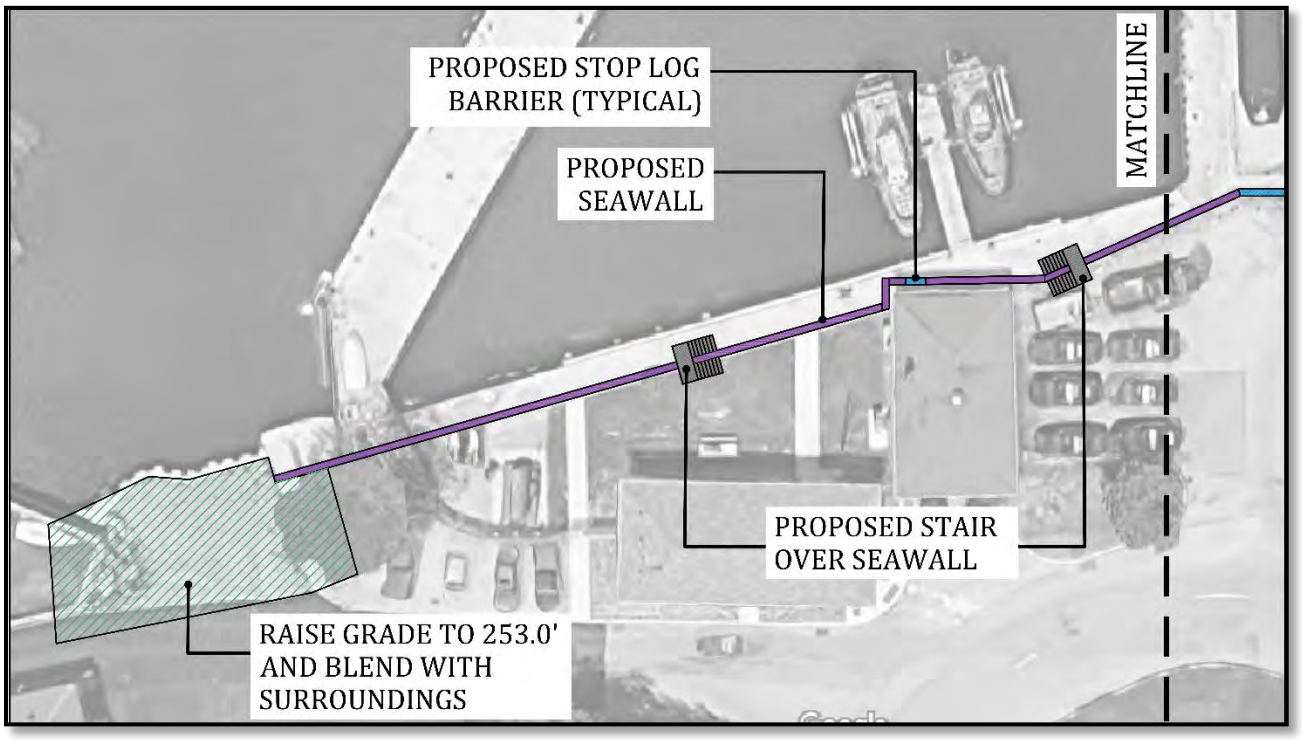

Figure 12 – Seawall Concept Plan A: Monroe County Sheriff's HQ

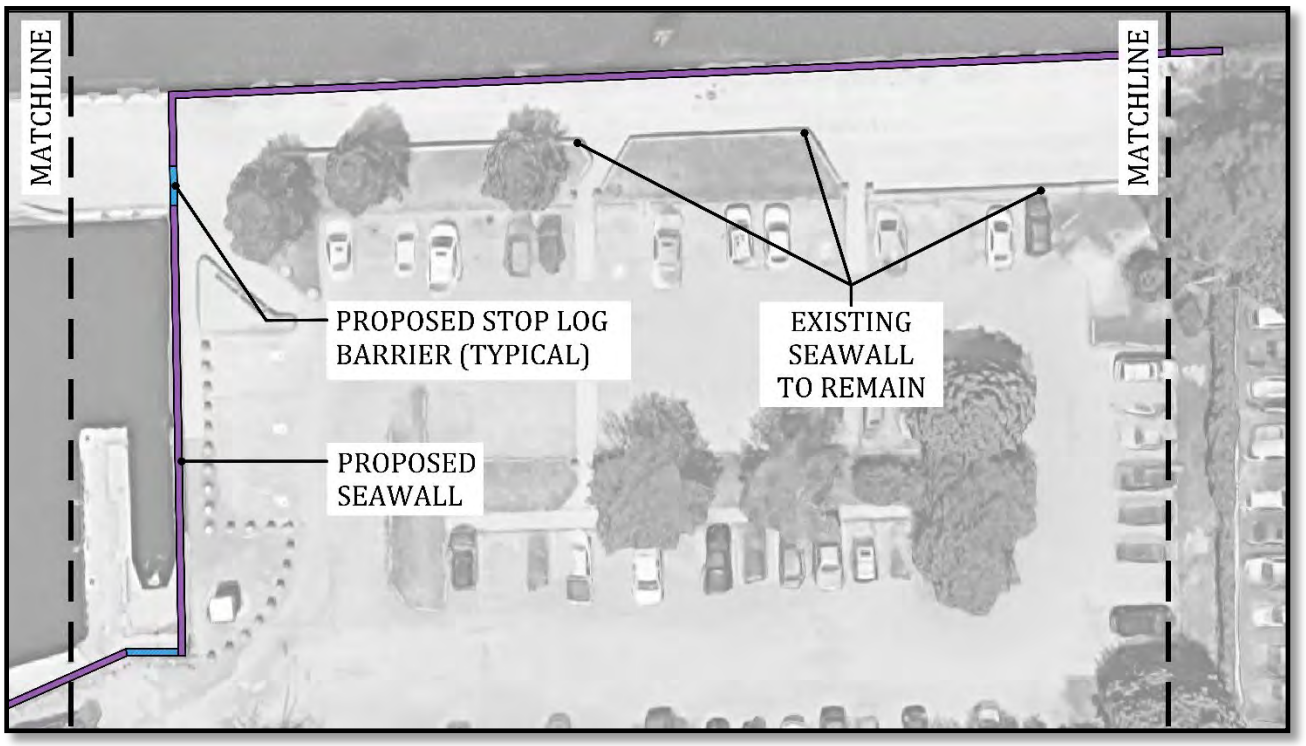

Figure 13 – Seawall Concept Plan B: NYS-DEC Fishing Access Area

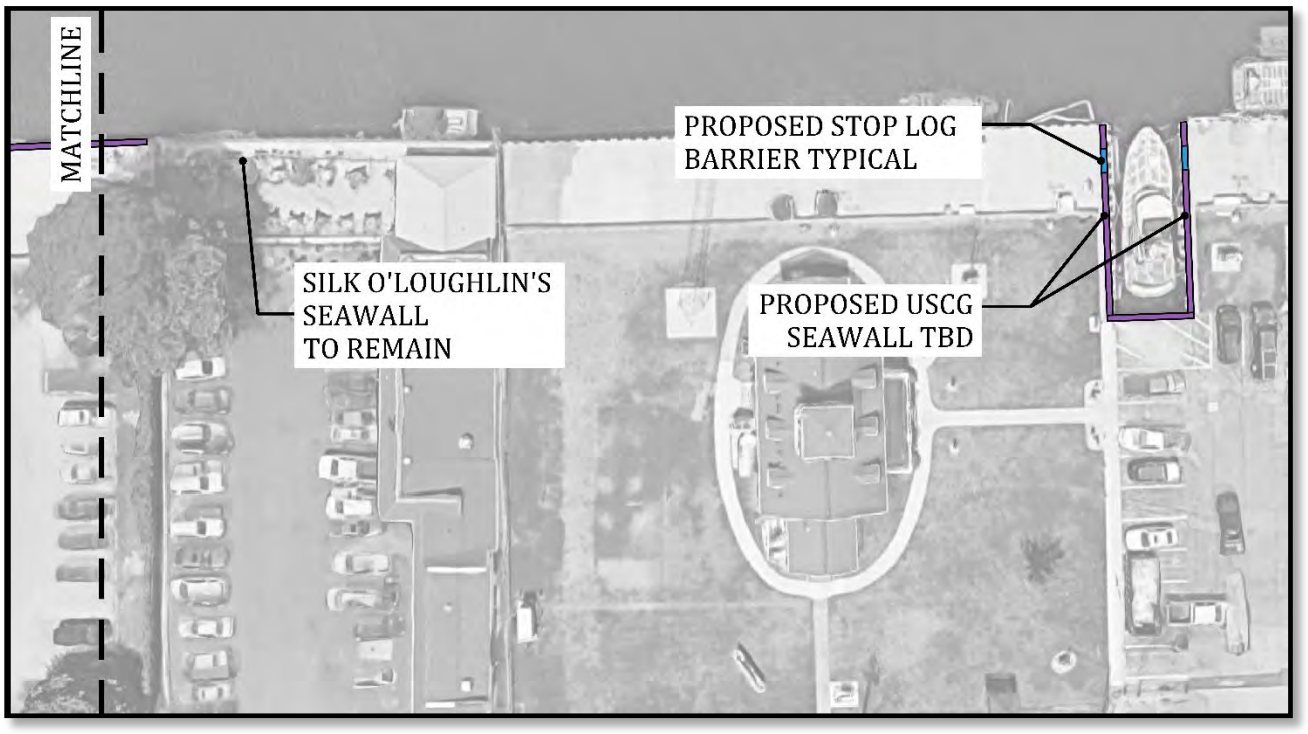

Figure 14 – Seawall Concept Plan C: Silk O'Loughlin's and USCG Station

- Wall Design

The wall design will consider resiliency and longevity as much as practical. The wall shall be composed of cast-in-place concrete, 12" thick, with steel reinforcement to be drilled and grouted into the existing concrete surface (**Figure 15**). The geometry and steel reinforcement will be designed to withstand the hydrostatic pressure associated with the established high water elevation, and with inclusion of the effects of wave action. Additionally, waterstops will be incorporated to prevent leakage between the existing concrete surface and proposed wall. Due to limited access to record drawings at the time of this report, existing conditions of the bulkhead and surrounding area will need be verified in the field before moving forward with the final design of the floodwall.

Stop log barriers will be provided at the same heights as the established top of wall elevation. The stop log openings will be approximately 6 feet wide and of varying height. For ease of installation, it is recommended that the stop logs be provided in 12 inch high increments requiring up to four stop logs per location. The stop logs will be composed of stainless steel, aluminum, or timber, to be mounted to the face of the proposed and/or existing face of the wall (**Figure 16**). Barriers will be mounted to the wall faces via side guides consisting of a metal extrusion with an easily replaceable polymer seating/sliding liner to reduce leakage while installed. Overall, stop log barriers shall be selected based on the ability to provide similar levels of protection to permanent flood defenses, but with the distinct advantage of being fully and easily removable when not required.

Due to the size and material of the proposed stop log barriers, it is important to consider that installation of a large quantity of stop logs may be difficult to manage during an emergency situation. For this reason, other more viable products should be explored to mitigate the manpower needed for installation. These options include, but are not limited to, hinged doors, self-actuated flood gates such as FloodBreak automatic gates, or more permanent means to cross over the proposed walls such as marine dock ramps or stairways. The final estimate in this report includes costs for typical stop log barriers as a base alternative for wall openings as noted in the concept plans above. However, initial research has determined that self-actuated gates are approximately 1.33 x cost of stop log barriers. Discussions with project stakeholders and property owners should serve to confirm owner preferences as well as limit the number of wall openings to the fewest reasonable for the final design.

In the case that self-actuated gates are determined an inviable option, and self-installed stop log barriers are chosen, the final design must include an Emergency Action Plan for deployment of the barriers. This plan shall detail the openings that require stop log barriers, storage of the barriers, and shall clearly state what conditions would trigger installation and the entity responsible. It can be noted that the garage of the MC Sheriff Marine HQ may be a feasible option for storage. However, final determination of storage and the entity responsible for executing the Emergency Action Plan will need to be discussed and confirmed with all stakeholders and property owners during the final design.

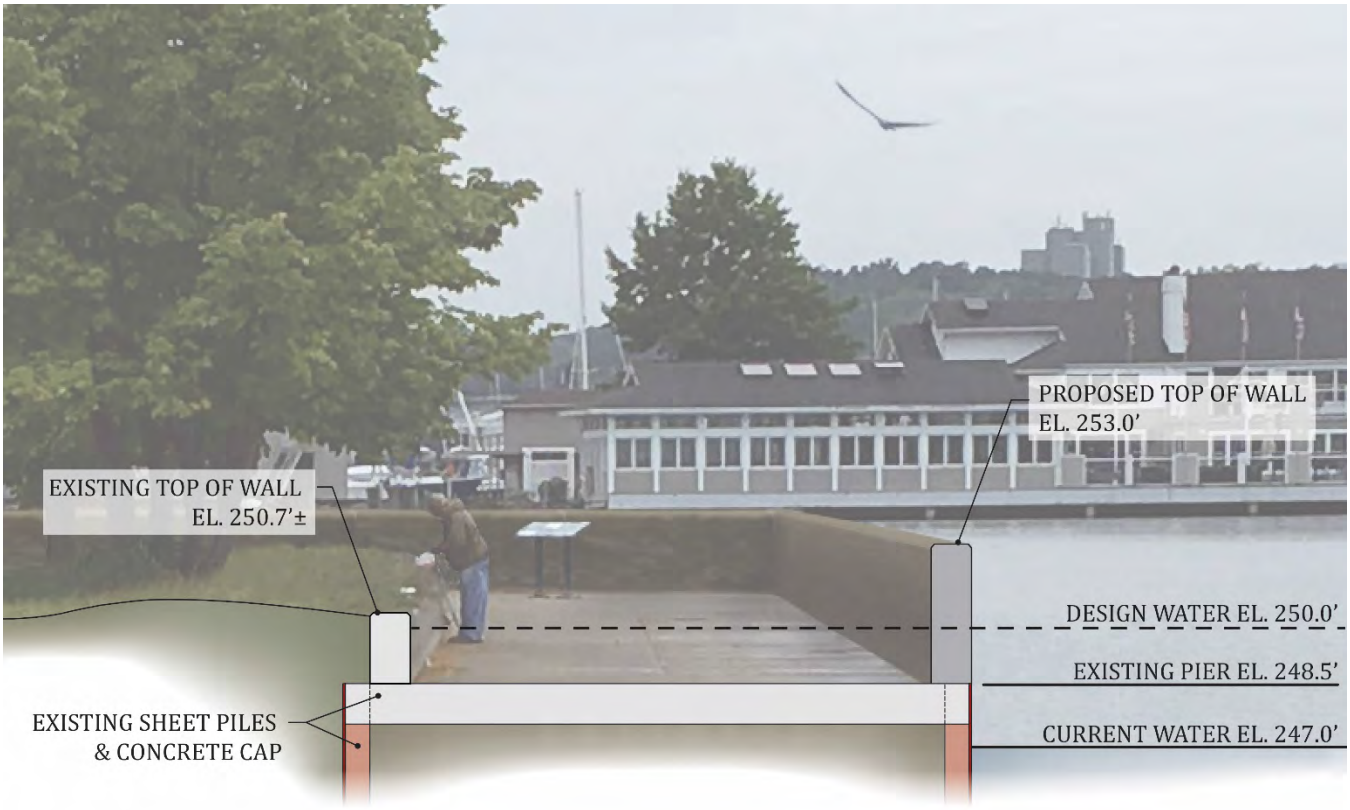

Figure 15 – Typical Section of Proposed Seawall at NYS-DEC Fishing Access Area

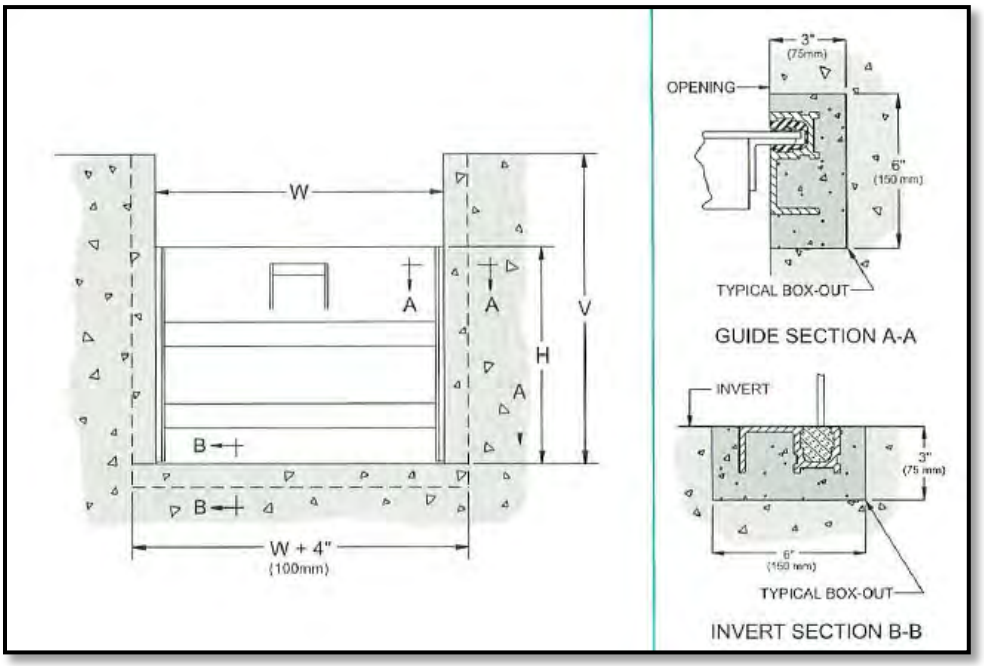

Figure 16 – Typical Stop Log Barrier

7.4 Alternative D

- Berm Structure Location

This modified alternative is presented as an option to Alternative C in order to incorporate a more natural barrier for flood protection. Compared to Alternative C, this alternative proposes a berm structure along the edges of the NYS-DEC Fishing Access Area as substitution for the proposed seawall. Specifically, the berm will be located on the south edge, at the current location of concrete bollards and accessible parking, and on the west edge, on the landside of the existing concrete seawall. It will serve as a fortification line against high water levels. Further, because a berm is essentially a raised barrier composed of earthen material, it will reduce the rate of surface runoff and promote natural water absorption.

Another potential location for the berm structure would be at the gravel pad area, just south of the Monroe County Sheriff Marine HQ. Based on initial conversations with the owner, this area is not currently used for water access, making it a feasible area for a proposed barrier structure. Current survey data for this area is very limited, and as such the extent of this berm and its potential to mitigate flooding the property to the south will need to be analyzed and verified in the final design of this project. Contingency costs for this proposed berm structure and the regrading of the surrounding area have been included within this assessment as part of Alternative C.

- Berm Design

The berm structure will be designed to maintain a top of slope elevation equivalent to the established high water elevation as noted in Alternative 3. The general geometry of the structure will be trapezoidal, and the embankment will maintain a slope of 1:3. Along the south side of the parking lot, the entire structure will be approximately 24 feet wide from the edge of the existing concrete sidewalk, and will tie into the existing top of pavement elevation (**Figure 17**). Along the west edge against the existing wall, the surface will require approximately 2.0 feet of fill to meet the required elevation and will tie into the existing top of wall edge.

Construction of the berm structure will require removal of the existing asphalt surface to create a homogenous profile. However, the existing concrete bollards and wall along the south side may remain in place, and will be covered by compacted soil. In addition, the embankment will be composed of compacted suitable soil material, with embedded rip rap along the riverside to prevent erosion from floods and wave action. As wave action is low in this area, the embedded rip rap may be substituted by vegetation with an erosion control blanket, in conjunction with native plantings to further reduce the cost, promote a more natural solution, and reduce potential hazards due to the riprap (slippery when wet, easy to hurt ankles or knees, etc.) (**Figure 18**).

It is recommended that the fill for the berm be procured from readily available material nearby, possibly from other excavations proposed within the overall project. Procurement through this method will work to alleviate costs associated with hauling suitable material to the site.

Implementation of the berm structures will impact the number of spaces within the parking lot. The structure proposed along the south edge will remove the three existing accessible parking spaces, and the berm structure along the west edge will remove six standard parking spaces in the northwest corner. The final design will need to incorporate striping replacement of the existing accessible spaces elsewhere within the lot, and shall maintain ADA compliance. Additionally, in order to accommodate the berm on the south side, the adjacent curb island will need to be reconstructed to maintain a 24 foot lane for traffic within the lot.

It is important to note that the proposed berm structure on the west edge of the parking lot would also restrict access to the fishing dock in the event of a flood, potentially causing closure of the area and making this portion of the alternative non-resilient.

