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CAPITAL ASSET RENEWAL PLAN 2070

PORT MILWAUKEE

AUGUST 2021

WISCONSIN COASTAL MANAGEMENT PROGRAM

NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION U.S. DEPARTMENT OF COMMERCE

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1. INTRODUCTION

1.1 PURPOSE AND SCOPE OF PLAN

In 2020 Port Milwaukee began the process of establishing a Capital Asset Renewal Plan (CARP) to comprehensively address deficiencies in port facilities and infrastructure and establish a maintenance and replacement schedule. The CARP serves as a tool for Port Milwaukee to strategically plan significant improvements to port facilities and develop funding strategies for long-term asset repair and replacement.

This plan is developed to provide a high level, long-term action plan for asset renewal for a 50-year period and considers key factors influencing asset renewal planning at the port including the port's goals, stakeholder input, and long-term trends in coastal conditions and infrastructure resiliency to those conditions. The initial plan, developed in 2020/2021 timeframe, projects asset renewals through the year 2070. As part of a process of continuous improvement and update, the plan is intended to be updated at a regular interval and the planning period extended accordingly to maintain a 50-year planning horizon.

The scope of this CARP addresses port assets within the boundaries of its South Harbor Tract and North Harbor Tract (**Error! Reference source not found.** and Figure 2, respectively) including navigational areas within adjacent waterways.

Figure 1 - South Harbor Tract Boundary

Figure 2 - North Harbor Tract Boundary

Port infrastructure assets are organized into 10 primary categories. A description of the categories and types of assets included in the category is provided in Table 1.

Table 1 - Asset Category Description

Asset Category	Description
Buildings	The building asset category includes all terminals, warehouses, office buildings, and commercial structures owned by the port. Buildings in this asset category include both leased and non-leased structures. The category also includes some building structures associated with bare-ground lease arrangements whereby tenant has constructed and/or is responsible for their maintenance and renewal. Site features such as parking lots, walkways, and lighting associated with a particular building asset are included in this category.
Dockwalls	The dockwall asset category includes all port owned waterfront structures. These assets include steel sheet pile dockwalls as well as stone revetments, the liquid cargo pier, Russell Ave pier, and Pier Wisconsin.
Navigational Areas (Dredge Requirement)	The navigational area asset category consists of the maintained minimum water depths, or drafts, at the port's berths and channels. Drafts are maintained by the port through dredging. Depths within the federal harbor and channel maintained by US Army Corps of Engineers are not included in this category

Asset Category	Description
Fencing	The fencing asset category includes fencing and gates on the South Harbor Tract along roadways and surrounding port parcels. Fencing is largely security-type galvanized chain link fencing with 2 and 3 strand barbed wire.
Green Infrastructure & Public Spaces	Port assets in the green infrastructure category primarily include storm water management facilities and public waterfront access spaces. Public spaces include North Urban Park and waterfront access along the dockwall between the CDF and Liquid Cargo Pier. Additionally, waterside public space is available at the Lake Express dockwall and on Russell Avenue Pier. Kaszube's Park is not included since it is maintained by the City of Milwaukee.
Lighting	Lighting assets include area lights over Port rail and paved areas such as the City Heavy Lift Dock. Lighting associated with building sites is captured in the building asset category. Streetlights are maintained by another department of the City of Milwaukee.
Pavement and Roads	The pavement and roads category includes Port service drives in the South Harbor Tract as well as concrete and asphalt pavement areas not associated with building assets, such as the City Heavy Lift Dock.
Rail	The Rail asset category includes leased and non-leased rail, switches, crossings, and other rail system appurtenances.
Utilities	The utilities category includes port-owned and maintained water distribution system, sanitary sewer system, and storm sewer system.
Vehicles, Vessels, Cranes, and Other Equipment	Assets include in this category generally include fleet vehicles, workboats, survey boat, cranes, and mobile safety equipment.

Port assets located in the North Harbor Tract consist of dockwalls, navigational areas, public space, lighting, and utilities largely associated with Pier Wisconsin. The port does not have any building, rail, pavement, or road assets in the North Harbor Tract. Operations on the North Harbor Tract are primarily associated with lease agreements for the entities such as Henry Maier Festival Grounds, Lakeshore State Park, Discovery World, and Harbor House restaurant.