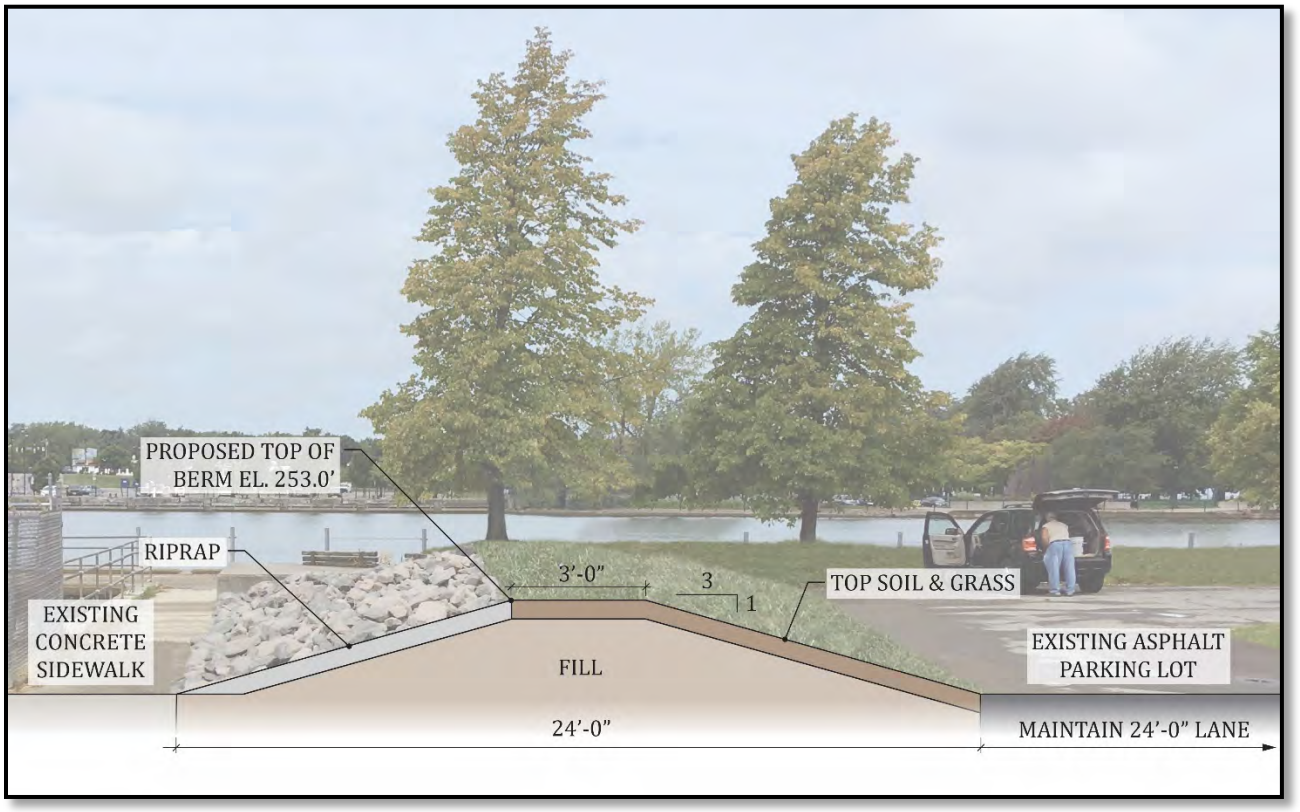

Figure 17 –Section of Proposed Berm Structure at NYS-DEC Fishing Access Area – Riprap

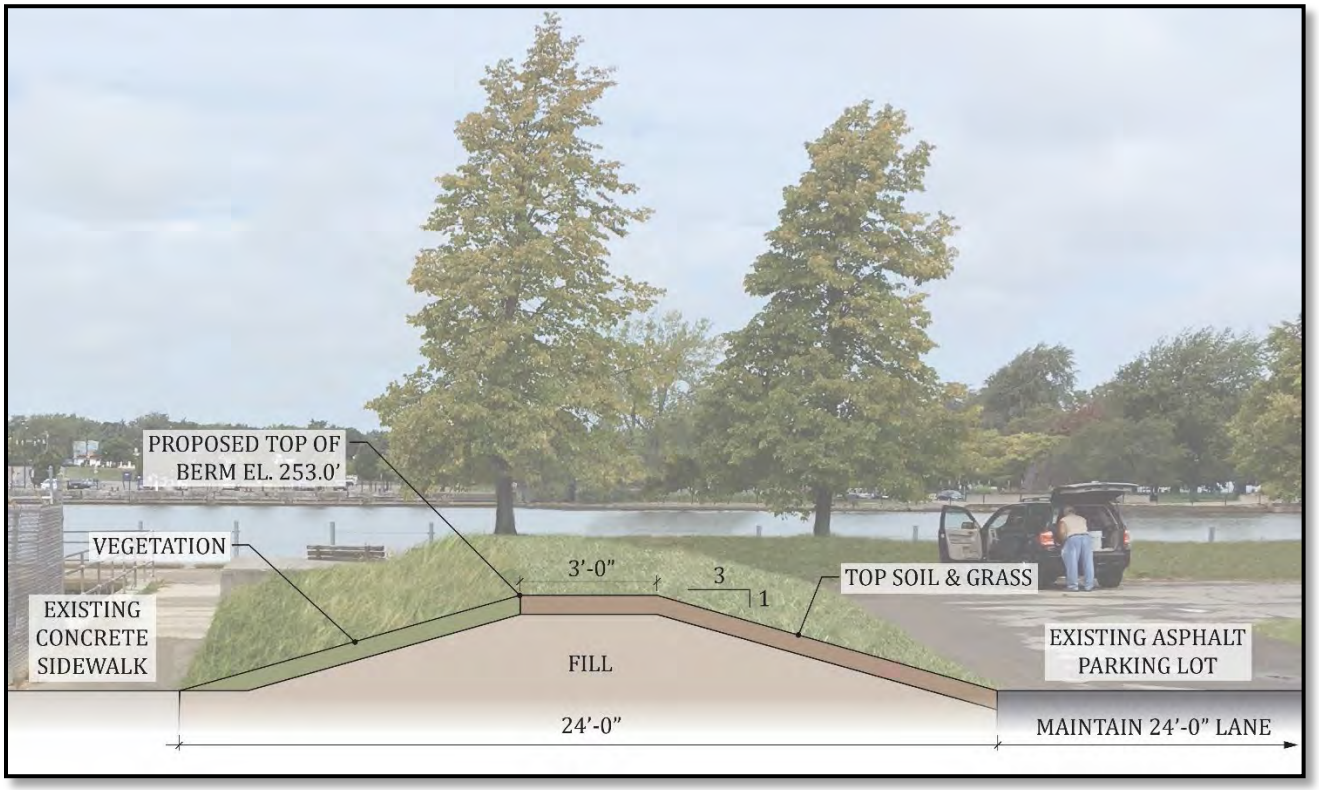

Figure 18 –Section of Proposed Berm Structure at NYS-DEC Fishing Access Area – Vegetation

7.5 Alternative E

The Summerville Wastewater Pumping Station is owned and operated by the Town of Irondequoit and serves the area immediately surrounding the St Paul Terminus including Westage at the Harbor, local businesses, Rochester Yacht Club and residences. Flows reach the pumping station though a series of local collection sewers and the pumping station discharges flow to the Monroe County Pure Waters System in the vicinity of the Pattonwood Pump Station.

Original date of construction is unknown but the pumping station was upgraded by the Town in 1998 to increase capacity and modernize the system. The existing pumping arrangement consists of two Gorman Rupp suction lift pumps, each rated at 750 GPM (approximately 1.08 MGD) located inside of a small building. The finish floor of the building ranges from 250.45 to 251.17 with the pumps located on the upper level. Given the height of the floor, the building is situated such that it will be protected from flooding in the near term provided that adequate protection is in place at the edge of the river and water levels do not reach higher than 250.00.

Town personnel have noted that the station capacity is compromised during high water level conditions, presumably due to the influence of inflow and infiltration due to elevated groundwater and older leaky collection pipes. With the addition of the proposed storm sewer collection system, it is likely that the stormwater influence on the Summerville WWPS will be reduced and some capacity restored. However, these changes may not provide the level of protection necessary to limit surcharging of sewers into basements. In order to provide additional level of protection, modifying the existing duplex pumping system to provide a maximum capacity of 1.5 MGD is recommended. For ultimate flexibility, installation of variable speed drives and level controlled operation to maintain the water level at acceptable elevations below basement levels is suggested. Additional evaluations are recommended to confirm the final design flow rates.

In addition to replacement of the pumping system, protection of electrical elements located at or near flood elevation will need to be completed as well.

7.6 Cost Estimate

Project construction costs were estimated based on conceptualized designs. Rough order of magnitude quantities has been developed and unit costs have been derived from similar NYSDOT item costs, recommended manufacturer costs, and other similar project known costs. The costs are assumed to represent scale differences between the alternatives but are by no means considered accurate for detailed construction estimates. Additionally, the estimates take account of a straight contingency of 30% plus engineering/legal/administration of 25%. No permitting costs have been included.

The following tables summarize the concept level initial construction cost estimates for each of the evaluated alternatives. Additionally, as the project area is being funded through two separate projects –St Paul Terminus (Project MO-03) and NYDEC Fishing Access (Project MO-09), costs have been broken out accordingly:

Table 7.6.1: Alternative B.1 Opinion of Probable Cost

Public Storm Sewer Modifications – Alternative B.1 Opinion of Probable Construction Cost				
St. Paul Terminus (Project MO-03)				
Item/Description	**Quantity**	**Units**	**Unit Cost**	**Total Cost**
Erosion and Sediment Controls	1	LS	$3,000.00	$3,000
Sawcut and Remove Asphalt	1900	SF	$1.50	$2,850
Remove and Reset Granite Curb	92	LF	$8.00	$736
Remove 18” CMP	30	LF	$19.59	$588
Remove Plugged 42” RCP	65	LF	$40.00	$2,600
Workzone Traffic control	1	LS	$1,500.00	$1,500
Strip and Stockpile Soil, 4”	62	CY	$7.20	$440
Excavate to Subgrade	1070	CY	$25.00	$26,717
Subbase Material	243	CY	$40.00	$9,683
Pavement Repair at Trench	1900	SF	$13.00	$24,700

Public Storm Sewer Modifications – Alternative B.1 Opinion of Probable Construction Cost				
Mill & Pave, 1”	525	SY	$4.75	$2,494
Place Topsoil from Stockpile	5000	SF	$0.80	$4,000
Catch Basins, Frames, and Grates	2	EA	$613.46	$1,227
Core Drill Existing Structure	8	EA	$450.00	$3,600
Storm Sewer Piping, 4” DIA. Steel Discharge	250	LF	$48.00	$12,000
Storm Sewer Piping, 12” DIA. HDPE	185	LF	$10.29	$1,904
Storm Sewer Piping, 18” DIA HDPE	60	LF	$18.50	$1,110
Pump Station Package, 500,000 GPD	1	EA	$336,299.10	$336,299.10
			Construction Subtotal =	*$435,000*
			General Conditions and Construction Administration =	$230,000
			Allowances =	$176,000
			Total Estimated Construction Cost =	*$841,000*
			Engineering, Legal, and Administrative (25%) =	$109,000
			Contingency (30%) =	$130,000
			Total Estimated Project Cost =	**$1,080,000**

Table 7.6.2: Alternative B.2 Opinion of Probable Cost

Private Storm Sewer Modifications – Alternative B.2 Opinion of Probable Construction Cost				
St. Paul Terminus (Project MO-03)				
Item/Description	**Quantity**	**Units**	**Unit Cost**	**Total Cost**
Erosion and Sediment Controls	1	LS	$3,000.00	$3,000
Strip and Stockpile Soil, 4”	38	CY	$7.20	$264
Excavate to Subgrade	436	CY	$25.00	$10,880
Subbase Material	62	CY	$40.00	$2465
Pavement Repair at Trench	500	SF	$13.00	$6,500
Place Topsoil from Stockpile	3000	SF	$0.80	$2,400
6” DIA. Bollard, Concrete Filled	8	EA	$765.05	$6,120
Storm Sewer Piping, 2” DIA. Steel Discharge	200	LF	$25.00	$5,000
Check Valves, Tide Flex 12” DIA.	2	EA	$4,000.00	$8,000
Pump Station Package, 100,000 GPD	2	EA	$5050.00	$10,100
			Construction Subtotal =	*$55,000*
			General Conditions and Construction Administration =	$43,000
			Total Estimated Construction Cost =	*$98,000*
			Engineering, Legal, and Administrative (25%) =	$14,000
			Contingency (30%) =	$16,000
			Total Estimated Project Cost =	**$128,000**

Table 7.6.3: Alternative C Opinion of Probable Cost

Fortification by Floodwall Extension – Alternative C Opinion of Probable Construction Cost				
St. Paul Terminus (Project MO-03)				
Item/Description	**Quantity**	**Units**	**Unit Cost**	**Total Cost**
Erosion and Sediment Controls	1	LS	$3,000.00	$3,000
Remove Handrail	50	LF	$15.001.73	$750
Remove Chain Link Fence	130	LF	$15.00	$1,950
Concrete Seawall 12” Thick, USCG	125	LF	$197.90	$24,738
Concrete Seawall 12” Thick, MC Sheriff	250	LF	$197.90	$49,475
Berm / Grading Southwest Area	1	LS	$95,000.00	$95,000
Typical Stop Log Barrier	6	EA	$4,000.00	$24,000
Aluminum Wall Stairway	48	RISER	$435.00	$20,880
			Construction Subtotal =	*$220,000*
			General Conditions and Construction Administration =	$117,000
			Total Estimated Construction Cost =	*$338,000*
			Engineering, Legal, and Administrative (25%) =	$55,000
			Contingency (30%) =	$66,000
			Total Estimated Project Cost =	**$459,000**

NYS-DEC Fishing Access (Project MO-09)				
Item/Description	**Quantity**	**Units**	**Unit Cost**	**Total Cost**
Erosion and Sediment Controls	1	LS	$3,000.00	$3,000
Remove Concrete Seawall, NYS-DEC	65	LF	$146.99	$9,554
Remove Bollards / General Demolition	1	LS	$12,000.00	$12,000
Surface Restoration (Pavement / Turf)	1	LS	$40,000.00	$40,000
Concrete Seawall 12” thick, NYS-DEC	385	LF	$197.90	$76,192
ADA Access (Ramp at Wall)	1	LS	$5,000.00	$5,000
Typical Stop Log Barrier	3	EA	$4,000.00	$9,450
			Construction Subtotal =	*$159,000*
			General Conditions and Construction Administration =	$86,000
			Allowances =	$30,000
			Total Estimated Construction Cost =	*$275,000*
			Engineering, Legal, and Administrative (25%) =	$40,000
			Contingency (30%) =	$48,000
			Total Estimated Project Cost =	**$363,000**

Table 7.6.4: Alternative D Opinion of Probable Cost

Fortification by Berm Structure – Alternative D Opinion of Probable Construction Cost				
NYS-DEC Fishing Access (Project MO-09)				
Item/Description	**Quantity**	**Units**	**Unit Cost**	**Total Cost**
Erosion and Sediment Controls	1	LS	$3,000.00	$3,000
Sawcut and Remove Asphalt	2000	SF	$1.50	$3,000
Remove Chain Link Fence	60	LF	$2.80	$168
Workzone Traffic Control	1	LS	$1,500	$1,500
Strip and Stockpile Topsoil, 4”	30	CY	$7.20	$216.00
Excavate to Subgrade	220	CY	$25.00	$5,500.00
Earth Fill	520	CY	$35.00	$4,200.00
Riprap for Slope Protection	110	CY	$57.77	$14,000.00
Place Topsoil from Stockpile	7400	SF	$0.80	$6,355.00
Stop Log Barrier	3	EA	$18,500.00	$55,500
			Construction Subtotal =	*$99,359*
			General Conditions and Construction Administration =	$81,961
			Total Estimated Construction Cost =	*$181,320*
			Engineering, Legal, and Administrative (25%) =	$25,000
			Contingency (30%) =	$30,000
			Total Estimated Project Cost =	**$236,000**

Table 7.6.5: Alternative E Opinion of Probable Cost

Upgrade Summerville Wastewater Pump Station – Alternative E Opinion of Probable Construction Cost				
St. Paul Terminus (Project MO-03)				
Item/Description	**Quantity**	**Units**	**Unit Cost**	**Total Cost**
Floodproof Electrical System	1	LS	$1,000.00	$35,000
Raise Pumps / Extend Suction	1	LS	$4,000.00	$25,000
Floodproof Manholes	1	LS	$13,000.00	$7,000
Floodproof Building	1	LS	$5,000.00	$8,000
			Construction Subtotal =	*$75,000*
			General Conditions and Construction Administration =	$75,000
			Total Estimated Construction Cost =	*$200,000*
			Engineering, Legal, and Administrative (25%) =	$20,000
			Contingency (30%) =	$25,000
			Total Estimated Project Cost =	**$245,000**

Table 7.6.6: Concept Level Cost Estimate for Proposed Alternatives - Summary

Alternative	Description	Construction Costs	Design and Construction Contingency	Total
St. Paul Terminus (Project MO-03)				
A	No Action	$0	$0	$0
B.1	Public Storm Sewer System Modifications	$841,000	$239,000	$1,080,000
B.2	Private Storm Sewer System Modifications	$98,000	$30,000	$128,000
C	Fortification by Floodwall Extension	$324,000	$116,000	$440,000
E	Upgrade Summerville Wastewater Pump Station	$200,000	$45,000	$245,000
NYS-DEC Fishing Access (Project MO-09)				
C	Fortification by Floodwall Extension	$248,000	$77,000	$325,000
D	Fortification by Berm Structure	$181,000	$55,000	$236,000

- Total project costs listed above include construction costs, non-construction costs, and contingency. Refer to **Appendix A** for final Cost Estimate details.
- Non-construction costs may include land/easement acquisition, legal, engineering, construction management, financial advisor, grant/loan administrator, etc.

7.7 Project Schedule

Strategic project scheduling and adequate lead times are important to implementing projects on time and on budget. When projects are being planned, multiple aspects need to be scheduled, starting with a review of the grantee's municipal procurement practices and a preapplication meeting with the local NYSDEC RPA. A conceptual project schedule based on typical task durations is presented in Table 7.7.1. The pre-application meeting will help set the stage for the rest of the project, including discussions surrounding required permits and design recommendations. Following the pre-application meeting, preliminary design and permitting can begin. Because permitting is dependent on project complexity, disturbance type, and locations within navigable waters of the United States, adequate lead time is recommended. While the permitting process is being worked through, the design will be finalized.

Table 7.7.1 Conceptual Project Schedule

Description	Estimated Duration
Selection of professional consultants	30-60 days
Scheduling and completion of the Permit Pre-Application Conference	30 days
SEQRA Process	60 days (concurrent with design)
Design	210 Days
Permits and Approvals	60-90 days
Advertisement and Award of Construction Contracts	90 to 120 days
Construction	270 days

8. SUMMARY AND COMPARISON OF RESILIENCY, NATURAL, & NATURE BASED ALTERNATIVES

Alternative A (Take No Action), is not considered viable as it does not mitigate or remedy the recurring issue of high water levels within Lake Ontario, and the consequential severe flooding and damage to infrastructure along the shoreline. The existing properties within the St. Paul Terminus and NYS-DEC Fishing Access areas would continue to flood when the water level within the lake rises above an elevation of 249 feet, potentially becoming permanently inaccessible and inoperative.

The following table summarizes the five feasible alternatives discussed in this report and identifies major differences, pros and cons, non-monetary factors, and costs.

Table 8.1 Summary of Feasible Alternatives

Alternative	Description	Advantages (Pros)	Disadvantages (Cons)
B.1	Public Storm Sewer System Modifications	▪ Remedies flooding to existing on-site sewer systems, public and private property ▪ Lower capital cost	▪ Higher capital cost ▪ Higher O&M cost ▪ Non-green infrastructure
B.2	Private Storm Sewer System Modifications	▪ Remedies flooding to private property ▪ Removes water contribution to public sewer systems	▪ Higher capital cost ▪ Higher O&M cost ▪ Requires property easements
C	Fortification by Floodwall Extension	▪ Remedies flooding to surrounding property and assets ▪ Lower O&M cost	▪ Non-green infrastructure ▪ Requires property easements
D	Fortification by Berm Structure	▪ Remedies flooding to surrounding property and assets ▪ Green infrastructure, nature-based solution ▪ Lower O&M cost	Encumbers parking spaces Limits use of fishing access during flood conditions
E	Upgrade Summerville Wastewater Pump Station	▪ Remedies sanitary sewer capacity issues due to flooding ▪ Protects human health	▪ ▪ Increased O&M cost

9. RECOMMENDATIONS

After careful analysis and review of the proposed alternatives, Popli Design Group has concluded that implementation of multiple alternatives should be considered as part of this project. Therefore, the list of alternatives has been prioritized, where the alternative of highest priority shall provide the most basic asset / nature-based protection and incorporation of green infrastructure within the St. Paul Terminus project area. Subsequent alternatives will serve to further increase the resiliency and sustainability of the area during flood events. The proposed alternatives, from highest to lowest priority are listed as follows:

» Alternative D – Fortification by Berm Structure

» Alternative C – Fortification by Floodwall Extension

» Alternative B.1 – Public Storm Sewer System Modifications

» Alternative E – Upgrade Summerville Wastewater Pump Station

Based on this list, the most vital priority is to create an immediate barrier along the Summerville Lakeshore that will keep the rising water levels from breaching land and coming into contact with the adjacent properties. The proposed floodwall and/or berm structure will serve as this barrier to the lake water, which will prevent direct water damage to the existing buildings and foundation structures. Additionally, containing the water within the river channel will ensure that this water will not need to flow over land, which is over 100 feet inland, to be stored by the existing land drainage structures. This relieves the stormwater collection system from requiring extra capacity, while also further inhibiting the river water from damaging a greater percentage of assets by area. The preferred option of the two would be to implement soil berm structures in conjunction with vegetation, as this provides a natural barrier that not only protects the open spaces beyond the shore, but provides area for the flood water to naturally absorb into the soil. However, due to reasons identified within this report, this approach would reduce the size of the parking area and limit access to the fishing area. Based on these factors, we recommend implementing the flood wall solution (Alternative C) to provide protection to the site while maintaining access to the public fishing area.

The next most essential alternative is the modifications to the public storm sewer system. With respect to this decision, it is important to understand that when the stormwater collection system overflows, the standing water permeates into the ground soil in the areas where it is able. Within the ground, the water continues to infiltrate, potentially flowing into deteriorated pipes that exist there. It has been recognized in this report that due to the age of the existing sanitary sewer system that serves St. Paul Terminus, a portion of the sanitary pipe is mostly likely deteriorated. Therefore, if the stormwater system overflows, it will begin to overburden the sanitary system as well.

Following the modifications to the public storm water system, an upgrade of the Summerville Wastewater Pump Station will serve to provide additional sustainability and resiliency in the event of the flood. Not only will it provide additional capacity for future upstream users, it will ensure protection of electrical equipment and pump station operability for future storm uncertainties.

The final alternative for modifications to the private storm systems is included as part of this assessment as an option for private owners to provide further resiliency to protect their assets. However, final execution of these measures shall be determined by each owner respectively, and will not be included as part of this project

Overall, we recommend that the provisions of a flood wall barrier along the river in combination with modifications to the Public storm sewer system are an absolute necessity in the future utilization and protection of the St. Paul Terminus area, and therefore should be implemented through this project.