1.2 CONTEXT OF THE PLAN

1.2.1 Audit of Port Milwaukee Capital Assets

In September 2020, the City of Milwaukee conducted an audit of Port Milwaukee capital assets which concluded that the "identified internal controls in place over Port capital assets are sufficient and in the growth stage". The audit also produced several recommendations for improvement of Port Milwaukee capital asset management. The CARP was developed to support the Port in implementing the recommendations. Specifically, the CARP will:

- Reconcile Port assets lists and streamline annual asset updates to the City Comptroller.
- Review the Port's existing capital assets, and include assessment of the asset conditions, and infrastructure renewal budget, a maintenance and useful life schedule, and a coastal resilience framework appendix.
- Inform the development of a standard operating procedure to create a formalized workflow for the perpetual acquisition, recording, tracking, monitoring, maintenance, securing, reviewing, disposition, and physical inventory of Port assets. This procedure will likely include a preventative maintenance schedule for capital assets, as well as a maintenance verification form.

1.2.2 Relation to Port Milwaukee's Asset Management System

Port Milwaukee is working toward development of a comprehensive asset management system for coordinating and controlling maintenance and replacement activities on its assets and aligning those activities with the Port's goals and objectives. At the time of initial development of this capital asset renewal plan, a comprehensive asset management

system has not been established. Therefore, the CARP has been developed as a standalone plan, in the context of the Port's asset management tools existing at the time of initial plan development. The Port's existing asset management tools are described further in Section 1.3.3 of the plan. This plan includes a process of regular review and update envisioning its integration as a component to an overall asset management system developed at a future date. The Port's current asset management processes are separate from City of Milwaukee asset management systems and procedures and may remain so in the future.

1.2.3 Port Mission and Asset Renewal Objectives

A key aspect of asset management is to align renewal planning with organizational goals and objectives. Specifically, it is the *balancing of costs, opportunities, and risks against the desired performance of assets, to achieve the organizational objectives* (ISO 55000:2014(E), 2.4.1). For the purpose of informing this CARP, Port Milwaukee's goals and objectives related to asset renewal are presented through its Mission statement as stated below. Further asset renewal objectives established by Port Milwaukee are provided as well.

Port Mission and Vision:

- Strengthen the overall economic and social environment of the City of Milwaukee and the region by increasing international trade, business development, job creation, and public access to the waterfront.
- Continue to be a premier provider of domestic and international transportation and freight distribution services for commercial customers.
- Sustain Milwaukee as a water-centric city, where businesses thrive in a robust, Port-led maritime economy and where everyone can work, live and play through access to water-based commerce, recreation, and leisure.

Asset Renewal Objectives:

1. Position the Port for future growth.
2. Maintain assets in a state of good repair.

1.2.4 Stakeholders

The Port has many stakeholders with interest in long term planning for maintenance and replacement of Port assets. It is recognized by Port Milwaukee that engagement of stakeholders in the process of developing the capital asset renewal plan is key to realizing value in implementing the plan. Therefore, initial development and of the CARP and subsequent updates are to include stakeholder input. Organizational (internal) stakeholders include the Board of Harbor Commissioners and City of Milwaukee government. External stakeholders specific to the Port generally include the following:

- tenants,
- customers,
- community organizations,
- adjacent property owners,
- public recreational users, and
- state and federal government.

Stakeholder input was obtained as part of the asset renewal plan development. Details regarding stakeholder engagement is described in Section 1.3.2.

1.3 METHODOLOGY & APPROACH

This capital asset renewal plan was developed to align with fundamentals of asset management and asset management system as described by the International Organization for Standards (ISO) in their standards 55000/55001 which describes a risk-based asset management approach where the balancing of costs, opportunity, and risks are factored into asset management decisions. However, this capital asset renewal plan does not encompass all aspects of asset management envisioned by ISO. The primary elements of the ISO asset management system are described in Table 2 and include description of related components incorporated into this plan.

Table 2 - Comparison of CARP to ISO 55001 Standard for Asset Management Systems

ISO 55001 Asset Management System Element	Brief Description of ISO Asset Management System (AMS) Element	Related Components Incorporated in the Capital Asset Renewal Plan
Context of the Organization	Organization determines external and internal issues that are relevant to its purpose and those that affect its ability to achieve the intended outcomes of its AMS. Organization understands the needs and expectations of its stakeholders.	➢ Identification and alignment with Port mission and asset renewal planning objectives. ➢ Stakeholder engagement in plan development. ➢ Alignment of plan with City of Milwaukee Asset Management processes.
Leadership	Top management demonstrates leadership and commitment to the AMS, establishes asset management policy, and ensures responsibilities and authorities for relevant roles are assigned.	➢ Commitment to CARP development by Port leadership.
Planning	Organization takes action to address risks and opportunities and plan for achieving asset management objectives.	➢ A comprehensive risk-based decision framework has not been established for all Port assets. However, a level of risk is factored into asset renewal for water side assets through establishment of the Coastal Resiliency Framework prepared as a companion to this plan.
Support	Organization determines and provides resources necessary for establishment, implementation, maintenance, and continual improvement of the AMS. Organization determines competencies necessary for implementation of the AMS, provides awareness training, and plans for internal and external communications. Organization identifies information requirements to support its AMS and includes documented information including asset inventory, plans, procedures, and legal and regulatory requirements.	➢ The Capital Asset Renewal Plan provides documentation of information related to asset inventories, condition, and renewal planning for individual assets.
Operation	Organization plans, implements, and controls the AMS including outsourced activities. Implement management of change processes as they relate to risks associated with the AMS.	➢ No specific alignment with CARP identified.
Performance Evaluation	Organization monitors, measures, analyzes, and evaluates performance of its AMS, conducts internal audits, and provide management review at planned intervals.	➢ No specific alignment with CARP identified.

ISO 55001 Asset Management System Element	Brief Description of ISO Asset Management System (AMS) Element	Related Components Incorporated in the Capital Asset Renewal Plan
Improvement	Organization identifies non-conformity related to its AMS and implement corrective actions. A process of identifying potential failures in asset performance and conducting preventative action is performed. Organization should continually improve the suitability, adequacy, and effectiveness of its asset management and the asset management system.	➢ A process of regular review and update has been established in the CARP.

1.3.1 Coastal Management Framework

A Coastal Management Framework has been developed as a companion to this Capital Asset Renewal Plan. The purpose of this Coastal Management Framework is to identify the current and projected coastal processes affecting Port Milwaukee assets and provide a framework for long term strategic asset renewal planning and mitigating risks to vulnerable waterfront assets. The Coastal Management Framework is provided as Appendix A.

1.3.2 Stakeholder Engagement

Stakeholders were engaged in the CARP planning process through hosting stakeholder information meetings. Meetings were structured to provide stakeholders with an overview of the plan and development process and provide an opportunity to submit feedback. Two meetings were scheduled and hosted virtually on February 18 & 19, 2021. A list of stakeholder participants is provided in Appendix B.

1.3.3 Alignment with Port Asset Management Process

This plan has been developed to align with the following asset management process and tools existing at time of plan development.

- ***Asset Database***: Asset inventories and data managed in the Port Asset Database (PAD) were used to build inventories for this plan. The asset ID/name were used where available for consistency. The PAD does not contain a comprehensive list of all Port assets included in this plan. For this asset renewal plan, assets included were named and categorized in similar fashion as found in the asset database. The asset database was not updated as part of the process in preparing this plan. A separate, future process will be necessary to update the asset database to reflect assets and asset attributes covered in this plan.
- ***Maintenance Plans***: Some Port assets such as vehicles, vessels, cranes, compressors, and building systems, receive required routine maintenance which is planned in the Port's asset management process. These existing routine maintenance activities have largely been captured in the CARP however their inclusion is not exhaustive.
- ***City of Milwaukee Facility Development & Management (FDM) Facilities Condition Assessment Program (FCAP)***: A facilities condition assessment and capital improvement planning process was started by FDM for Port assets in 2012. That process was incomplete at the time of CARP development. However, this CARP was developed in a way that aligns with the FCAP method of budgeting maintenance and repairs across assets over time. This may aid in future expansion or development of the FCAP process into a component of Port Milwaukee's asset management system.

1.3.4 Organization of CARP

The CARP is organized to address Port assets in the 10 asset categories described in Table 1. Each section provides details related to the state of the infrastructure, level of service, and asset management strategies the methodology of which are detailed in Section 1.3.4.1, 1.3.4.2, and 1.3.4.3, respectively.

1.3.4.1 State of Infrastructure

The state of Port assets was determined for each asset category. The process involved the following primary steps:

- Identification of asset inventory to be included in the CARP,
- Evaluation of current asset condition and assigning a condition rating,
- Identification of repair and deferred maintenance needs, and
- Determination of current asset replacement costs.