The following tables summarizes the concept level initial construction cost estimates for each of the recommended alternatives.

Table 9.1: Project Cost Estimate for Recommended Alternatives

Alternative	Description	Construction Costs
St. Paul Terminus (Project MO-03)		
B.1	Public Storm Sewer System Modifications	$435,000
C	Fortification by Floodwall Extension	$220,000
E	Upgrade Summerville Wastewater Pump Station	$75,000
NYS-DEC Fishing Access (Project MO-09)		
C **/ D**	Fortification by Floodwall Extension / Berm Structure	$159,000
	Overall Construction Cost Subtotal	**$889,000**
	General Conditions and Construction Administration	**$508,000**
	Allowances	**$206,000**

Table 9.1: Project Cost Estimate for Recommended Alternatives

Alternative	Description		Construction Costs
	Total Estimated Construction Cost		**$1,603,000**
	Engineering, Legal, and Administrative	**25.0%**	**$224,000**
	Subtotal Project Cost		**$269,000**
	Contingency	30%	**$1,827,000**
	Total Estimated Project Cost		**$2,096,000**

The total estimated project cost for the recommended alternative (options as described above) is $2,096,000 and includes construction costs as well as 30% contingency and 25% of construction for permitting, engineering, legal, and administrative fees. A summary of the project costs by REDI project is included in Appendix A. Another alternative considered but not developed in this report would be the reduction of the overall inflow to the Summerville Pump Station and storm water collection system through implementation of green infrastructure in the areas upstream from the site. Types of green infrastructure to be considered include, but are not limited to the following:

- Disconnection of downspouts, rooftop drainage pipes, and sumps from draining rainwater into the storm sewer to draining it into rain barrels, cisterns, or surrounding permeable areas.
- Storm and Sanitary Sewer rehabilitation through lining and/or pipe replacement, in order to reduce groundwater from infiltrating existing deteriorated pipes within the collection system.
- Installation of permeable pavements for future rehabilitation projects in the area to infiltrate, treat, and/or store rainwater where it falls.
- Installation of backwater valves on residential sewer lines.

We recommend that a study be pursued by the stakeholders to further develop these options, determine a site boundary, and establish a feasible plan for utility and property owners to further reduce inflow in the future.

- Next steps
  - As part of the planning process, community and stakeholder outreach meetings should be held. Examples of such planned engagement meetings include 1.) forming a Project Advisory Committee to include all public/private owners of the area, public safety agencies, and others that have interest in the future of St. Paul Terminus; 2) Stakeholder meetings to define key issues and opportunities associated with management of the area; 3) Public information meetings to introduce the project to the community and solicit information, ideas, and comments regarding the future management of St. Paul Terminus.
  - Engagement of the City of Rochester Flood Plain Manager and completion of a floodway evaluation for the project area and the west side of the Genesee River (REDI projects MO-07 and MO-10).
  - As part of the permitting and consultation process, additional surveys may be required including: field data verification for sewer systems, high water elevations, and existing infrastructure.
  - Final design with construction-level plan sets need to be developed for the final recommended design.
  - Construction and implementation of the final design.

10. CITATIONS

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Appendix A

Supporting Cost Estimate Information

Buffalo Office
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ESTIMATE SUMMARY - ALTERNATE B.1 / CSI DIVISION

NYS REDI Program		Designer:	PDG	Project No.:	SC19115
St. Paul Terminus		Estimator:	PDG	Date:	3/13/2020
St Paul Terminus and Club Terrace		Trade:	**Site Work**	Client Agency:	NYS - OGS
Rochester, New York		Phase:	Budget	Client Contact:	

		CURRENT Budget 3/13/2020	PREVIOUS Phase Date	Phase Date	Phase Date	Phase Date
CONSTRUCTION						
DIV 01	GENERAL REQUIREMENTS	$229,987				
DIV 02	EXISTING CONDITIONS	$11,274				
DIV 03	CONCRETE					
DIV 04	MASONRY					
DIV 05	METALS					
DIV 06	WOOD, PLASTICS, AND COMPOSITES					
DIV 07	THERMAL AND MOISTURE PROTECTION					
DIV 08	OPENINGS					
DIV 09	FINISHES					
DIV 10	SPECIALTIES					
DIV 11	EQUIPMENT					
DIV 12	FURNISHINGS					
DIV 13	SPECIAL CONSTRUCTION					
DIV 14	CONVEYING EQUIPMENT					
DIV 31	EARTHWORK	$36,841				
DIV 32	EXTERIOR IMPROVEMENTS	$31,194				
DIV 33	UTILITIES	$356,140				
DIV 35	WATERWAY & MARINE CONSTRUCTION					
SUBTOTAL		$665,435	$ -	$ -	$ -	$ -
Allowances		$175,500				
Markups (hazard/occupied, small project, etc.)		$0				
Escalation to Bid Date		$0				
Design and Construction Contingency		$239,496				
TOTAL AMOUNT		$ 1,080,431	$ -	$ -	$ -	$ -

NOTES:

CURRENT ESTIMATE SUMMARY

BID PACKAGE	ESTIMATED BID AMOUNT	FIELD ORDER ALLOWANCE
Construction	$ 1,080,431	
Electric		
HVAC		
Plumbing		
Other		
BID AMOUNT	$ 1,080,431	

ESTIMATE RANGE	**LOW:**	$ 810,323
	HIGH:	$ 1,512,604

POPLI DESIGN GROUP

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ESTIMATE DETAIL - ALTERNATE B.1

NYS REDI Program	Designer:	PDG	Project No.: SC19115
St. Paul Terminus	Estimator:	PDG	Date: 3/13/2020
St Paul Terminus and Club Terrace	Trade:	**Site Work**	Client Agency: NYS - OGS
Rochester, New York	Phase:	Budget	Client Contact:

DIV 01	GENERAL CONDITIONS & ADMINISTRATION					
	Bonds	2%				$13,499
	Supervision	110	days	$550	Day	$60,500
	Permits	1%				$6,749
	Insurance	3.0%				$20,248
	Home Office Overhead	4.5%				$30,373
	Profit	8.5%				$57,370
	Equipment, Tools, Field Office	5	month	$1,000	Month	$5,000
	Mobilization/Demobilization	5%				$33,747
	Survey					$2,500
	ALLOWANCES					
	Utility Relocation Allowance	6.0%				$40,500
	Field Orders	10.0%				$67,500
	Special Inspections and Testing	10.0%				$67,500

CSI Number	ITEM/DESCRIPTION	QUANT	UNIT	MATERIAL UNIT PRICE	MATERIAL TOTAL COST	LABOR MAN HRS / UNIT	LABOR UNIT COST OR WAGE	LABOR TOTAL COST	TOTAL UNIT COST	M&L TOTAL COST
DIV 02	EXISTING CONDITIONS									
	Erosion and sediment controls	1.0	LS	1000.00	1,000	2000.00		2,000	3000.00	$3,000
	Sawcut and remove asphalt	1900.0	SF	0.50	950	1.00		1,900	1.50	$2,850
	Remove and reset granite curb	92.0	LF	0.00	0	8.00		736	8.00	$736
	Remove 18" CMP	30.0	LF	0.00	0	19.59		588	19.59	$588
	Remove Plugged 42" RCP	65.0	LF	0.00	0	40.00		2,600	40.00	$2,600
	Workzone traffic control	1.0	LS	500.00	500	1000.00		1,000	1500.00	$1,500
DIV 31	EARTHWORK									
	Strip and stockpile topsoil, 4"	61.1	CY	5.70	348	1.50		92	7.20	$440
	Excavate to subgrade, load, haul and dispose									
	- Pavement repair at trench	351.9	CY	0.00	0	25.00		8,796	25.00	$8,796
	- Catch basins	18.5	CY	0.00	0	25.00		463	25.00	$463
	- Storm sewer pump station	240.0	CY	0.00	0	25.00		6,000	25.00	$6,000
	- Storm piping	458.3	CY	0.00	0	25.00		11,458	25.00	$11,458
	Subbase material, haul & stockpile on site, place and compact									
	- Medium duty asphalt, 11"	102.1	CY	25.00	2,552	15.00		1,531	40.00	$4,083
	- Catch basins	2.7	CY	25.00	67	15.00		40	40.00	$107
	- Storm sewer pump station	64.0	CY	25.00	1,600	15.00		960	40.00	$2,560
	- Storm piping	73.3	CY	25.00	1,833	15.00		1,100	40.00	$2,933
DIV 32	EXTERIOR IMPROVEMENTS									
	Pavement repair at trench	1900.0	SF	9.00	17,100	4.00		7,600	13.00	$24,700
	Mill and pave existing road, up to 1" deep	525.0	SY	0.00	0	4.75		2,494	4.75	$2,494

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ESTIMATE DETAIL - ALTERNATE B.1

NYS REDI Program	Designer:	PDG	Project No.: SC19115
St. Paul Terminus	Estimator:	PDG	Date: 3/13/2020
St Paul Terminus and Club Terrace	Trade:	**Site Work**	Client Agency: NYS - OGS
Rochester, New York	Phase:	Budget	Client Contact:

	Place topsoil from stockpile, hydroseed, mulch, and fertilizer	5000.0	SF	0.55	2,750	0.25	1,250	0.80	$4,000
DIV 33	Utilities								
	Catch basins, frames and grates								
	Light Traffic 30" x 30"	2.0	EA	403.65	807	209.81	420	613.46	$1,227
	Core drill existing structure, water tight seal	8.0	EA	250.00	2,000	200.00	1,600	450.00	$3,600
	Storm Sewer Piping								
	4" dia. (steel discharge pipe)	250.0	LF	25.00	6,250	23.00	5,750	48.00	$12,000
	12" dia. (Corrugated HDPE)	185.0	LF	8.07	1,493	2.22	411	10.29	$1,904
	18" dia. (Corrugated HDPE)	60.0	LF	14.57	874	3.93	236	18.50	$1,110
	Pump Station Package								
	Storm sewer, 500,000 GPD	1.0	EA	295425.00	295,425	40874.10	40,874	336299.10	$336,299
	Subtotal				335,550		99,898		435,448
	Hazard / Occupied Facility (labor only)		0%				0		$0
	Small Project		0%		0		0		$0
	Escalation to Bid Date		0%		0		0		$0
	Design Contingency		25%		83,887		24,975		$108,862
	Construction Contingency		30%		100,665		29,969		$130,634

Summary	General Conditions	$229,987	21.3%	
	Allowances	$175,500	16.2%	
	Material Cost	$520,102	48.1%	
	Labor Cost	$154,842	14.3%	
	Total Cost	$1,080,431	100%	***say:*** **$1,080,000**

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ESTIMATE SUMMARY - ALTERNATE B.2 / CSI DIVISION

NYS REDI Program		Designer:	PDG	Project No.:	SC19115
St. Paul Terminus		Estimator:	PDG	Date:	3/13/2020
St Paul Terminus and Club Terrace		Trade:	**Site Work**	Client Agency:	NYS - OGS
Rochester, New York		Phase:	Budget	Client Contact:	

		CURRENT Budget 3/13/2020	PREVIOUS Phase Date	Phase Date	Phase Date	Phase Date
CONSTRUCTION						
DIV 01	GENERAL REQUIREMENTS	$42,904				
DIV 02	EXISTING CONDITIONS	$3,000				
DIV 03	CONCRETE					
DIV 04	MASONRY					
DIV 05	METALS					
DIV 06	WOOD, PLASTICS, AND COMPOSITES					
DIV 07	THERMAL AND MOISTURE PROTECTION					
DIV 08	OPENINGS					
DIV 09	FINISHES					
DIV 10	SPECIALTIES					
DIV 11	EQUIPMENT					
DIV 12	FURNISHINGS					
DIV 13	SPECIAL CONSTRUCTION					
DIV 14	CONVEYING EQUIPMENT					
DIV 31	EARTHWORK	$13,609				
DIV 32	EXTERIOR IMPROVEMENTS	$15,020				
DIV 33	UTILITIES	$23,100				
DIV 35	WATERWAY & MARINE CONSTRUCTION					
SUBTOTAL		$97,633	$ -	$ -	$ -	$ -
Allowances		$0				
Markups (hazard/occupied, small project, etc.)		$0				
Escalation to Bid Date		$0				
Design and Construction Contingency		$30,101				
TOTAL AMOUNT		$ 127,734	$ -	$ -	$ -	$ -

NOTES:

CURRENT ESTIMATE SUMMARY

BID PACKAGE	ESTIMATED BID AMOUNT	FIELD ORDER ALLOWANCE
Construction	$ 127,734	
Electric		
HVAC		
Plumbing		
Other		
BID AMOUNT	$ 127,734	

ESTIMATE RANGE	**LOW:**	$ 95,801
	HIGH:	$ 178,828

POPLI DESIGN GROUP

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ESTIMATE DETAIL - ALTERNATE B.2

NYS REDI Program	Designer: PDG	Project No.:	SC19115
St. Paul Terminus	Estimator: PDG	Date:	3/13/2020
St Paul Terminus and Club Terrace	Trade: **Site Work**	Client Agency:	NYS - OGS
Rochester, New York	Phase: Budget	Client Contact:	

DIV 01	GENERAL CONDITIONS & ADMINISTRATION					
	Bonds	2%				$1,697
	Supervision	30	days	$550	Day	$16,500
	Permits	1%				$848
	Insurance	3.0%				$2,545
	Home Office Overhead	6.0%				$5,090
	Profit	10.0%				$8,483
	Equipment, Tools, Field Office	1	month	$1,000	Month	$1,000
	Mobilization/Demobilization	5%				$4,242
	Survey					$2,500
	ALLOWANCES					
	Utility Relocation Allowance	0.0%				$0
	Field Orders	0.0%				$0
	Special Inspections and Testing	0.0%				$0

CSI Number	ITEM/DESCRIPTION	QUANT	UNIT	MATERIAL UNIT PRICE	MATERIAL TOTAL COST	LABOR MAN HRS / UNIT	LABOR UNIT COST OR WAGE	LABOR TOTAL COST	TOTAL UNIT COST	M&L TOTAL COST
DIV 02	EXISTING CONDITIONS									
	Erosion and sediment controls	1.0	LS	1000.00	1,000		2000.00	2,000	3000.00	$3,000
DIV 31	EARTHWORK									
	Strip and stockpile topsoil, 4"	36.7	CY	5.70	209		1.50	55	7.20	$264
	Excavate to subgrade, load, haul and dispose									
	- Pavement repair at trench	74.1	CY	0.00	0		25.00	1,852	25.00	$1,852
	- Storm sewer pump station	250.0	CY	0.00	0		25.00	6,250	25.00	$6,250
	- Storm piping	111.1	CY	0.00	0		25.00	2,778	25.00	$2,778
	Subbase material, haul & stockpile on site, place and compact									
	- Storm sewer pump station	32.0	CY	25.00	800		15.00	480	40.00	$1,280
	- Storm piping	29.6	CY	25.00	741		15.00	444	40.00	$1,185
DIV 32	EXTERIOR IMPROVEMENTS									
	Pavement repair at trench	500.0	SF	9.00	4,500		4.00	2,000	13.00	$6,500
	Place topsoil from stockpile, hydroseed, mulch, and fertilizer	3000.0	SF	0.55	1,650		0.25	750	0.80	$2,400
	6 inch dia. bollard, concrete filled schedule 40 steel pipe	8.0	EA	681.36	5,451		83.69	670	765.05	$6,120
DIV 33	Utilities									
	Storm Sewer Piping									
	2" dia. (sch 40 steel discharge pipe)	200.0	LF	12.00	2,400		13.00	2,600	25.00	$5,000
	Check Valves, Tide Flex									
	12" diameter	2.0	EA	3000.00	6,000		1000.00	2,000	4000.00	$8,000
	Pump Station Package									
	Storm sewer, 100,000 GPD	2.0	EA	3850.00	7,700		1200.00	2,400	5050.00	$10,100

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ESTIMATE DETAIL - ALTERNATE B.2

NYS REDI Program	Designer:	PDG	Project No.:	SC19115
St. Paul Terminus	Estimator:	PDG	Date:	3/13/2020
St Paul Terminus and Club Terrace	Trade:	**Site Work**	Client Agency:	NYS - OGS
Rochester, New York	Phase:	Budget	Client Contact:	

Subtotal		30,451	24,279	54,729
Hazard / Occupied Facility (labor only)	0%		0	$0
Small Project	0%	0	0	$0
Escalation to Bid Date	0%	0	0	$0
Design Contingency	25%	7,613	6,070	$13,682
Construction Contingency	30%	9,135	7,284	$16,419

Summary	General Conditions	$42,904	33.6%		
	Allowances	$0			
	Material Cost	$47,198	37.0%		
	Labor Cost	$37,632	29.5%		
	Total Cost	$127,734	100%	***say:***	**$128,000**

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ESTIMATE SUMMARY - ALTERNATE C / CSI DIVISION

NYS REDI Program		Designer:	PDG	Project No.:	SC19115
St. Paul Terminus		Estimator:	PDG	Date:	3/13/2020
St Paul Terminus and Club Terrace		Trade:	**Site Work**	Client Agency:	NYS - OGS
Rochester, New York		Phase:	Budget	Client Contact:	

		CURRENT Budget 3/13/2020	PREVIOUS Phase Date	Phase Date	Phase Date	Phase Date
CONSTRUCTION						
DIV 01	GENERAL REQUIREMENTS	$203,451				
DIV 02	EXISTING CONDITIONS	$31,198				
DIV 03	CONCRETE	$155,404				
DIV 04	MASONRY					
DIV 05	METALS					
DIV 06	WOOD, PLASTICS, AND COMPOSITES					
DIV 07	THERMAL AND MOISTURE PROTECTION					
DIV 08	OPENINGS					
DIV 09	FINISHES					
DIV 10	SPECIALTIES					
DIV 11	EQUIPMENT					
DIV 12	FURNISHINGS					
DIV 13	SPECIAL CONSTRUCTION					
DIV 14	CONVEYING EQUIPMENT					
DIV 31	EARTHWORK	$76,000				
DIV 32	EXTERIOR IMPROVEMENTS	$59,000				
DIV 33	UTILITIES					
DIV 35	WATERWAY & MARINE CONSTRUCTION	$56,880				
SUBTOTAL		$581,933	$ -	$ -	$ -	$ -
Allowances		$29,300				
Markups (hazard/occupied, small project, etc.)		$0				
Escalation to Bid Date		$0				
Design and Construction Contingency		$208,165				
TOTAL AMOUNT		$ 819,398	$ -	$ -	$ -	$ -

NOTES:

CURRENT ESTIMATE SUMMARY

BID PACKAGE	ESTIMATED BID AMOUNT	FIELD ORDER ALLOWANCE
Construction	$ 819,398	
Electric		
HVAC		
Plumbing		
Other		
BID AMOUNT	$ 819,398	

ESTIMATE RANGE	**LOW:**	$ 614,548
	HIGH:	$ 1,147,157

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ESTIMATE DETAIL - ALTERNATE C

NYS REDI Program	Designer: PDG	Project No.:	SC19115
St. Paul Terminus	Estimator: PDG	Date:	3/13/2020
St Paul Terminus and Club Terrace	Trade: **Site Work**	Client Agency:	NYS - OGS
Rochester, New York	Phase: Budget	Client Contact:	

DIV 01	GENERAL CONDITIONS & ADMINISTRATION						
	Bonds	2%					$11,733
	Supervision	120	days		$550	Day	$66,000
	Permits	1%					$5,866
	Insurance	3.0%					$5,756
	Home Office Overhead	4.5%					$26,399
	Profit	8.5%					$49,865
	Equipment, Tools, Field Office	6	month		$1,000	Month	$6,000
	Mobilization/Demobilization	5%					$29,332
	Survey						$2,500
	ALLOWANCES						
	Utility Relocation Allowance						$0
	Field Orders						$0
	Special Inspections and Testing	5.0%					$29,300

CSI Number	ITEM/DESCRIPTION	QUANT	UNIT	MATERIAL UNIT PRICE	MATERIAL TOTAL COST	LABOR MAN HRS / UNIT	LABOR UNIT COST OR WAGE	LABOR TOTAL COST	TOTAL UNIT COST	TOTAL M&L TOTAL COST
DIV 02	EXISTING CONDITIONS									
	Erosion and sediment controls	2.0	LS	1000.00	2,000	2000.00		4,000	3000.00	$6,000
	Remove handrail	50.0	LF	0.00	0	15.00		750	15.00	$750
	Remove chain link fence	130.0	LF	0.00	0	15.00		1,950	15.00	$1,950
	Remove 12" concrete seawall at NYS-DEC haul and dispose	65	LF	1.5	98	160		10,400	161.50	$10,498
	Remove Bollards / General Demo NYS-DEC haul and dispose	1	LS	200	200	11800		11,800	12000.00	$12,000
DIV 03	CONCRETE									
	Concrete seawall (USCG), 12" thick, incl.									
	reinforcement, finish and curing	125.0	LF	69.05	8,631	69.30		8,663	138.35	$17,294
	- Drill and grout reinforcement	125.0	LF	7.66	958	36.25		4,531	43.91	$5,489
	- Waterstop	125.0	LF	13.21	1,651	2.43		304	15.64	$1,955
	Concrete seawall (Sheriff), 12" thick, incl.									
	reinforcement, finish and curing	250.0	LF	69.05	17,263	69.30		17,325	138.35	$34,588
	- Drill and grout reinforcement	250.0	LF	7.66	1,915	36.25		9,063	43.91	$10,978
	- Waterstop	250.0	LF	13.21	3,303	2.43		608	15.64	$3,910
	Concrete seawall (NYS-DEC Fishing Access), 12" thick, incl.									
	reinforcement, finish and curing	385.0	LF	69.05	26,584	69.30		26,681	138.35	$53,265
	- Drill and grout reinforcement	385.0	LF	7.66	2,949	36.25		13,956	43.91	$16,905
	- Waterstop	385.0	LF	13.21	5,086	2.43		936	15.64	$6,021
	ADA Access Ramp at Wall	1	LS	2500	2,500	2500		2,500	5000.00	$5,000