Assets were inventoried for each of the 10 asset categories for inclusion into the CARP through review of the Port Asset Database and collaboration with Port staff. The set of assets included in the CARP are organized into the CARP Asset Inventory workbook. The specific Asset IDs used in the CARP Asset Inventory workbook are used throughout the plan for consistency and align with the asset descriptions used in the Port Asset Database.

The approach to evaluation of current asset conditions varies by asset category and is described in each section. Condition assessments were generally conducted using a combination of desktop study of existing asset data (age, materials of construction, repair history, etc.) and visual inspection. For each asset evaluated repairs and deferred maintenance needs were documented. In order to compare condition of assets within and across asset categories as well as provide measurable target for goals and defined level of service, assessed condition of assets are normalized into a five-point condition rating system from excellent to deficient (Figure 3) or a two-point rating as functional or nonfunctional (**Error! Reference source not found.**).

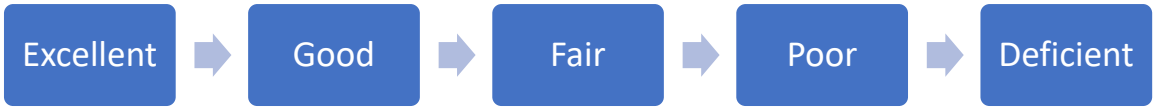

Figure 3 – Five-Point Asset Condition Rating System

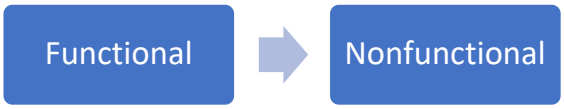

Figure 4 - Two-Point Asset Condition Rating System

A current replacement value (CRV) was estimated for each asset to provide a financial basis for comparing and evaluating costs of renewals. CRVs are prepared based on planning-level estimate and do not factor in depreciation. The CRV spreadsheet data is provided in the Asset Category Renewal Plans identified in Section 1.3.4.3.

1.3.4.2 Level of Service

Level of Service (LOS) is defined in ISO 55000 as the *parameters, or combination of parameters, which reflect social, political, environmental, and economic outcomes that the organization delivers. The parameters can include safety, customer satisfaction, quality, quantity, capacity, reliability, responsiveness, environmental acceptability, cost, and availability.* For the purpose of asset renewal planning identified in this plan, factors to be considered in establishing LOS targets for Port assets have been organized in 4 categories as described in Table 3.

Table 3 - Factors Considered for Establishing Level of Service

Factor	Consideration
Organizational Goals	Port Milwaukee's goals have a direct impact on the desired level of service provided by its assets. The Port's objectives related to asset renewal are translated to defining a level of service target for each asset category by maintaining assets in good state of repair. A condition rating based on a 5-point scale (deficient, poor, fair, good, excellent) is established to allow for comparison of asset condition to LOS and to other asset categories.
Stakeholder needs and expectations	Stakeholders include port tenants, community organizations, and the public. Each have needs and expectations of the level of service to be provided by Port assets.
Legislative / Regulatory Requirements	Legislative requirements include those ordinance or business plans required by City of Milwaukee. Regulatory requirements cover those legal requirements either by permit requirements, safety regulations, or building codes.
Financial Considerations	Financial considerations include constraints, budget, costs, etc.

1.3.4.3 Asset Renewal Strategies and Plan

For each asset category, high level renewal strategies are identified that support providing the desired level of service identified. Factors considered in establishing asset renewals strategies are described in Table 4. A target (or desired) level of service is identified for each of the asset categories evaluated based on the factors considered for establishing LOS.

Table 4 - Factors Considered in Establishing Asset Renewal Strategies

Factor	Consideration
Level of Service	What level of service does Port provide with its assets based on those factors considered as part of its renewal strategy?
Risk	What risks should be considered? How are they managed in Port asset renewals?
New Technologies	Are there new technologies that should be considered when planning asset replacements?
Growth	What future demands or increase in service levels will need to be addressed by Port assets?
Environmental Impact	Are there environmental impacts that should be considered in asset renewal strategies?