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ESTIMATE DETAIL - ALTERNATE C

NYS REDI Program	Designer:	PDG	Project No.: SC19115
St. Paul Terminus	Estimator:	PDG	Date: 3/13/2020
St Paul Terminus and Club Terrace	Trade:	**Site Work**	Client Agency: NYS - OGS
Rochester, New York	Phase:	Budget	Client Contact:

DIV 31	EARTHWORK							
	Excavate 12" to subgrade for new berm, load, haul and dispose	1.0	LS	0.00	0	15000.00	15,000	15000.00	$15,000
	Earth fill, haul & stockpile on site, place and compact - New berm	1.0	LS	35000.00	35,000	26000.00	26,000	61000.00	$61,000
DIV 32	EXTERIOR IMPROVEMENTS							
	Place topsoil from stockpile, hydroseed, mulch, and fertilizer - New berm	1.0	LS	10000.00	10,000	9000.00	9,000	19000.00	$19,000
	Surface Restoration (Pavement / Turf)	1.0	LS	28000.00	28,000	12000.00	12,000	40000.00	$40,000
DIV 35	Waterway and Marine Construction							
	Hydraulic gates, stop logs, 6' x 4'							
	- SOL	1.0	EA	3000.00	3,000	1000.00	1,000	4000.00	$4,000
	- USCG	2.0	EA	3000.00	6,000	1000.00	2,000	4000.00	$8,000
	- Sheriff	3.0	EA	3000.00	9,000	1000.00	3,000	4000.00	$12,000
	- NYS-DEC Fishing Access	3.0	EA	3000.00	9,000	1000.00	3,000	4000.00	$12,000
	Aluminum Stairway -Serrated Treads, Handrail	48.0	Riser	390.00	18,720	45.00	2,160	435.00	$20,880
	Subtotal				191,857		186,625		378,482
	Hazard / Occupied Facility (labor only)	0%					0		$0
	Small Project	0%			0		0		$0
	Escalation to Bid Date	0%			0		0		$0
	Design Contingency	25%			47,964		46,656		$94,620
	Construction Contingency	30%			57,557		55,987		$113,544

Summary	General Conditions	$203,451	24.8%	
	Allowances	$29,300	3.6%	
	Material Cost	$297,378	36.3%	
	Labor Cost	$289,268	35.3%	
	Total Cost	$819,398	100%	***say:*** **$819,000**

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ESTIMATE SUMMARY - ALTERNATE D / CSI DIVISION

NYS REDI Program		Designer:	PDG	Project No.:	SC19115
St. Paul Terminus		Estimator:	PDG	Date:	3/13/2020
St Paul Terminus and Club Terrace		Trade:	**Site Work**	Client Agency:	NYS - OGS
Rochester, New York		Phase:	Budget	Client Contact:	

		CURRENT Budget 3/13/2020	PREVIOUS Phase Date	Phase Date	Phase Date	Phase Date
CONSTRUCTION						
DIV 01	GENERAL REQUIREMENTS	$81,961				
DIV 02	EXISTING CONDITIONS	$7,668				
DIV 03	CONCRETE					
DIV 04	MASONRY					
DIV 05	METALS					
DIV 06	WOOD, PLASTICS, AND COMPOSITES					
DIV 07	THERMAL AND MOISTURE PROTECTION					
DIV 08	OPENINGS					
DIV 09	FINISHES					
DIV 10	SPECIALTIES					
DIV 11	EQUIPMENT					
DIV 12	FURNISHINGS					
DIV 13	SPECIAL CONSTRUCTION					
DIV 14	CONVEYING EQUIPMENT					
DIV 31	EARTHWORK	$30,271				
DIV 32	EXTERIOR IMPROVEMENTS	$5,920				
DIV 33	UTILITIES					
DIV 35	WATERWAY & MARINE CONSTRUCTION	$55,500				
SUBTOTAL		$181,320	$ -	$ -	$ -	$ -
Allowances		$0				
Markups (hazard/occupied, small project, etc.)		$0				
Escalation to Bid Date		$0				
Design and Construction Contingency		$54,647				
TOTAL AMOUNT		$ 235,967	$ -	$ -	$ -	$ -

NOTES:

CURRENT ESTIMATE SUMMARY

BID PACKAGE	ESTIMATED BID AMOUNT	FIELD ORDER ALLOWANCE
Construction	$ 235,967	
Electric		
HVAC		
Plumbing		
Other		
BID AMOUNT	$ 235,967	

ESTIMATE RANGE	**LOW:**	$ 176,976
	HIGH:	$ 330,354

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ESTIMATE DETAIL - ALTERNATE D

NYS REDI Program	Designer:	PDG	Project No.: SC19115
St. Paul Terminus	Estimator:	PDG	Date: 3/13/2020
St Paul Terminus and Club Terrace	Trade:	**Site Work**	Client Agency: NYS - OGS
Rochester, New York	Phase:	Budget	Client Contact:

DIV 01	GENERAL CONDITIONS & ADMINISTRATION					
	Bonds	2%				$3,080
	Supervision	70	days	$550	Day	$38,500
	Permits	1%				$1,540
	Insurance	3.0%				$4,620
	Home Office Overhead	4.5%				$6,930
	Profit	8.5%				$13,091
	Equipment, Tools, Field Office	4	month	$1,000	Month	$4,000
	Mobilization/Demobilization	5%				$7,700
	Survey					$2,500
	ALLOWANCES					
	Utility Relocation Allowance	0.0%				$0
	Field Orders	0.0%				$0
	Special Inspections and Testing	0.0%				$0

CSI Number	ITEM/DESCRIPTION	QUANT	UNIT	MATERIAL UNIT PRICE	MATERIAL TOTAL COST	LABOR MAN HRS / UNIT	LABOR UNIT COST OR WAGE	LABOR TOTAL COST	TOTAL UNIT COST	M&L TOTAL COST
DIV 02	EXISTING CONDITIONS									
	Erosion and sediment controls	1.0	LS	1000.00	1,000	2000.00		2,000	3000.00	$3,000
	Sawcut and remove asphalt	2000.0	SF	0.50	1,000	1.00		2,000	1.50	$3,000
	Remove chain link fence	60.0	LF	0.00	0	2.80		168	2.80	$168
	Workzone traffic control	1.0	LS	500.00	500	1000.00		1,000	1500.00	$1,500
DIV 31	EARTHWORK									
	Strip and stockpile topsoil, 4" - Existing berms (2)	30.0	CY	5.70	171	1.50		45	7.20	$216
	Excavate 12" to subgrade for new berm, load, haul and dispose	220.0	CY	0.00	0	25.00		5,500	25.00	$5,500

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ESTIMATE DETAIL - ALTERNATE D

NYS REDI Program	Designer:	PDG	Project No.: SC19115
St. Paul Terminus	Estimator:	PDG	Date: 3/13/2020
St Paul Terminus and Club Terrace	Trade:	**Site Work**	Client Agency: NYS - OGS
Rochester, New York	Phase:	Budget	Client Contact:

	Earth fill, haul & stockpile on site, place and compact							
	- Existing berms (2)	120.0	CY	20.00	2,400	15.00	1,800	35.00	$4,200
	- New berm	400.0	CY	20.00	8,000	15.00	6,000	35.00	$14,000
	Riprap for slope protection, machine placed at new berm	110.0	CY	26.52	2,917	31.25	3,438	57.77	$6,355
DIV 32	EXTERIOR IMPROVEMENTS							
	Place topsoil from stockpile, hydroseed, mulch, and fertilizer							
	- Existing berms (2)	4850.0	SF	0.55	2,668	0.25	1,213	0.80	$3,880
	- New berm	2550.0	SF	0.55	1,403	0.25	638	0.80	$2,040
DIV 35	WATERWAY AND MARINE CONSTRUCTION							
	Hydraulic gates, stop logs, 6' x 3'	3.0	EA	15000.00	45,000	3500.00	10,500	18500.00	$55,500
	Subtotal				65,058		34,301		99,359
	Hazard / Occupied Facility (labor only)	0%					0		$0
	Small Project	0%			0		0		$0
	Escalation to Bid Date	0%			0		0		$0
	Design Contingency	25%			16,265		8,575		$24,840
	Construction Contingency	30%			19,517		10,290		$29,808

Summary	General Conditions	$81,961	34.7%	
	Allowances	$0		
	Material Cost	$100,840	42.7%	
	Labor Cost	$53,166	22.5%	
	Total Cost	$235,967	100%	***say:*** **$236,000**

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ESTIMATE SUMMARY - ALTERNATE E / CSI DIVISION

NYS REDI Program		Designer:	PDG	Project No.:	SC19115
St. Paul Terminus		Estimator:	PDG	Date:	3/13/2020
St Paul Terminus and Club Terrace		Trade:	**Site Work**	Client Agency:	NYS - OGS
Rochester, New York		Phase:	Budget	Client Contact:	

		CURRENT Budget 3/13/2020	PREVIOUS Phase Date	Phase Date	Phase Date	Phase Date
CONSTRUCTION						
DIV 01	GENERAL REQUIREMENTS	$70,984				
DIV 02	EXISTING CONDITIONS					
DIV 03	CONCRETE					
DIV 04	MASONRY					
DIV 05	METALS					
DIV 06	WOOD, PLASTICS, AND COMPOSITES					
DIV 07	THERMAL AND MOISTURE PROTECTION					
DIV 08	OPENINGS					
DIV 09	FINISHES					
DIV 10	SPECIALTIES					
DIV 11	EQUIPMENT					
DIV 12	FURNISHINGS					
DIV 13	SPECIAL CONSTRUCTION					
DIV 14	CONVEYING EQUIPMENT					
DIV 22	ELECTRICAL	$29,000				
DIV 31	EARTHWORK					
DIV 32	EXTERIOR IMPROVEMENTS					
DIV 33	UTILITIES	$53,400				
SUBTOTAL		$153,384	$ -	$ -	$ -	$ -
Allowances		$45,900				
Markups (hazard/occupied, small project, etc.)		$0				
Escalation to Bid Date		$0				
Design and Construction Contingency		$45,320				
TOTAL AMOUNT		$ 244,604	$ -	$ -	$ -	$ -

NOTES:

CURRENT ESTIMATE SUMMARY

BID PACKAGE	ESTIMATED BID AMOUNT	FIELD ORDER ALLOWANCE
Construction	$ 244,604	
Electric		
HVAC		
Plumbing		
Other		
BID AMOUNT	$ 244,604	

ESTIMATE RANGE	**LOW:**	$ 183,453
	HIGH:	$ 342,446

Buffalo Office
374 Delaware Avenue, Suite 306
Buffalo, New York 14202
Phone: (716) 625 - 9200

ESTIMATE DETAIL - ALTERNATE E

NYS REDI Program	Designer: PDG	Project No.:	SC19115
St. Paul Terminus	Estimator: PDG	Date:	3/13/2020
St Paul Terminus and Club Terrace	Trade: **Site Work**	Client Agency:	NYS - OGS
Rochester, New York	Phase: Budget	Client Contact:	

DIV 01	GENERAL CONDITIONS & ADMINISTRATION						
	Bonds	2%					$2,554
	Supervision	60	days		$550	Day	$33,000
	Permits	1%					$1,277
	Insurance	3.0%					$3,832
	Home Office Overhead	6.0%					$7,663
	Profit	10.0%					$12,772
	Equipment, Tools, Field Office	1	month		$1,000	Month	$1,000
	Mobilization/Demobilization	5%					$6,386
	Survey						$2,500
	ALLOWANCES						
	Utility Relocation Allowance	12.0%					$15,300
	Field Orders	12.0%					$15,300
	Special Inspections and Testing	12.0%					$15,300

CSI Number	ITEM/DESCRIPTION	QUANT	UNIT	MATERIAL UNIT PRICE	MATERIAL TOTAL COST	LABOR MAN HRS / UNIT	LABOR UNIT COST OR WAGE	LABOR TOTAL COST	TOTAL UNIT COST	M&L TOTAL COST
DIV 26	ELECTRICAL									
	Remove existing pump controls	1.0	EA	0.00			1000.00	1,000	1000.00	$1,000
	Duplex pump control panel	1.0	EA	3500.00	3,500		500.00	500	4000.00	$4,000
	Variable frequency drives, enclosed, for 30 HP motor size	2.0	EA	10000.00	20,000		2000.00	4,000	12000.00	$24,000
DIV 33	UTILITIES									
	Remove existing sanitary sewer pumps, and piping	1.0	EA	0.00	0		2500.00	2,500	2500.00	$2,500
	Sanitary piping, 4" dia. steel, pump discharge	20.0	LF	22.00	440		23.00	460	45.00	$900
	Sanitary sewer pumps, submersible, 30 HP, 1,000+ gpm	2.0	EA	20000.00	40,000		5000.00	10,000	25000.00	$50,000
	Subtotal				63,940			18,460		82,400
	Hazard / Occupied Facility (labor only)		0%					0		$0
	Small Project		0%		0			0		$0
	Escalation to Bid Date		0%		0			0		$0
	Design Contingency		25%		15,985			4,615		$20,600
	Construction Contingency		30%		19,182			5,538		$24,720

Summary	General Conditions	$70,984	29.0%	
	Allowances	$45,900	18.8%	
	Material Cost	$99,107	40.5%	
	Labor Cost	$28,613	11.7%	
	Total Cost	$244,604	100%	***say:*** **$245,000**

Appendix B

Existing Utility Records

ELECTRIC & GAS SERVICE COORDINATION NOTES:

1. ELECTRIC AND PLUMBING CONTRACTORS SHALL COORDINATE WITH EACH OTHER AND DIRECTLY WITH ROCHESTER GAS & ELECTRIC (RG&E) ELECTRIC AND GAS DEPARTMENTS FOR METER AND SERVICE LOCATIONS PRIOR TO INSTALLATION.
2. ELECTRIC AND PLUMBING CONTRACTORS SHALL ALLOW FOR THE NECESSARY PROVISIONS WHEN INSTALLING METERS AND SERVICES IN ACCORDANCE WITH RG&E DESIGN AND INSTALLATION GUIDELINES.
3. ELECTRIC AND PLUMBING CONTRACTORS SHALL DIRECTLY COORDINATE WITH EACH OTHER AND DIRECTLY WITH RG&E FOR ELECTRIC AND GAS START-UP.

SEWER USE LAW

FLOOR DRAINS, IF CONSTRUCTED, SHALL BE CONNECTED TO THE SANITARY/COMBINATION SEWER. FLOOR DRAINS DO NOT INCLUDE FOUNDATION/FOOTER DRAINS.

NOTE: ALL DISCHARGES TO THE SANITARY/COMBINATION SEWER MUST COMPLY WITH THE EFFLUENT LIMITS OF THE LOCAL AND OR MONROE COUNTY SEWER USE LAW.

HYDRANT FLOW DATA:

LOCATION: St. Paul Boulevard

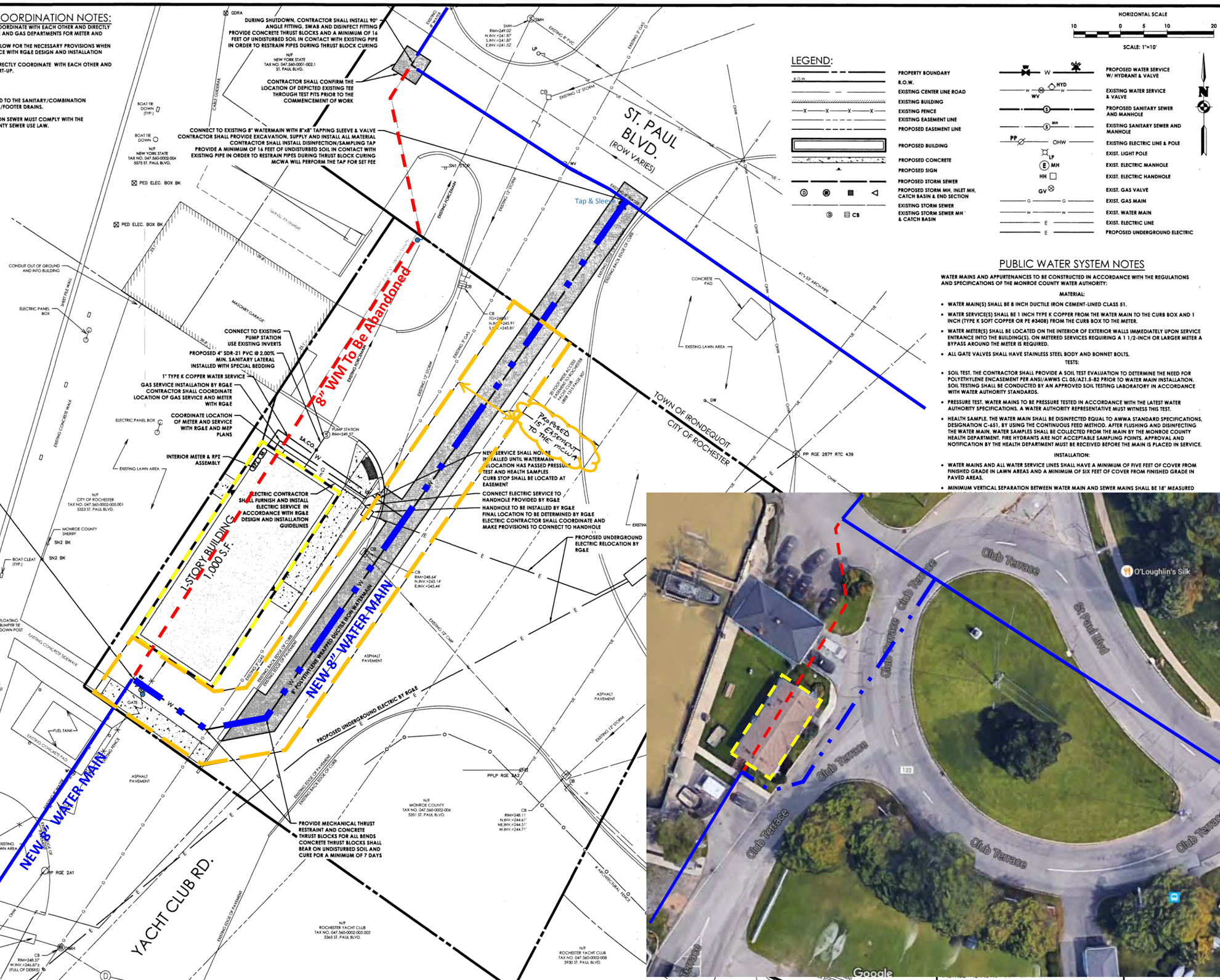
DATE: JUNE 21, 2002

P. STATIC = 133.0 psi

P. RESIDUAL = 100.0 psi

Q OBSERVED = 1,114 gpm

Qapsi = 1,064 gpm



LEGEND:

- PROPERTY BOUNDARY
- R.O.W.
- EXISTING CENTER LINE ROAD
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- PROPOSED BUILDING
- PROPOSED CONCRETE
- PROPOSED SIGN
- PROPOSED STORM SEWER
- PROPOSED STORM MH, INLET MH, CATCH BASIN & END SECTION
- EXISTING STORM SEWER
- EXISTING STORM SEWER MH & CATCH BASIN
- PROPOSED WATER SERVICE W/ HYDRANT & VALVE
- EXISTING WATER SERVICE & VALVE
- PROPOSED SANITARY SEWER AND MANHOLE
- EXISTING SANITARY SEWER AND MANHOLE
- EXISTING ELECTRIC LINE & POLE
- EXIST. LIGHT POLE
- EXIST. ELECTRIC MANHOLE
- EXIST. ELECTRIC HANDHOLE
- EXIST. GAS VALVE
- EXIST. GAS MAIN
- EXIST. WATER MAIN
- EXIST. ELECTRIC LINE
- PROPOSED UNDERGROUND ELECTRIC

PUBLIC WATER SYSTEM NOTES

WATER MAINS AND APPURTENANCES TO BE CONSTRUCTED IN ACCORDANCE WITH THE REGULATIONS AND SPECIFICATIONS OF THE MONROE COUNTY WATER AUTHORITY:

MATERIAL:

- WATER MAIN(S) SHALL BE 8 INCH DUCTILE IRON CEMENT-LINED CLASS 51.
- WATER SERVICE(S) SHALL BE 1 INCH TYPE K COPPER FROM THE WATER MAIN TO THE CURB BOX AND 1 INCH (TYPE K SOFT COPPER OR PE #3408) FROM THE CURB BOX TO THE METER.
- WATER METER(S) SHALL BE LOCATED ON THE INTERIOR OF EXTERIOR WALLS IMMEDIATELY UPON SERVICE ENTRANCE INTO THE BUILDING(S). ON METERED SERVICES REQUIRING A 1 1/2-INCH OR LARGER METER A BYPASS AROUND THE METER IS REQUIRED.
- ALL GATE VALVES SHALL HAVE STAINLESS STEEL BODY AND BONNET BOLTS.

TESTS:

- SOIL TEST. THE CONTRACTOR SHALL PROVIDE A SOIL TEST EVALUATION TO DETERMINE THE NEED FOR POLYETHYLENE ENCASEMENT PER ANSI/AWWS CL 05/AZ1.5-82 PRIOR TO WATER MAIN INSTALLATION. SOIL TESTING SHALL BE CONDUCTED BY AN APPROVED SOIL TESTING LABORATORY IN ACCORDANCE WITH WATER AUTHORITY STANDARDS.
- PRESSURE TEST. WATER MAINS TO BE PRESSURE TESTED IN ACCORDANCE WITH THE LATEST WATER AUTHORITY SPECIFICATIONS. A WATER AUTHORITY REPRESENTATIVE MUST WITNESS THIS TEST.
- HEALTH SAMPLE. THE WATER MAIN SHALL BE DISINFECTED EQUAL TO AWWA STANDARD SPECIFICATIONS, DESIGNATION C-651, BY USING THE CONTINUOUS FEED METHOD. AFTER FLUSHING AND DISINFECTING THE WATER MAIN, WATER SAMPLES SHALL BE COLLECTED FROM THE MAIN BY THE MONROE COUNTY HEALTH DEPARTMENT. FIRE HYDRANTS ARE NOT ACCEPTABLE SAMPLING POINTS. APPROVAL AND NOTIFICATION BY THE HEALTH DEPARTMENT MUST BE RECEIVED BEFORE THE MAIN IS PLACED IN SERVICE.