Rehabilitation and replacement projects are identified according to the strategies and mapped out through year 2070 (planning period). A workbook (*Asset Category Renewal Plan Workbook*) is created for each asset category where renewal activities are projected over the planning period. The Asset Category Renewal Plan Workbook includes the following worksheets:

- ***Summary***: Provides a rollup of renewal costs for assets in the category and includes a total. The Summary worksheet is referenced to the asset renewal plan worksheets and updates automatically. Changes to the summary table will only be required for structural changes in the asset renewal plan worksheet.
- ***Current Replacement Value (CRV)***: The current replacement value (2021) for each asset is estimated based on budget-level unit costs. The CRV is developed to provide a comparative value of the assets to the renewal costs.
- ***Asset Renewal Plan***: One or more asset plan worksheets are provided for each asset category based on their major sub-organizations. Each asset renewal plan follows a similar format that provides the following information:

Table 5 - Asset Renewal Plan Worksheet Guide

Column	Element	Description
B	Asset ID / Renewal Work	The asset description is provided in this field followed by details regarding the specific renewal work planned. Renewal work is intended to be detailed enough to provide a reasonable basis for the unit costs provided in Column E.
C-F	Capital Costs	Capital costs are developed on a unit cost basis. Unit costs are intended to be at a planning or budgetary level of detail and reflect present costs.
G	Total Renewal Cost Through 2070 (2021)	Total renewal cost is the sum of the renewals over the planning period including CRDM (Sum of Columns J-T). Since planned renewal costs are inflated by year, the total renewal costs reflect the present worth cost or the total amount relative to the value of the USD in 2021.The assume inflation rate is provided in cell K3 as a percent which is a referenced cell, adjustment of which will automatically update the spreadsheet.
H-I	Useful Life (UL) / Remaining Useful Life (RUL)	An estimate of useful life (UL) and remaining useful life (RUL) are provided for the assets or asset subsystems. For this plan, UL is defined as the estimated number of years the asset is likely to remain in service before it is obsolete, requires major repairs, or is no longer providing cost-effective service. The estimate of useful life is primarily based on professional judgment and industry standards. RUL is the estimated number of years remaining of the UL based on age, condition, exposure, and usage of the asset. Note that the estimated RUL is subjective and as a result can exceed the estimated UL. For instance, most steel sheet pile dock walls are given a UL of 100 years. However, the estimated RUL may exceed the UL when calculated from the date the wall was put in service.
J	Capital Repairs / Deferred Maintenance (CRDM)	Repairs and maintenance requirements that are needed or past due are placed in the CRDM category. These sometimes cover repairs to assets that are determined to be beyond their useful life.
K-T	5-Year Planning Bins for Renewal Costs	Identified renewal projects are placed out over the planning period based on remaining useful life or other renewal strategies. Capital costs are inflated at the rate referenced in cell K3. If a different inflation rate is desired, cell K3 can be updated with a new percentage and the changes will carry through the workbook. For renewal planning, 5-year planning bins are used to simplify the planning approach. As renewals approach the 5-10-year planning period, a detailed annual budget of renewal activities should be prepared in separate budgeting spreadsheet to aid in maintaining the streamlined approach of using 5-year planning bins.

2. BUILDINGS, TERMINALS, AND WAREHOUSES

STATE OF INFRASTRUCTURE

Inventory

Port Milwaukee has various maintenance and renewal responsibilities for building structures within its Buildings, Terminals, and Warehouses asset category. Building type and uses very from large warehouse facilities, commercial space, and office space. Some buildings are operated and maintained by Port tenants while others are occupied and maintained by Port. The delineation of maintenance responsibilities between Port and tenant are made in lease agreements which vary based on specific tenant and building. Some lease arrangements are structured as “bare ground” agreements whereby tenant erects building or uses existing buildings and are responsible for all renewals. Tenant erected structures may be required to be removed at the termination of the lease or transferred to Port where renewals may become Port responsibility at a future date. At the time of plan development there are 17 building structures for which Port has renewal responsibilities and 12 structures associated with bare ground lease arrangements. A summary of the buildings and current renewal responsibilities are summarized in Table 6.