INSTALLATION:

- WATER MAINS AND ALL WATER SERVICE LINES SHALL HAVE A MINIMUM OF FIVE FEET OF COVER FROM FINISHED GRADE IN LAWN AREAS AND A MINIMUM OF SIX FEET OF COVER FROM FINISHED GRADE IN PAVED AREAS.
- MINIMUM VERTICAL SEPARATION BETWEEN WATER MAIN AND SEWER MAINS SHALL BE 18" MEASURED

PASSERO ASSOCIATES
Engineering • Architecture
www.passero.com

Client:

MONROE COUNTY DES
50 WEST MAIN STREET
SUITE 7100, CITY PLACE
ROCHESTER, NY 14614

PASSERO ASSOCIATES
242 West Main Street Suite 100, Rochester, New York 14614 (585) 325-1000 Fax: (585) 325-1691
Principal-in-Charge John F. Caruso, PE
Project Manager Jess D. Sudol, PE
Designed by Joseph J. Jacobs, PE

STATE OF NEW YORK — JOHN F. CARUSO — 066631 — LICENSED PROFESSIONAL ENGINEER

Revisions

No.	Date	By	Description
1	5/26/16	JJJ	REVISED PER CLIENT
2	6/9/16	JJJ	REVISED PER MCWA
3	6/23/16	JJJ	REVISED PER CLIENT

UTILITY PLAN

SHERIFF'S MARINE UNIT BUILDING
5351 ST. PAUL STREET

Town/City: Rochester
County: Monroe State: New York

Project No. 20141872.0001

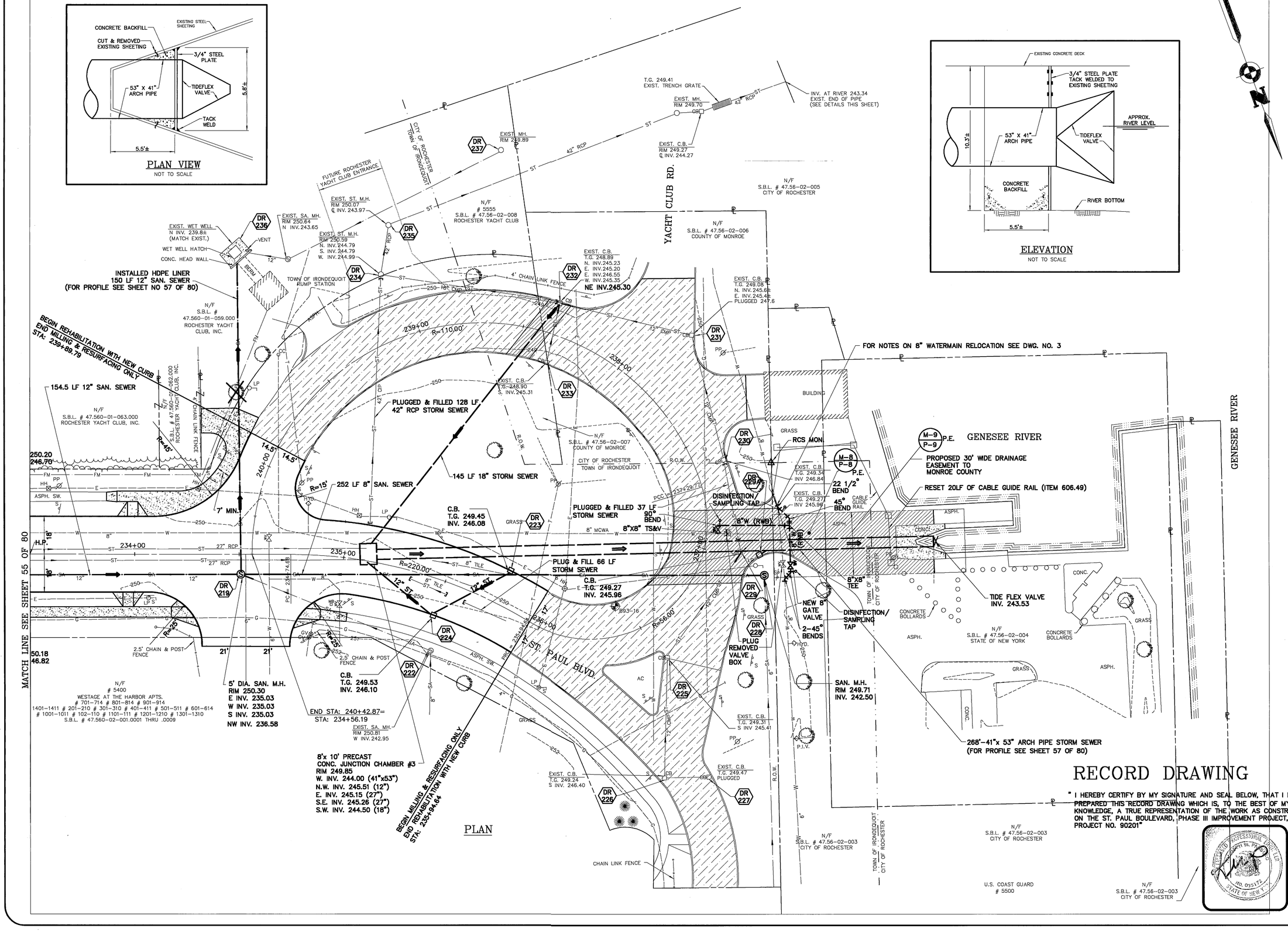
Drawing No. C 102 | Sheet No. 2

Scale: 1" = 10'

Date AUGUST 2015

PLAN VIEW
NOT TO SCALE

ELEVATION
NOT TO SCALE



RECORD DRAWING

" I HEREBY CERTIFY BY MY SIGNATURE AND SEAL BELOW, THAT I HAVE PREPARED THIS RECORD DRAWING WHICH IS, TO THE BEST OF MY KNOWLEDGE, A TRUE REPRESENTATION OF THE WORK AS CONSTRUCTED ON THE ST. PAUL BOULEVARD, PHASE III IMPROVEMENT PROJECT, PROJECT NO. 90201"

LICENSED PROFESSIONAL ENGINEER
NO. 053172
STATE OF NEW YORK

No.	DATE	BY	REVISION
			UNAUTHORIZED ALTERATIONS OR ADDITIONS TO THIS DRAWING IS IN VIOLATION OF STATE EDUCATION LAW ARTICLE 145 SECTION 7209 AND ARTICLE 147 SECTION 7307

PASSERO ASSOCIATES, P.C.
ARCHITECTS-ENGINEERS-SURVEYORS
100 LIBERTY POLE WAY ROCHESTER,N.Y. 14604
716-325-1000

PROJECT: ST. PAUL BOULEVARD-PHASE III
TOWN OF IRONDEQUOIT/MONROE COUNTY, STATE OF NEW YORK

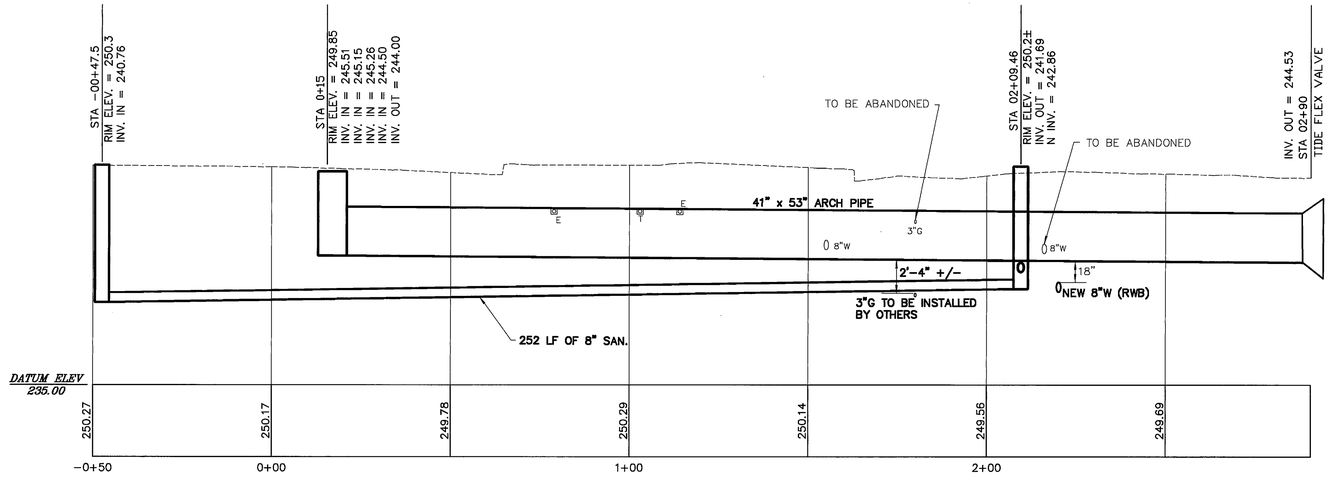
DRAWING: PLAN

CLIENT: MONROE COUNTY DEPARTMENT OF ENGINEERING

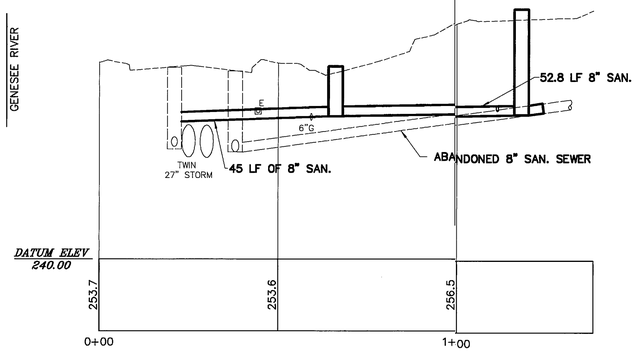
Partner in Charge	K.W.P.
Project Manager	D.J.S.
Drawn by	R.W.B.

PROJECT NO. 95017.01
DRAWING NO. 56 OF 80
SCALE HORTZ. 1"=20' VERT. 1"=5'
DATE OCTOBER 1995

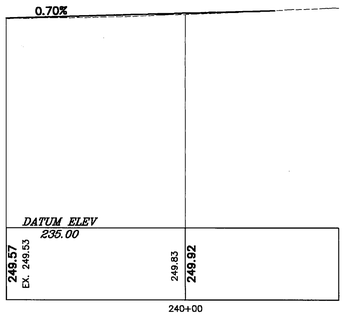
C:\DWGS\PDL\95017010 Mon May 25 09:45:02 1998 MB



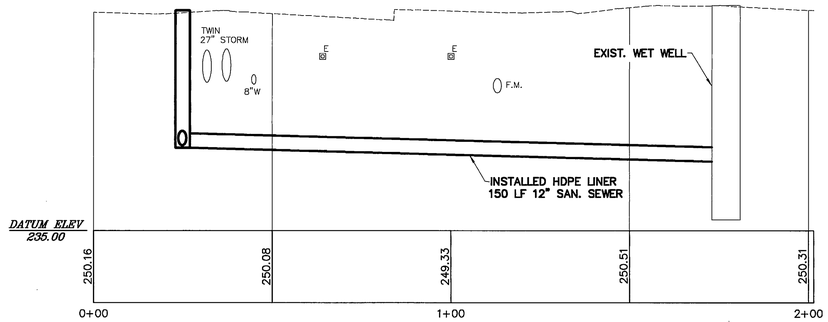
41"x 53" STORM SEWER PROFILE FROM DR 221 TO TIDE FLEX VALVE
& SANITARY SEWER PROFILE FROM DR 219 TO DR 228



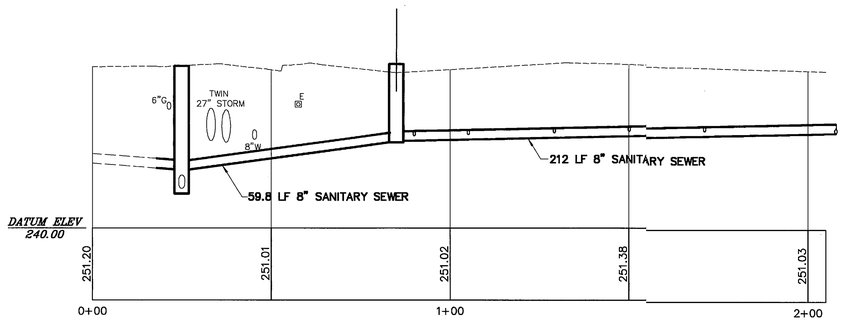
SANITARY SEWER PROFILE FROM DR 170 TO DR 170B



PROFILE



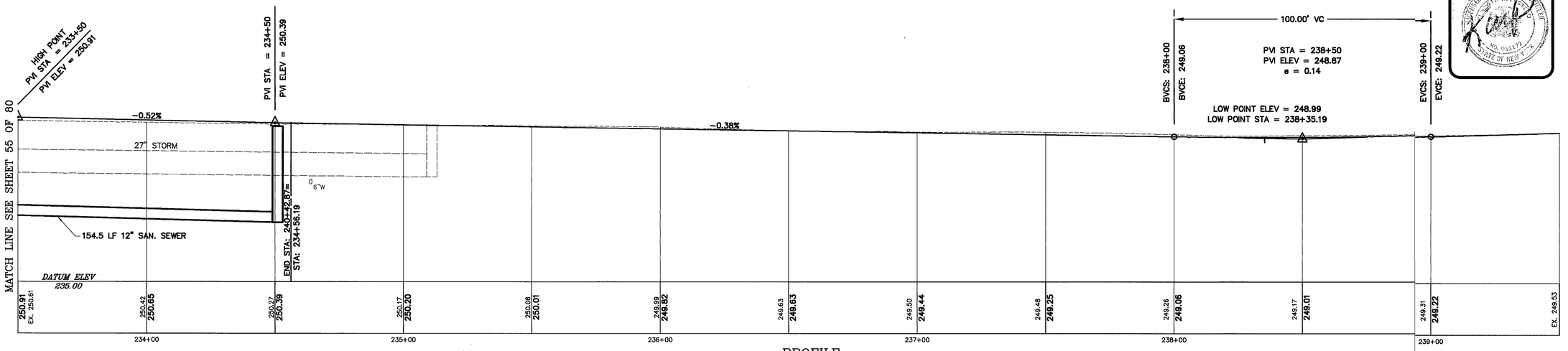
SANITARY SEWER PROFILE FROM DR 219 TO DR 236



SANITARY SEWER PROFILE FROM DR 212 TO DR 212B

RECORD DRAWING

" I HEREBY CERTIFY BY MY SIGNATURE AND SEAL BELOW, THAT I HAVE PREPARED THIS RECORD DRAWING WHICH IS, TO THE BEST OF MY KNOWLEDGE, A TRUE REPRESENTATION OF THE WORK AS CONSTRUCTED ON THE ST. PAUL BOULEVARD, PHASE III IMPROVEMENT PROJECT, PROJECT NO. 90201"



PROFILE

No.	DATE	BY	REVISION
			MANUFACTURED ALTERATIONS OR ADDITIONS TO THIS DRAWING IS IN VIOLATION OF STATE EDUCATION LAW ARTICLE 145 SECTION 7209 AND ARTICLE 147 SECTION 7307

PASSERO ASSOCIATES, P.C.
ARCHITECTS-ENGINEERS-SURVEYORS
100 LIBERTY POLE WAY ROCHESTER,N.Y. 14604
716-325-1000

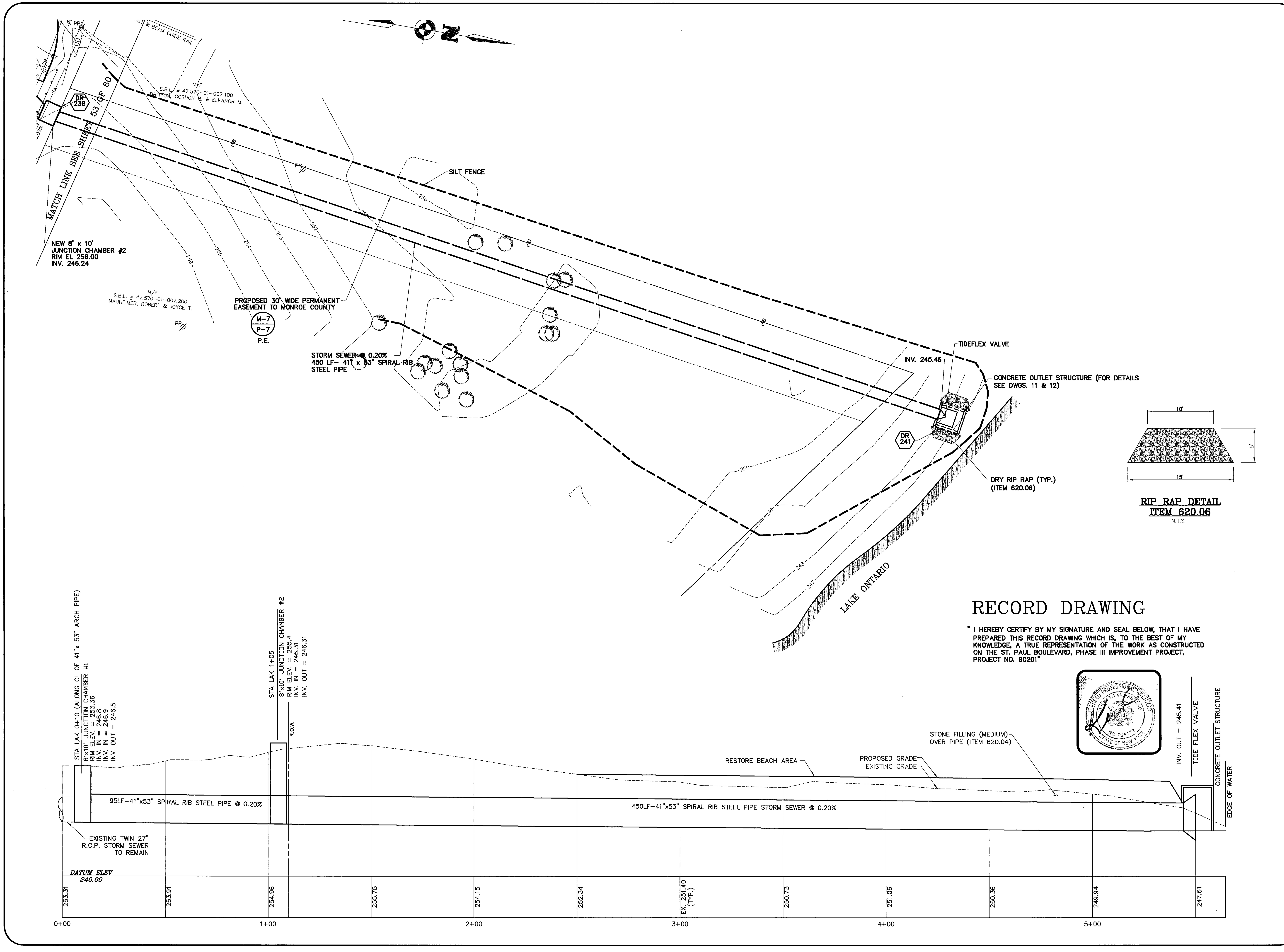
PROJECT: ST. PAUL BOULEVARD-PHASE III
TOWN OF RIGDE/DOT/MONROE COUNTY, STATE OF NEW YORK

DRAWING: PROFILE

CLIENT: MONROE COUNTY DEPARTMENT OF ENGINEERING

Partner in Charge	K.W.P.
Project Manager	D.J.S.
Drawn by	R.W.B.

PROJECT NO. 95017.01
DRAWING NO. 57 OF 80
SCALE HORTZ. 1"=20' VERT. 1"=5'
DATE OCTOBER 1995



RECORD DRAWING

" I HEREBY CERTIFY BY MY SIGNATURE AND SEAL BELOW, THAT I HAVE PREPARED THIS RECORD DRAWING WHICH IS, TO THE BEST OF MY KNOWLEDGE, A TRUE REPRESENTATION OF THE WORK AS CONSTRUCTED ON THE ST. PAUL BOULEVARD, PHASE III IMPROVEMENT PROJECT, PROJECT NO. 90201"

No.	DATE	BY

UNAUTHORIZED ALTERATIONS OR ADDITIONS TO THIS DRAWING IS IN VIOLATION OF STATE EDUCATION LAW ARTICLE 145 SECTION 7209 AND ARTICLE 147 SECTION 7307

PASSERO ASSOCIATES, P.C.
ARCHITECTS-ENGINEERS-SURVEYORS
100 LIBERTY POLE WAY ROCHESTER,N.Y. 14604
716-325-1000

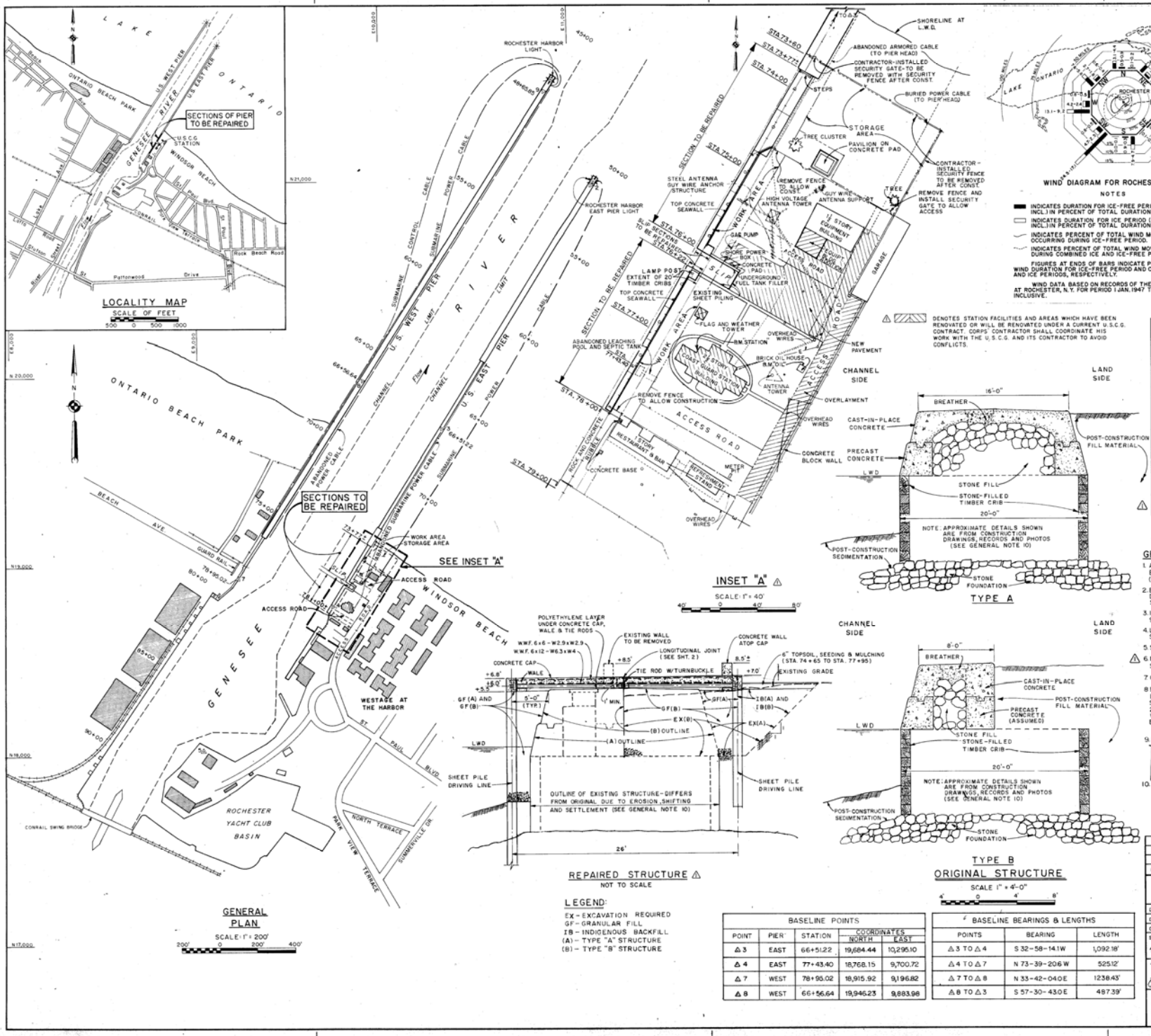
PROJECT: ST. PAUL BOULEVARD-PHASE III
TOWN OF IRONDEQUOIT, MONROE COUNTY, STATE OF NEW YORK

DRAWING: PROPOSED LAKE DISCHARGE PLAN & PROFILE

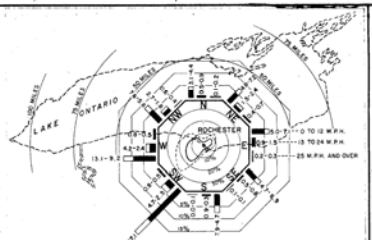
CLIENT: MONROE COUNTY DEPARTMENT OF ENGINEERING

Partner in Charge	K.W.P.
Project Manager	D.J.S.
Drawn by	R.W.B.

PROJECT NO. 95017.01
DRAWING NO. 58 OF 80
SCALE HORTZ. 1"=20' VERT. 1"=5'
DATE OCTOBER 1995



GENERAL PLAN
SCALE: 1" = 200'
200' 0 200' 400'



WIND DIAGRAM FOR ROCHESTER, N.Y.

NOTES

- INDICATES DURATION FOR ICE-FREE PERIOD (MAR. TO DEC. INCL.) IN PERCENT OF TOTAL DURATION.
- INDICATES DURATION FOR ICE PERIOD (JAN. TO FEB. INCL.) IN PERCENT OF TOTAL DURATION.
- INDICATES PERCENT OF TOTAL WIND MOVEMENT OCCURRING DURING ICE-FREE PERIOD.
- INDICATES PERCENT OF TOTAL WIND MOVEMENT OCCURRING DURING COMBINED ICE AND ICE-FREE PERIODS.

FIGURES AT ENDS OF BARS INDICATE PERCENT OF TOTAL WIND DURATION FOR ICE-FREE PERIOD AND COMBINED ICE FREE AND ICE PERIODS, RESPECTIVELY.

WIND DATA BASED ON RECORDS OF THE U.S. COAST GUARD AT ROCHESTER, N.Y. FOR PERIOD 1 JAN. 1947 TO 31 DEC. 1971 INCLUSIVE.

⚠ DENOTES STATION FACILITIES AND AREAS WHICH HAVE BEEN RENOVATED OR WILL BE RENOVATED UNDER A CURRENT U.S.C.G. CONTRACT. CORPS CONTRACTOR SHALL COORDINATE HIS WORK WITH THE U.S.C.G. AND ITS CONTRACTOR TO AVOID CONFLICTS.

INSET "A" ⚠
SCALE: 1" = 40'
40' 0 40' 80'

REPAIRED STRUCTURE ⚠
NOT TO SCALE

TYPE A

TYPE B
ORIGINAL STRUCTURE
SCALE 1" = 4'-0"
4' 0 4' 8'

LEGEND:
EX - EXCAVATION REQUIRED
GF - GRANULAR FILL
IB - INDIGENOUS BACKFILL
(A) - TYPE "A" STRUCTURE
(B) - TYPE "B" STRUCTURE

BASELINE POINTS				
POINT	PIER	STATION	COORDINATES NORTH	COORDINATES EAST
△3	EAST	66+51.22	19,684.44	10,295.10
△4	EAST	77+43.40	18,768.15	9,700.72
△7	WEST	78+95.02	18,915.92	9,196.82
△8	WEST	66+56.64	19,946.23	9,883.98

BASELINE BEARINGS & LENGTHS		
POINTS	BEARING	LENGTH
△3 TO △4	S 32-58-14.1W	1,092.18'
△4 TO △7	N 73-39-20.6 W	525.12'
△7 TO △8	N 33-42-04.0E	1238.43'
△8 TO △3	S 57-30-43.0E	487.39'

INDEX TO DRAWINGS

DRAWING NO.	SHEET NO.	DESCRIPTIONS
85-REP-1/1	1	GENERAL PLAN & INFORMATION
85-REP-1/2	2	LAYOUT & DETAILS
85-REP-1/3	3	DETAILS, SHEET 1 OF 2
85-REP-1/4	4	DETAILS, SHEET 2 OF 2
85-REP-1/5	5	CROSS SECTIONS
85-REP-1/6	6	PLAN OF SUBSURFACE EXPLORATIONS
85-REP-1/7	7	GEOLOGIC PROFILES & SECTIONS
85-REP-1/8	8	DETACHED LOGS

GENERAL NOTES:

1. ALL ELEVATIONS ARE IN FEET AND ARE REFERRED TO LOW WATER DATUM (LWD), ELEVATION 242.8 FEET ABOVE MEAN WATER LEVEL AT FATHER POINT, QUEBEC (1.G.L.D. 1955) (INTERNATIONAL GREAT LAKES DATUM 1955).
2. ELEVATIONS ABOVE LWD ARE PRECEDED BY A PLUS SIGN, THUS +6.0. DEPTHS BELOW LWD ARE PRECEDED BY A MINUS SIGN OR ARE WITHOUT ANY SIGN, THUS -6.0 OR 6.0.
3. INFORMATION PERTAINING TO THE SUBMARINE CABLES IS AVAILABLE FROM THE 9TH COAST GUARD DISTRICT, CLEVELAND, OHIO 44199.
4. LOCATIONS OF TIE RODS AND DRIVING LINES OF STEEL SHEET PILE ARE ON SHEET 2.
5. STRUCTURAL DETAILS ARE ON SHEETS 3 AND 4.
6. ⚠ PROBINGS AND BORINGS FOR THE PIER SECTIONS TO BE REPAIRED ARE ON SHEETS 6, 7 AND 8.
7. CROSS-SECTIONS FOR THE PIER SECTIONS TO BE REPAIRED ARE ON SHEET 5.
8. BENCH MARKS:
   B.M. "OIL" IS A U.S. LAKE SURVEY DISC SET INTO THE DOWNRIVER WALL OF A SMALL BRICK OIL HOUSE, 156' FROM THE RIVER FACE OF PIER. ELEVATION = 252.010 FEET. B.M. "STATION" IS A U.S. LAKE SURVEY DISC SET INTO THE RIVER WALL OF MAIN COAST GUARD BUILDING, 55.5' FROM THE RIVER FACE OF PIER. ELEVATION = 251.278 FEET.
9. LIMITS OF ORIGINAL STRUCTURES SHOWN ON THIS SHEET:

TYPE A	TYPE B
STA. 73+77 TO 74+77	STA. 74+77 TO 75+90
STA. 75+90 TO 76+00	STA. 76+32 TO 78+00
STA. 76+22 TO 76+32	

10. OLD CONSTRUCTION DRAWINGS INDICATE A STONE FOUNDATION BELOW THE ORIGINAL TIMBER CRIB. SUBSURFACE INFORMATION INDICATES THAT THIS MATERIAL EXISTS ON BOTH SIDES OF THE CRIB. IN ADDITION, RUBBLE, STONE & SUBMERGED TIMBER PILES CAN BE FOUND ALONG THE CHANNEL FACE. THE CONTRACTOR SHALL REMOVE THESE OBSTRUCTIONS AND DRIVE THE PILE TO THE SPECIFIED PENETRATION.

REVISION	DATE	DESCRIPTION	BY
⚠		REVISED INDEX, GENERAL NOTE 6, SHEET NUMBER; MISCELLANEOUS CHANGES, CORRECTIONS OR ADDITIONS TO INSET "A" AND SECTION SHOWING REPAIRED STRUCTURE.	

U.S. ARMY ENGINEER DISTRICT, BUFFALO
CORPS OF ENGINEERS
BUFFALO, NEW YORK 14207

DRAWN BY: J.H.R.
DESIGNED BY: P.J.K.
CHECKED BY: G.B.B.
SUBMITTED BY: Chief, Design Branch
APPROVAL RECOMMENDED: Chief, Engineering Division

ROCHESTER HARBOR
ROCHESTER, NEW YORK
EAST PIER REPAIR

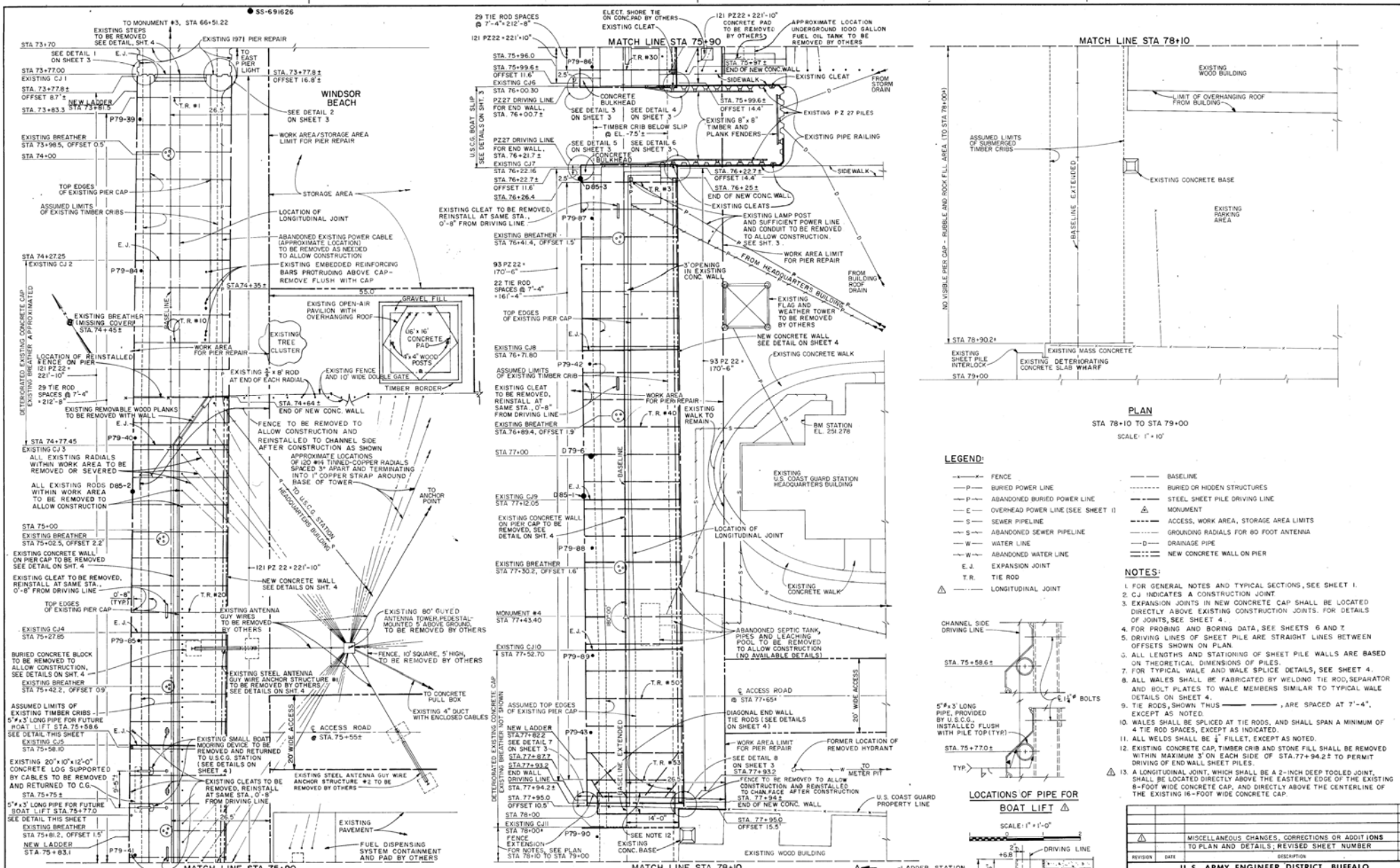
GENERAL PLAN & INFORMATION

APPROVED: Col, CE District Commander
DATE: 17 May 85

TO ACCOMPANY SPECIFICATIONS SERIAL NO. DACW 49 85 B 0030

SCALE: AS SHOWN

DRAWING NUMBER 85-REP-1/1
SHEET 1 OF 8 ⚠



REVISION	DATE	DESCRIPTION	BY
		MISCELLANEOUS CHANGES, CORRECTIONS OR ADDITIONS TO PLAN AND DETAILS; REVISED SHEET NUMBER	

U.S. ARMY ENGINEER DISTRICT, BUFFALO
CORPS OF ENGINEERS
BUFFALO, NEW YORK 14207

DRAWN BY: J.R.A. J.H.R.
DESIGNED BY: R.J.K.
CHECKED BY: G.B.B.
SUBMITTED BY:
CHIEF, DESIGN BRANCH
APPROVAL RECOMMENDED:
CHIEF, ENGINEERING DIVISION

ROCHESTER HARBOR
ROCHESTER, NEW YORK
EAST PIER REPAIR
LAYOUT and DETAILS

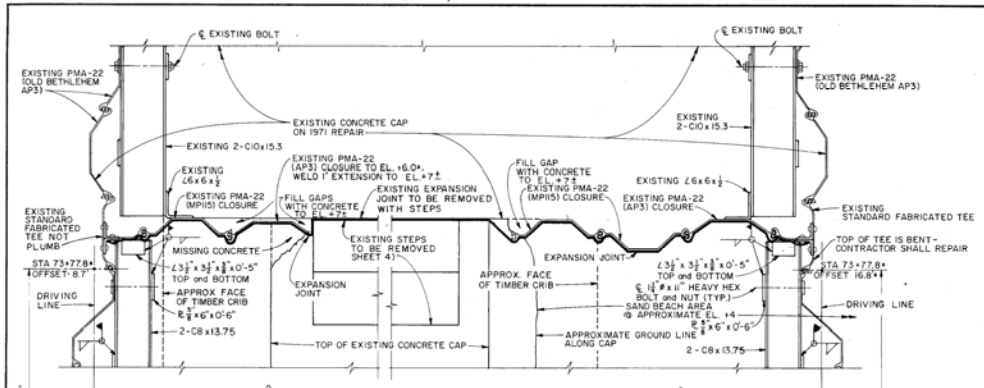
APPROVED:
COL, C.E. DISTRICT COMMANDER
DATE: 17 May 88

SCALE: AS SHOWN

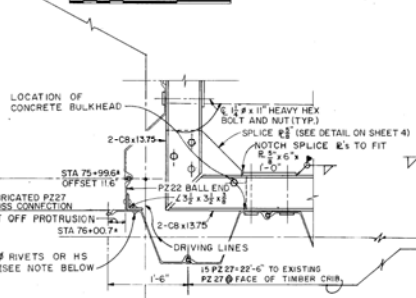
TO ACCOMPANY SPECIFICATIONS SERIAL NO. DACW 49 85 B 0030

DRAWING NUMBER 85-REP-1/2

SHEET 2 OF 8

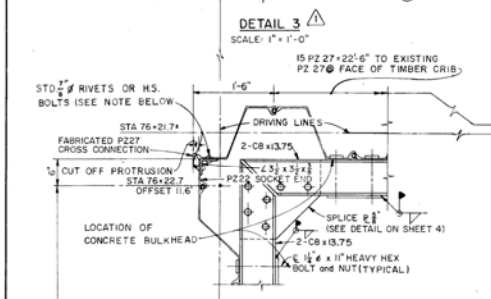


DETAIL 1 ⚠
SCALE: 1" = 1'-0"



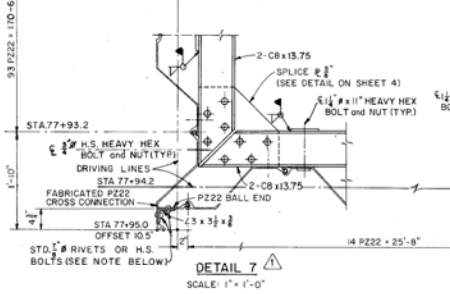
DETAIL 3 ⚠
SCALE: 1" = 1'-0"

DETAIL 2 ⚠
SCALE: 1" = 1'-0"



DETAIL 5 ⚠
SCALE: 1" = 1'-0"

DETAIL 6 ⚠
SCALE: 1" = 1'-0"



DETAIL 7 ⚠
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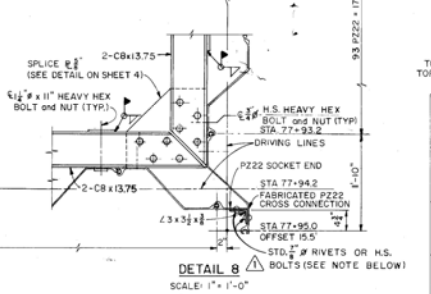
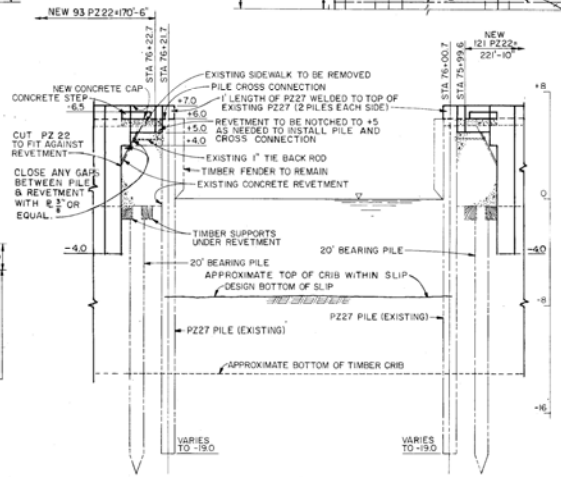
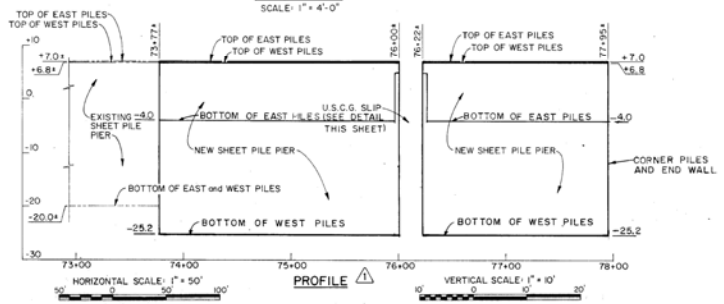


DETAIL 8 ⚠
SCALE: 1" = 1'-0"

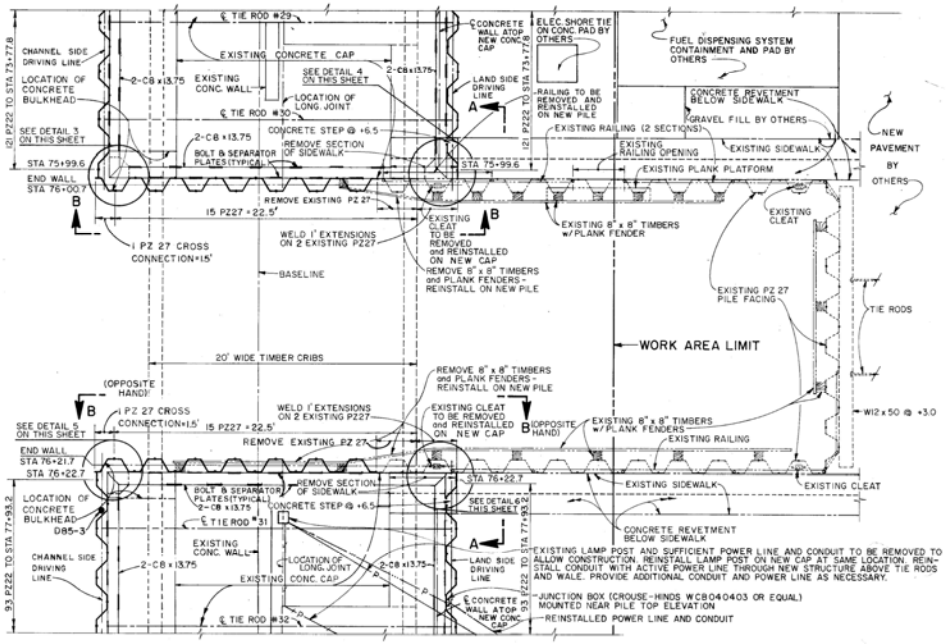
NOTE: SHOP FABRICATED CROSS CONNECTIONS SHALL HAVE STANDARD ⅞"ø RIVETS OR HIGH STRENGTH BOLTS, WHICH SHALL BE SPACED 3" MAXIMUM FOR 2' ON EACH END AND 6" MAXIMUM FOR REMAINDER OF PILE.