Table 6 - Port Building Renewal Responsibility

Lease Buildings with Shared Renewal Responsibilities	Non-Leased Buildings with Full Renewal Responsibility	Bare Ground Lease Buildings with No Current Renewal Responsibilities
TERMINAL #2 BUILDING	POLE BUILDING #1	ST. MARY'S WAREHOUSE BUILDING
TERMINAL #3 BUILDING	POLE BUILDING #2	ST. MARY'S PROCESSING BUILDING
TERMINAL #3A BUILDING	PORT ADMINISTRATION BUILDING	ST. MARY'S OFFICE BUILDING
TERMINAL #4 BUILDING	SEAMAN'S CLUB BUILDING	LAFARGE MAINTENANCE BUILDING
TERMINAL #4A BUILDING		LAFARGE RAIL LOADING BUILDING
TERMINAL #5 BUILDING		CARGILL WAREHOUSE BUILDING
BRADFORD #1 BUILDING		US OIL OFFICE BUILDING
BRADFORD #2 BUILDING		US OIL MAINTENANCE BUILDING
LAKE EXPRESS BUILDING		US OIL MECHANICAL BUILDING
MILWAUKEE BULK TERMINALS BUILDING		SOUTH HARBOR OFFICE BUILDING
COMPASS MINERALS OFFICE BUILDING		SOUTH HARBOR CANOPY STRUCTURE
PORTLAND TRUCKING BUILDING		SOUTH HARBOR MECHANICAL BUILDING
SEA SCOUTS BUILDINGS		

Current Replacement Value

Current replacement value of the 17 buildings is estimated to total $53,496,000. A summary chart indicating the replacement values is provided below. The Port’s two large terminal buildings (#3 and #4) represent nearly 40% of the asset category value.