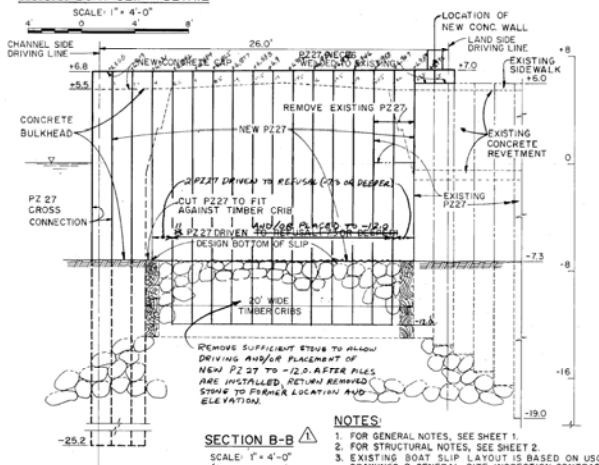
SECTION A-A ⚠
SCALE: 1" = 4'-0"



PROFILE ⚠



U.S.C.G. BOAT SLIP - DETAIL ⚠
SCALE: 1" = 4'-0"



SECTION B-B ⚠
SCALE: 1" = 4'-0"
(SEE AMEND. # 1)

NOTES:
1. FOR GENERAL NOTES, SEE SHEET 1.
2. FOR STRUCTURAL NOTES, SEE SHEET 2.
3. EXISTING BOAT SLIP LAYOUT IS BASED ON USCG DRAWINGS & GENERAL SITE INSPECTION, CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING CRIB STRUCTURE AND PZ 27 PILE FACING BEFORE FABRICATION OF CROSS CONNECTIONS AND LAYOUT OF NEW CONSTRUCTION.

REVISION	DATE	DESCRIPTION	BY
⚠		MISCELLANEOUS CHANGES, CORRECTION OR ADDITIONS TO ALL DETAILS AND SECTIONS, REVISED SHEET NUMBER	

U.S. ARMY ENGINEER DISTRICT, BUFFALO
CORPS OF ENGINEERS
BUFFALO, NEW YORK 14207

DRAWN BY: J.R.A. J.H.R.
DESIGNED BY: P.J.K.
CHECKED BY: G.B.B.
SUBMITTED BY: Chief, Design Branch
APPROVAL RECOMMENDED:
Chief, Engineering Division

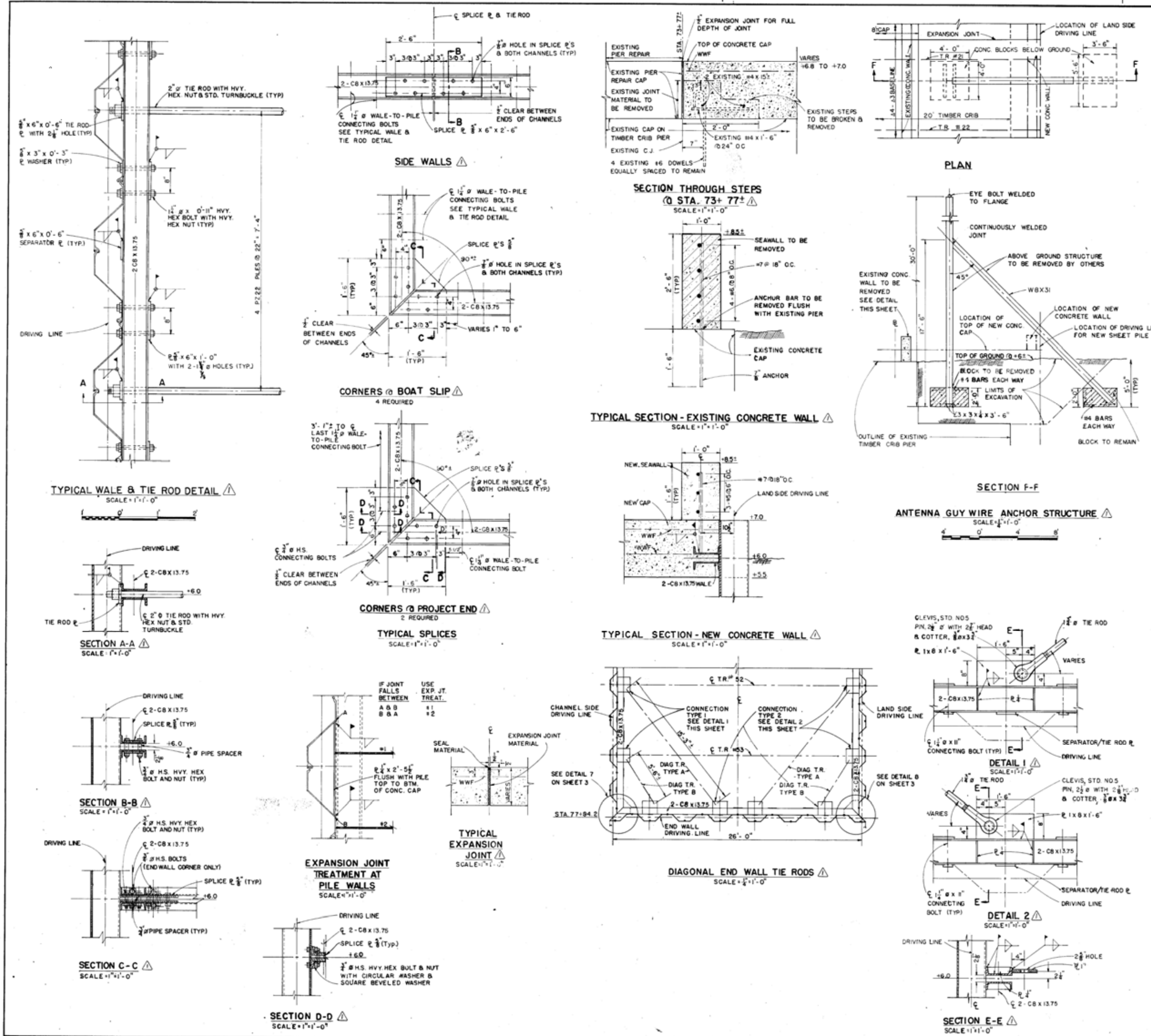
ROCHESTER HARBOR
ROCHESTER, NEW YORK
EAST PIER REPAIR
DETAILS, SHEET 1 OF 2

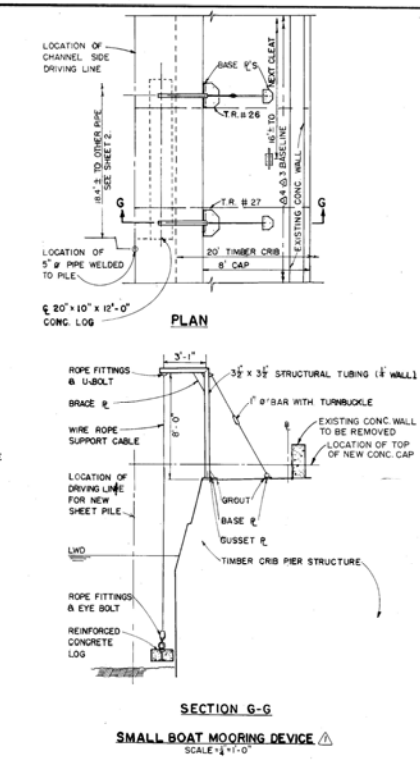
APPROVED: Col, U.S. District Commander
DATE: 17 May 85

TO ACCOMPANY SPECIFICATIONS SERIAL NO. DACW 49 85 B 0030

SCALE: AS SHOWN

DRAWING NUMBER 85-REP-1/3
SHEET 3 OF 8 ⚠





NOTES

1. FOR GENERAL NOTES, SEE SHEET 1.
2. FOR STRUCTURAL NOTES, SEE SHEET 2.
3. CONTRACTOR SHALL REMOVE AND RETURN TO COAST GUARD STATION ALL COMPONENTS OF SMALL BOAT MOORING DEVICE

REVISION	DATE	DESCRIPTION	BY
△		REVISED SHEET NUMBER AND MISCELLANEOUS CHANGES, CORRECTIONS OR ADDITIONS TO ALL DETAILS	

U. S. ARMY ENGINEER DISTRICT, BUFFALO
CORPS OF ENGINEERS
BUFFALO, NEW YORK 14207

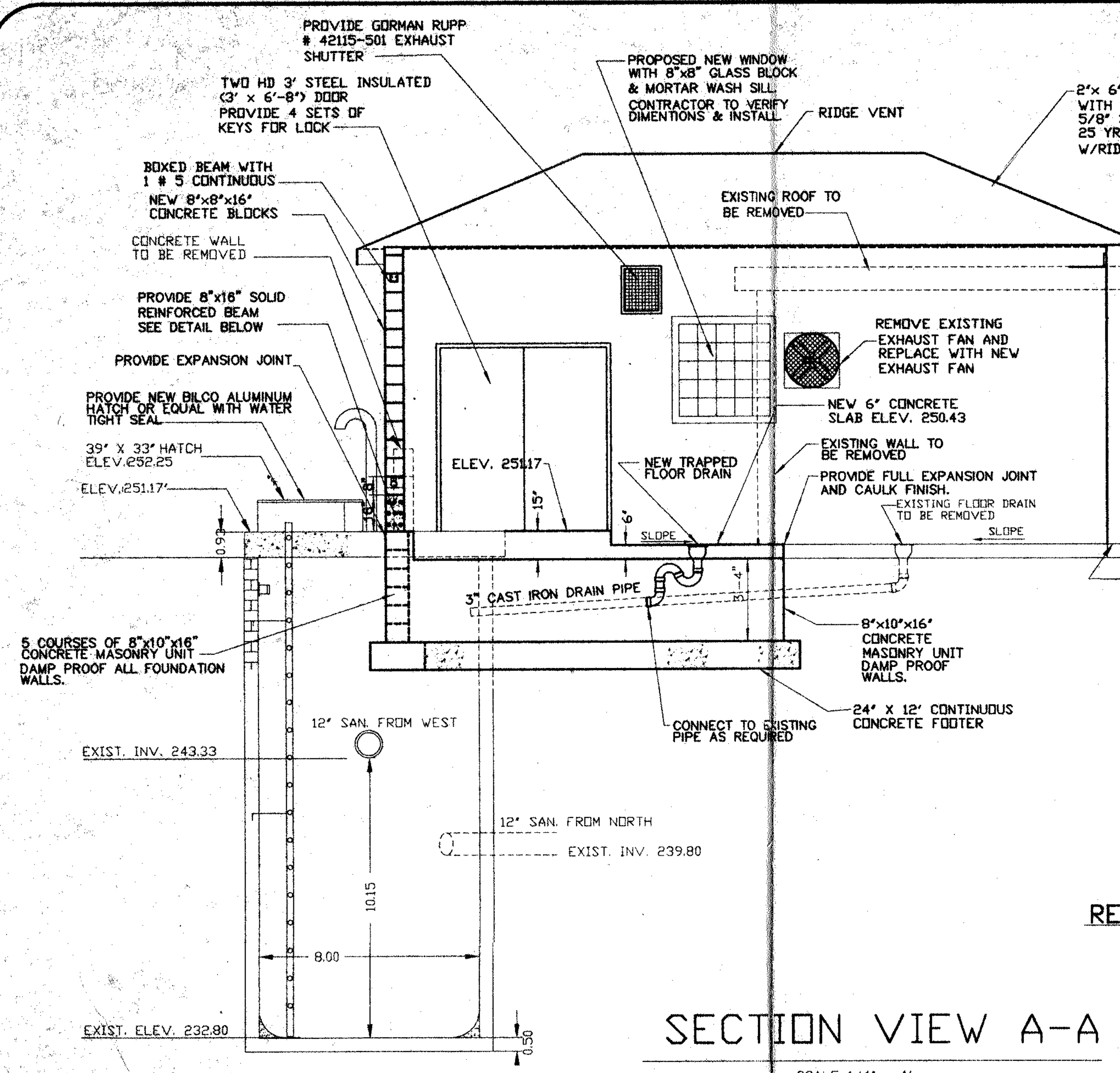
DRAWN BY: C.M.H.
DESIGNED BY: P.J.K.
CHECKED BY: G.B.B.
SUBMITTED BY: CHIEF, DESIGN BRANCH
APPROVAL RECOMMENDED: CHIEF, ENGINEERING DIVISION
APPROVED: LTC, EN, COL. C.E. DISTRICT COMMANDER
DATE: 17 JUNE 85

ROCHESTER HARBOR
ROCHESTER, NEW YORK
EAST PIER REPAIR
DETAILS, SHEET 2 OF 2

SCALE: AS SHOWN

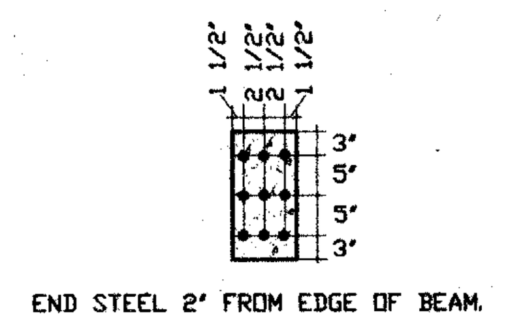
TO ACCOMPANY SPECIFICATIONS SERIAL NO. DACW 49 85 B 0030

DRAWING NUMBER 85-REP-1/4
SHEET 4 OF 8 △



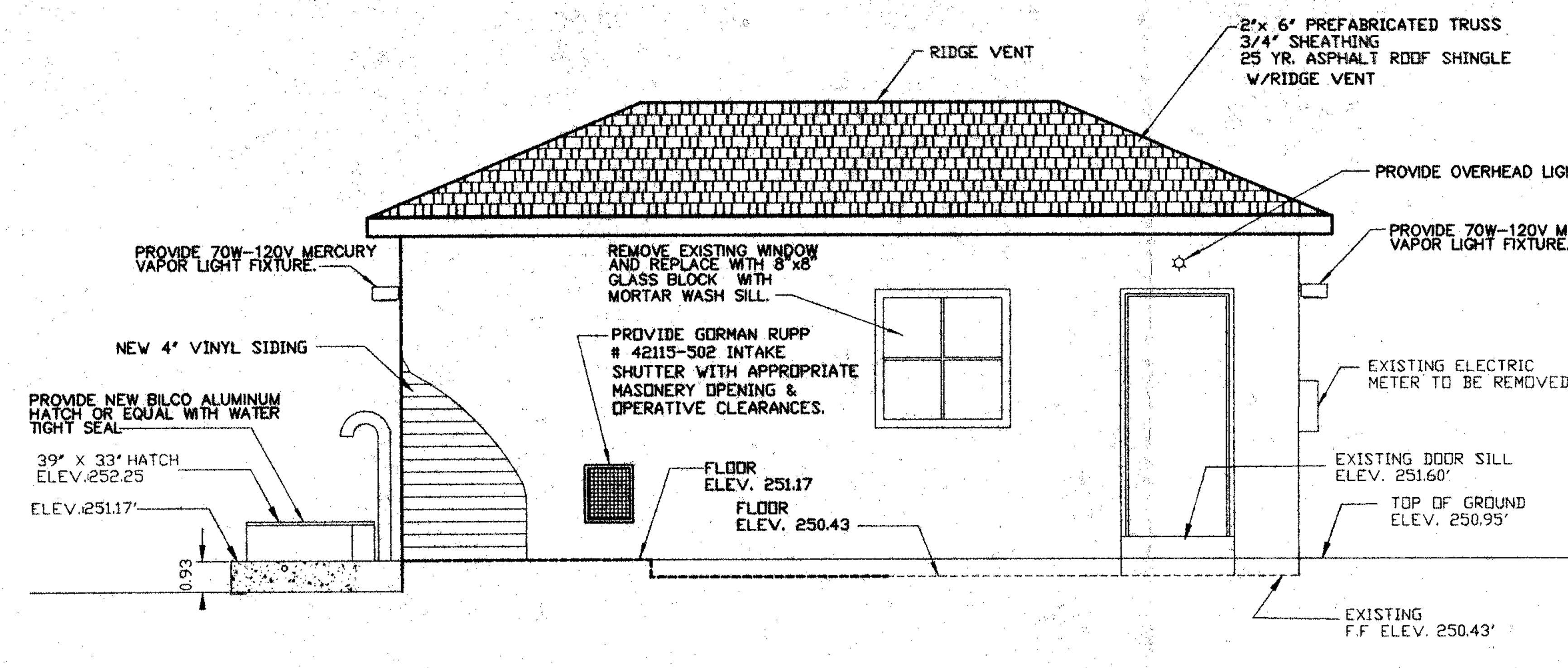
SECTION VIEW A-A

SCALE 1/4" = 1'



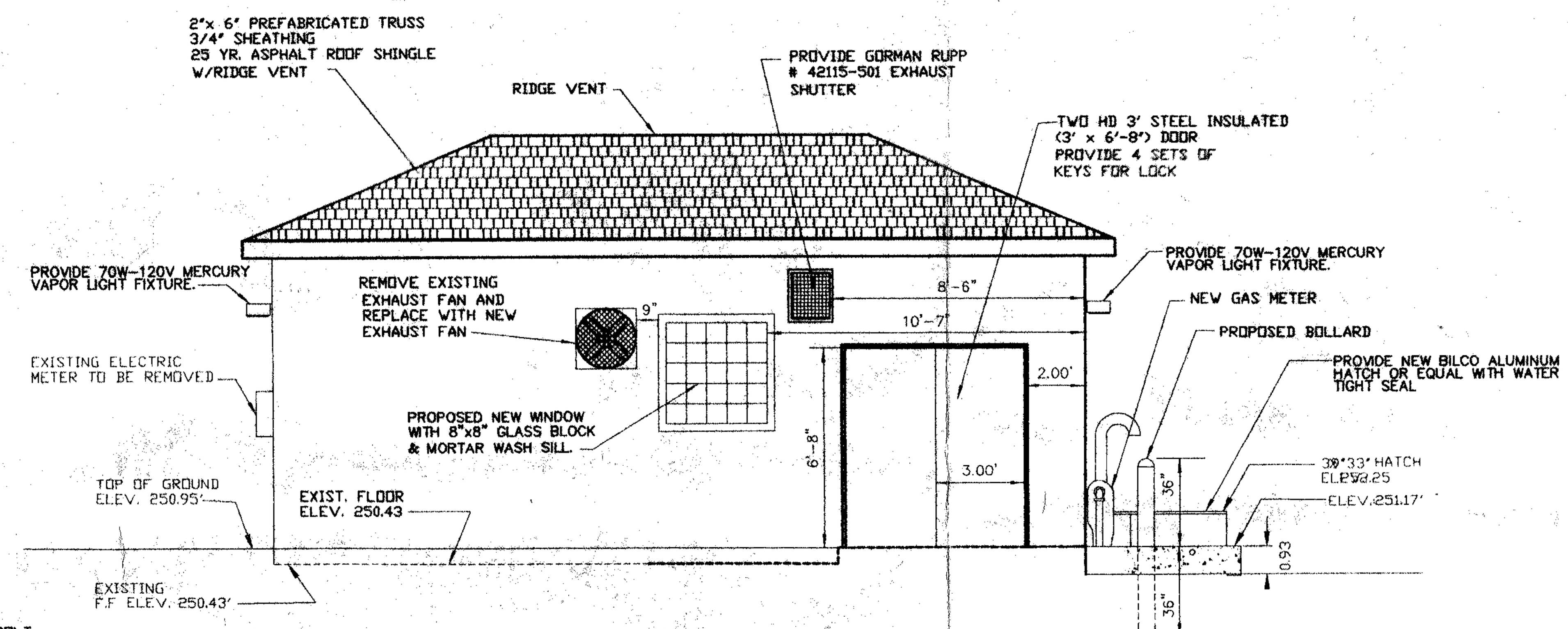
REINFORCED CONCRETE BEAM STEEL BARS SPACING

SCALE 1/2" = 1'



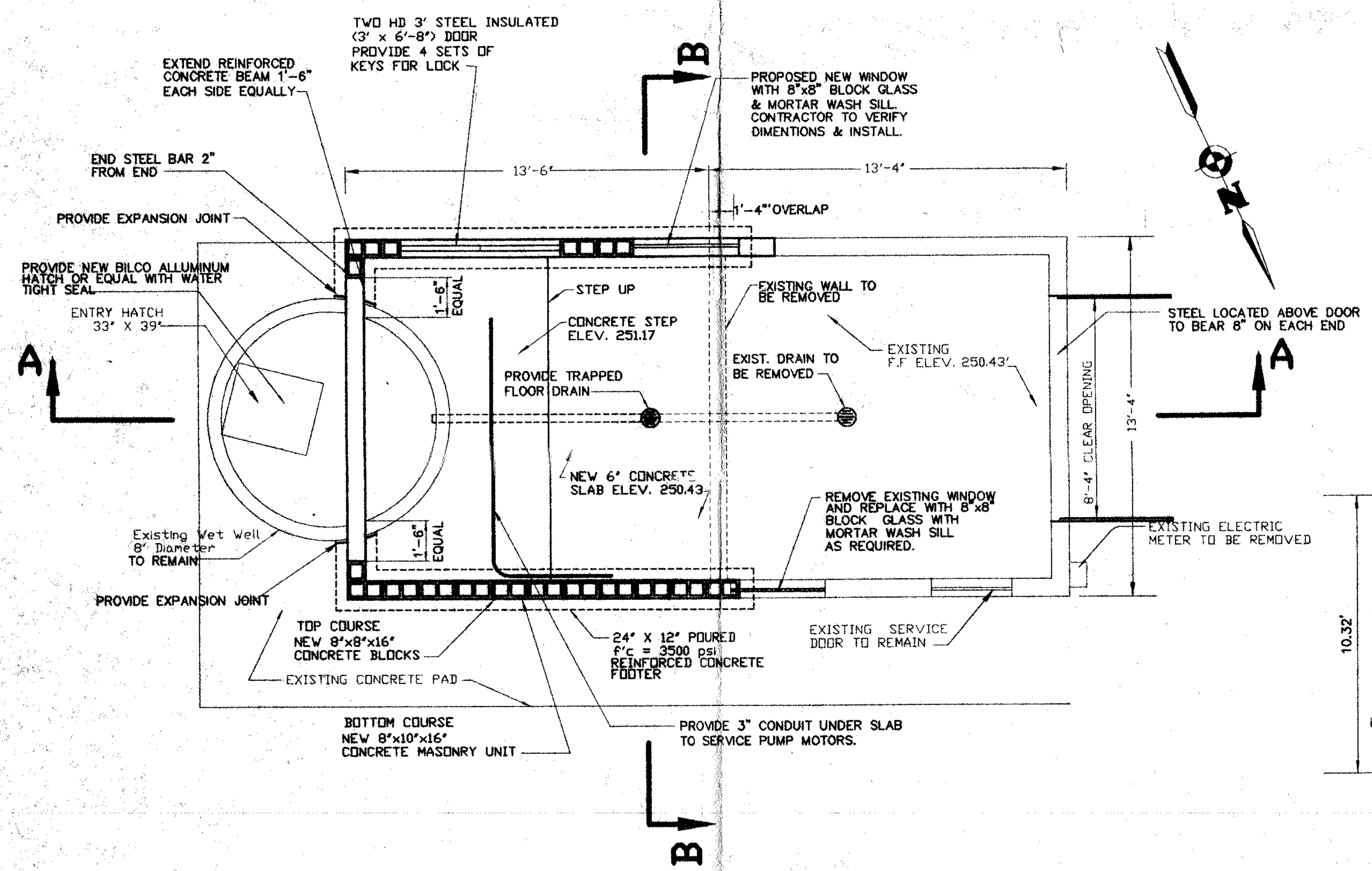
NORTH ELEVATION

SCALE 1/4" = 1'



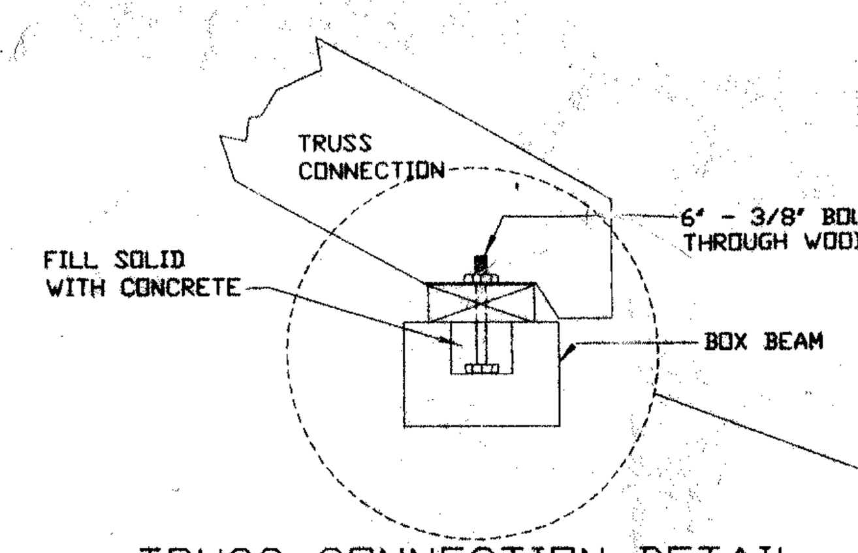
SOUTH ELEVATION

SCALE 1/4" = 1'

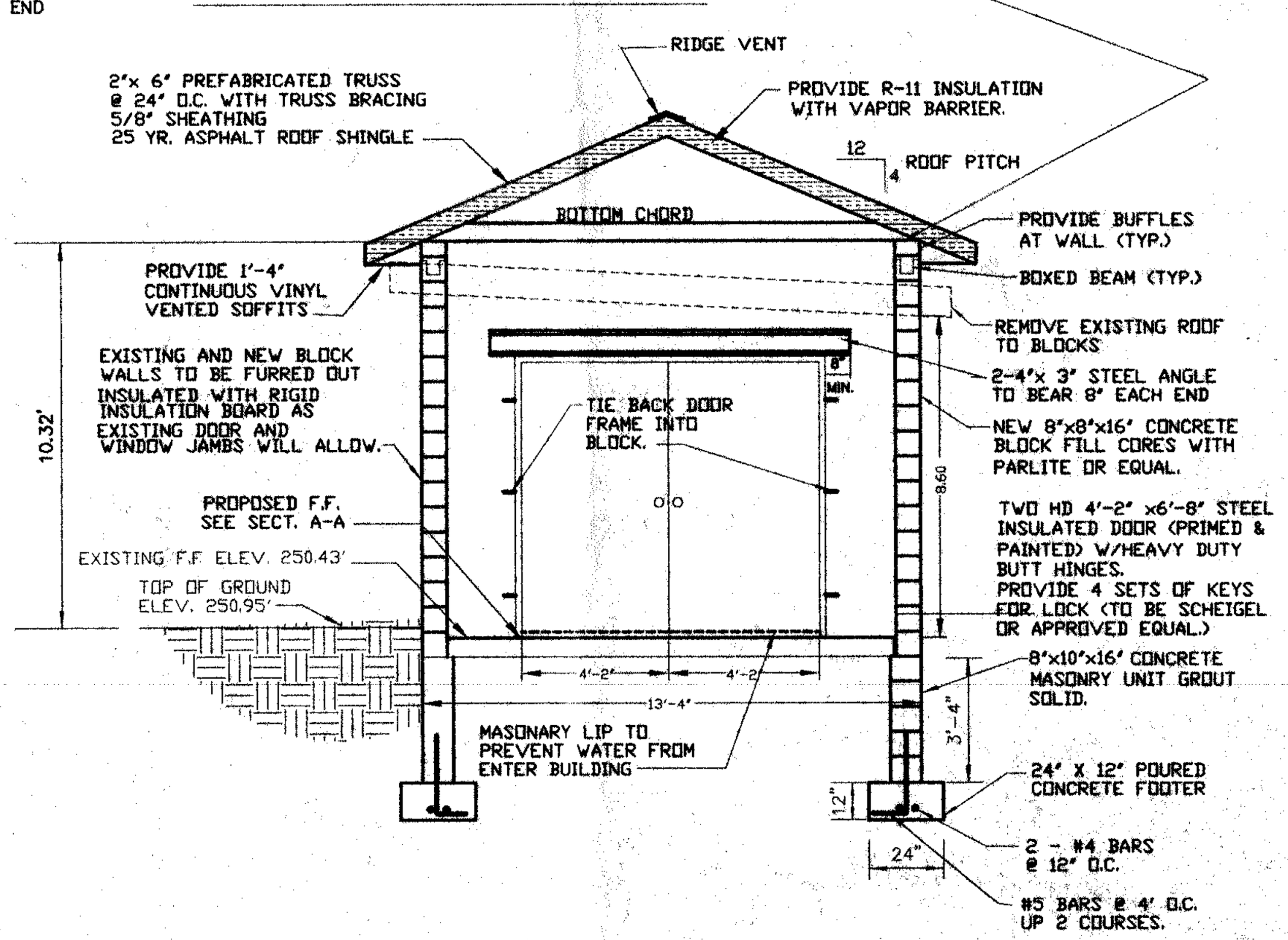


PLAN VIEW

SCALE 1/4" = 1'

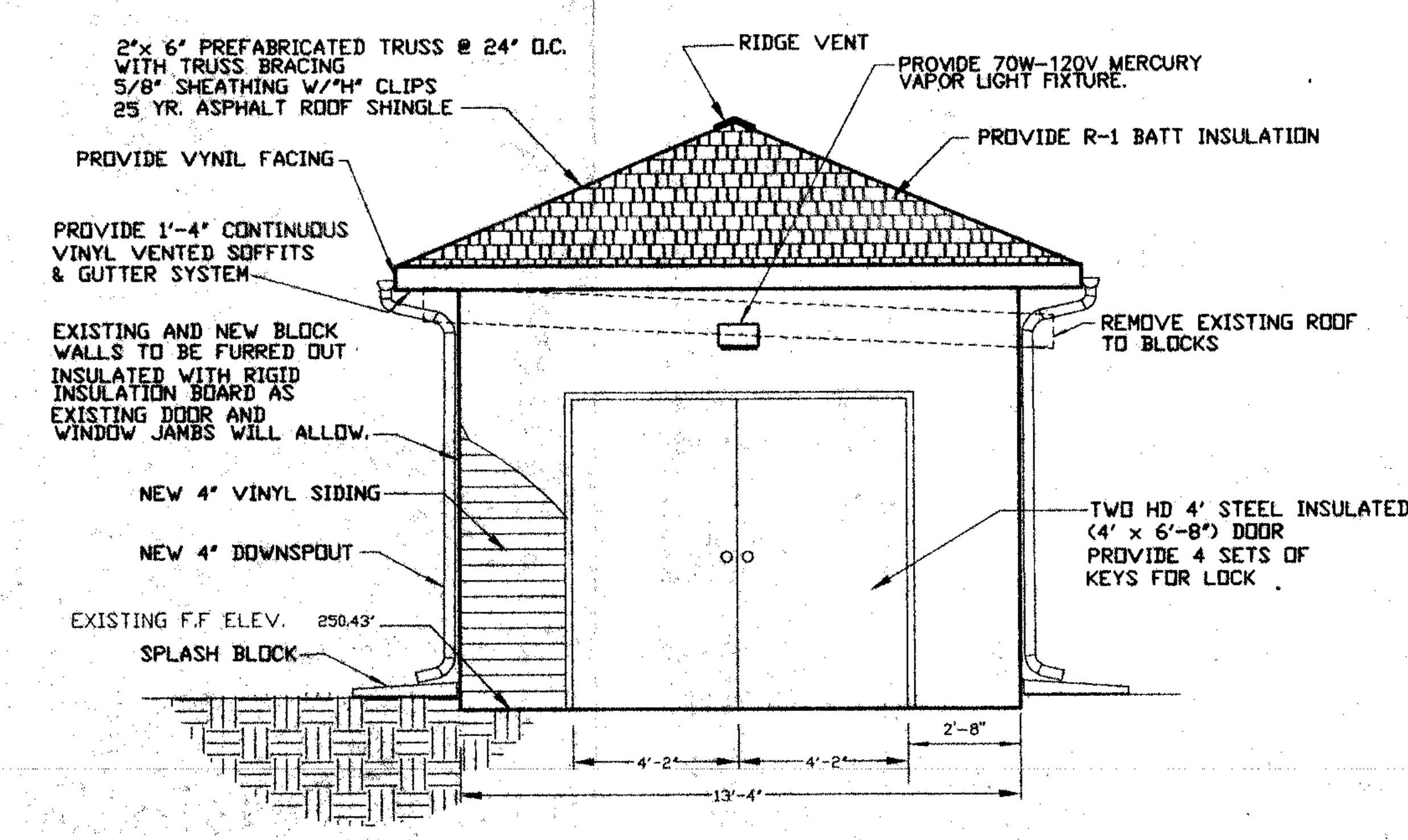


TRUSS CONNECTION DETAIL



SECTION VIEW B-B

SCALE 1/4" = 1'

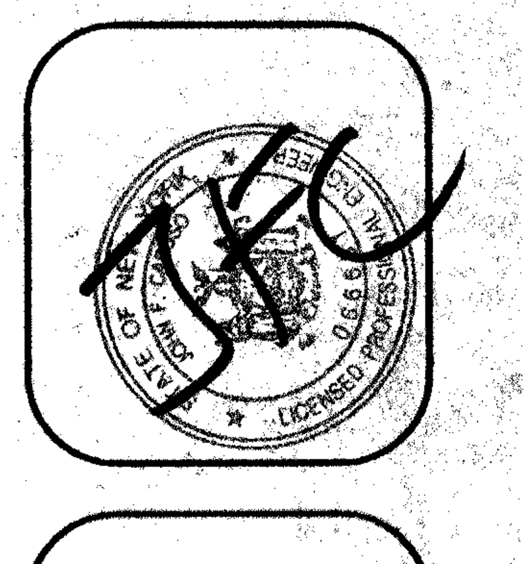


WEST ELEVATION

SCALE 1/4" = 1'

No.	DATE	BY	REVISION
1	8/17/98	M.B.	REVISED PER TOWN COMMENTS.

UNAUTHORIZED ALTERATIONS OR ADDITIONS TO THIS DRAWING IS IN VIOLATION OF STATE EDUCATION LAW ARTICLE 145 SECTION 7209 AND ARTICLE 147 SECTION 7307



PASSERO ASSOCIATES, P.C.
ARCHITECTS-ENGINEERS-SURVEYORS
100 LIBERTY POLE WAY ROCHESTER,N.Y. 14604
716-325-1000

PROJECT: SUMMERVILLE PUMP STATION
TOWN OF IRONDEQUOIT, MONROE COUNTY, STATE OF NEW YORK

DRAWING: BUILDING STRUCTURE IMPROVEMENTS

CLIENT: TOWN OF IRONDEQUOIT
1280 TITUS AVENUE
ROCHESTER, N.Y. 14617
TELEPHONE #(716) 467-8840

Partner in Charge: J.F.C.
Project Manager: J.F.C.
Drawn by: M.B.

PROJECT NO. 97649.05
DRAWING NO. 7 OF 9
SCALE AS NOTED
DATE JULY, 1998

C:\DWG\SUMMERV\SUMDET Mon Aug 17 13:38:01 1998 MB

Appendix C

Public and Stakeholder Involvement Summary

Appendix C - Public and Stakeholder Involvement Summary

The REDI Program encompassed a near-term action phase of the initiative by reporting the processes and outcomes of the establishment and efforts of regional planning committees, teams, and stakeholders, community meetings, the prioritization and vetting of projects recommended by the planning committees, and the development of conceptual designs of selected projects. Planning committees were made up of local leaders, including local agency representatives, elected officials, and town supervisors, whose role was to gather community input, facilitate discussions, identify priorities, and recommend projects to the REDI Commission. Projects identified by the planning committees were further vetted with respect to efficacy, feasibility, relevance to REDI, permitting concerns and cost by experts within New York's agencies. Four regional meetings, up to three planning committee meetings, and township meetings were convened in each of the five REDI Regions (Niagara and Orleans, Monroe, Wayne, Cayuga and Oswego, and Jefferson and St. Lawrence) to discuss planning for addressing immediate and long-term resiliency needs and identifying assets at risk for the regions. The prioritization of needs and projects was also advanced at these meetings. A summary of the public and stakeholder meeting dates is provided in Table C.1

Table C.1 *REDI Public Stakeholder and Planning Committee Meeting Dates Held During 2019 for Each of the Five Regions*

Region	Stakeholder Meetings	Planning Committee Meetings/Calls
Niagara Orleans	1. July 10, 2019 2. July 30, 2019 3. Aug 27, 2019 4. Sept 9, 2019	1. Aug 8, 2019 2. Aug 12, 2019 3. Sept 6, 2019
Monroe	1. July 10, 2019 2. July 31, 2019 3. Aug 26, 2019 4. Sept 9, 2019	1. Aug 13, 2019 2. Aug 21, 2019 3. Sept 5, 2019
Wayne	1. July 11, 2019 2. July 24, 2019 3. Aug 29, 2019 4. Sept 11, 2019	1. Aug 9, 2019 2. Aug 16, 2019 3. Aug 22, 2019
Cayuga Oswego	1. July 10, 2019 2. July 29, 2019 3. Aug 29, 2019 4. Sept 10, 2019	1. Aug 13, 2019 2. Aug 19, 2019 3. Sept 6, 2019
Jefferson St. Lawrence	1. July 12, 2019 2. Aug 2, 2019 3. Aug 26, 2019 4. Sept 12, 2019	1. Aug 7, 2019 2. Aug 14, 2019 3. Aug 22, 2019 4. Sept 3, 2019

Appendix D

Smart Growth Assessment Form

NEW YORK STATE OF OPPORTUNITY. | Department of Health | Environmental Facilities Corporation

Smart Growth Assessment Form

This form should be completed by the applicant's project engineer or other design professional.[1]

Applicant Information

Applicant: City of Rochester Project No.: MO.03

Project Name: St. Paul Terminus

Is project construction complete? ☐ Yes, date: ☑ No

Project Summary: (provide a short project summary in plain language including the location of the area the project serves)

This project is located near the mouth of the Genesee River in Rochester, NY and is composed of flood protection measures (flood walls/berms) and stormwater management improvements. The project serves the City of Rochester and Town of Irondequoit.

Section 1 – Screening Questions

1. Prior Approvals

1A. Has the project been previously approved for EFC financial assistance? ☐ Yes ☑ No

1B. If so, what was the project number(s) for the prior approval(s)? Project No.:

Is the scope of the project substantially the same as that which was approved? ☐ Yes ☑ No

IF THE PROJECT WAS PREVIOUSLY APPROVED BY EFC'S BOARD AND THE SCOPE OF THE PROJECT HAS NOT MATERIALLY CHANGED, THE PROJECT IS **NOT** SUBJECT TO SMART GROWTH REVIEW. SKIP TO SIGNATURE BLOCK.

2. New or Expanded Infrastructure

2A. Does the project add new wastewater collection/new water mains or a new wastewater treatment system/water treatment plant? ☐ Yes ☑ No

Note: A new infrastructure project adds wastewater collection/water mains or a wastewater treatment/water treatment plant where none existed previously

2B. Will the project result in either: ☐ Yes ☑ No

An increase of the State Pollutant Discharge Elimination System (SPDES) permitted flow capacity for an existing treatment system;

OR

An increase such that a NYSDEC water withdrawal permit will need to be obtained or modified, or result in the NYSDOH approving an increase in the capacity of the water treatment plant?

Note: An expanded infrastructure project results in an increase of the SPDES permitted flow capacity for the wastewater treatment system, or an increase of the permitted water withdrawal or the permitted flow capacity for the water treatment system.

[1] If project construction is complete and the project was not previously financed through EFC, an authorized municipal representative may complete and sign this assessment.

IF THE ANSWER IS "NO" TO BOTH "2A" and "2B" ON THE PREVIOUS PAGE, THE PROJECT IS NOT SUBJECT TO FURTHER SMART GROWTH REVIEW. SKIP TO SIGNATURE BLOCK.

3. Court or Administrative Consent Orders

3A. Is the project expressly required by a court or administrative consent order? ☐ Yes ☐ No

3B. If so, have you previously submitted the order to NYS EFC or DOH? If not, please attach. ☐ Yes ☐ No

Section 2 – Additional Information Needed for Relevant Smart Growth Criteria

EFC has determined that the following smart growth criteria are relevant for EFC-funded projects and that projects must meet each of these criteria to the extent practicable:

1. Uses or Improves Existing Infrastructure

1A. Does the project use or improve existing infrastructure? ☐ Yes ☐ No

Please describe:

2. Serves a Municipal Center

Projects must serve an area in either 2A, 2B or 2C to the extent practicable.

2A. Does the project serve an area **limited** to one or more of the following municipal centers?

i. A City or incorporated Village ☐Yes ☐No

ii. A central business district ☐Yes ☐No

iii. A main street ☐Yes ☐No

iv. A downtown area ☐Yes ☐No

v. A Brownfield Opportunity Area ☐Yes ☐No
(for more information, go to www.dos.ny.gov & search "Brownfield")

vi. A downtown area of a Local Waterfront Revitalization Program Area ☐Yes ☐No
(for more information, go to www.dos.ny.gov and search "Waterfront Revitalization")

vii. An area of transit-oriented development ☐Yes ☐No

viii. An Environmental Justice Area ☐Yes ☐No
(for more information, go to www.dec.ny.gov/public/899.html)

ix. A Hardship/Poverty Area ☐Yes ☐No
Note: Projects that primarily serve census tracts and block numbering areas with a poverty rate of at least twenty percent according to the latest census data

Please describe all selections:

2B. If the project serves an area located outside of a municipal center, does it serve an area located adjacent to a municipal center which has clearly defined borders, designated for concentrated development in a municipal or regional comprehensive plan and exhibit strong land use, transportation, infrastructure and economic connections to an existing municipal center? ☐Yes ☐No

Please describe:

2C. If the project is not located in a municipal center as defined above, is the area designated by a comprehensive plan and identified in zoning ordinance as a future municipal center? ☐Yes ☐No

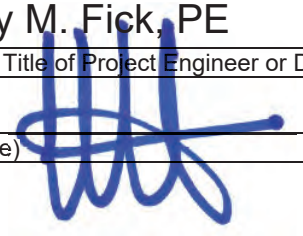
Please describe and reference applicable plans:

3. Resiliency Criteria

3A. Was there consideration of future physical climate risk due to sea-level rise, storm surge, and/or flooding during the planning of this project? ☐Yes ☐No

Please describe:

Signature Block: By entering your name in the box below, you agree that you are authorized to act on behalf of the applicant and that the information contained in this Smart Growth Assessment is true, correct and complete to the best of your knowledge and belief.

Applicant: City of Rochester	Phone Number: 585-295-7716
Jeffrey M. Fick, PE	
(Name & Title of Project Engineer or Design Professional or Authorized Municipal Representative)	
	02/14/2020
(Signature)	(Date)


PDG
POPLI DESIGN GROUP