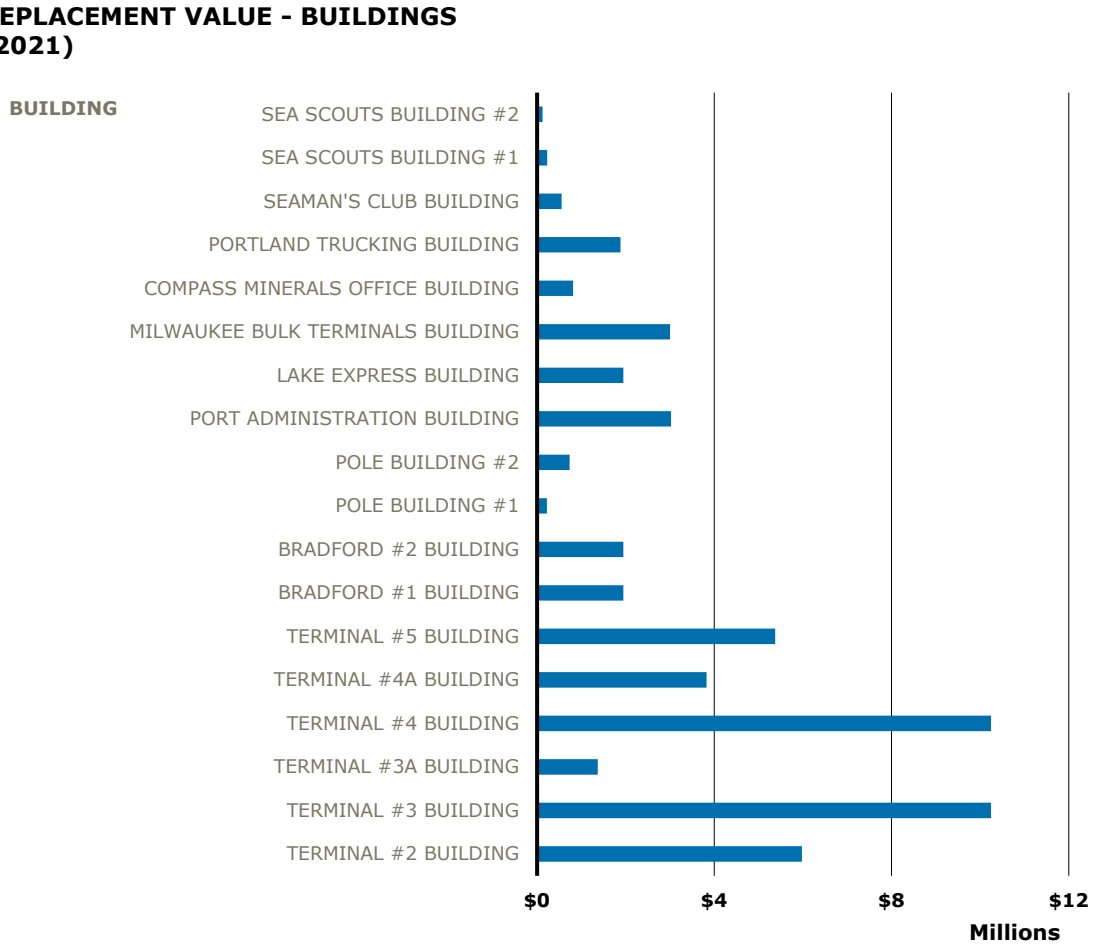

Figure 5 - Building CRV Summary

Condition Assessment

Building condition assessment were completed by visual inspection, review of existing building plans and records, and discussion with port and tenant representatives. An inspection record is completed for each building that covers major building systems including its exterior, interior, mechanical, electrical, and plumbing (MEP), safety, and site. Condition of building systems are then rated based on remaining useful life.

An industry recognized method for comparing the relative condition of a group of facilities overt time uses the calculated Facility Condition Index (FCI). The FCI is the sum of the maintenance, repairs, and replacement costs (renewals) of a facility divided by its current replacement value. Renewal costs used in calculating the FCI cover a given period of time.

$$Facility\ Condition\ Index = \frac{Renewal\ Costs}{Current\ Replacement\ Value}$$

For evaluating condition of Port facilities, an FCI covering a 5-year period is used which aligns with that asset renewal plan worksheets that are structured around 5-year planning bins. A standard is not established for FCI however based on a reasonably accepted approach that considers facilities with and FCI of less than 0.05 as being in good condition, the following condition rating (Table 7) is established for Port buildings based on the 5-point scale developed for all port asset categories.

Table 7 - Building Asset Condition Rating

Condition Rating	Excellent	Good	Fair	Poor	Deficient
Facility Condition Index (FCI)	<0.05	0.05-0.10	0.10-0.15	0.15-0.20	>0.20

Current Condition

Table 8 provides a summary of building condition using the FCI condition rating. FCI was calculated from the sum of the capital repairs and deferred maintenance (CRDM) added to the renewal costs projected through 2025. An average FCI and rating are provided as well.

Table 8 - Building Current Condition Summary

Asset ID	Replacement Value (2021)	CRDM + Renewal Through 2025	FCI	Condition Rating
TERMINAL #2 BUILDING	$5,978,468	$373,000	0.06	Good
TERMINAL #3 BUILDING	$10,246,500	$932,000	0.09	Good
TERMINAL #3A BUILDING	$1,372,000	$0	0.00	Excellent
TERMINAL #4 BUILDING	$10,246,500	$18,000	0.00	Excellent
TERMINAL #4A BUILDING	$3,828,000	$23,000	0.01	Fair/Good
TERMINAL #5 BUILDING	$5,376,000	$336,000	0.06	Good
BRADFORD #1 BUILDING	$1,950,000	$139,000	0.07	Good
BRADFORD #2 BUILDING	$1,950,000	$139,000	0.07	Good
POLE BUILDING #1	$224,000	$38,000	0.17	Poor
POLE BUILDING #2	$735,000	$0	0.00	Excellent
PORT ADMINISTRATION BUILDING	$3,024,000	$4,000	0.00	Excellent
LAKE EXPRESS BUILDING	$1,950,000	$0	0.00	Excellent
MILWAUKEE BULK TERMINALS BUILDING	$3,004,400	$81,400	0.03	Excellent
COMPASS MINERALS OFFICE BUILDING	$815,000	$167,000	0.20	Poor
PORTLAND TRUCKING BUILDING	$1,886,000	$989,925	0.52	Deficient
SEAMAN'S CLUB BUILDING	$554,200	$136,124	0.25	Deficient
SEA SCOUTS BUILDING #1	$230,000	$23,580	0.10	Fair/Good
SEA SCOUTS BUILDING #2	$126,000	$45,500	0.36	Deficient
TOTAL / AVERAGE	**$53,496,068**	**$3,445,529**	**0.11**	**Fair**

Based on the average FCI Port buildings are currently found to be in fair condition with several Port building assets considered in good condition or better representing over 90% of the total building replacement value.

The FCI does not entirely tell the story of the building condition in a few cases. Brief observations regarding the condition rating for a few of the buildings is provided here:

- Buildings with shared maintenance responsibilities such as Milwaukee Bulk Terminals Building, do not have all the cost accounted for in the renewal plan and therefore skew the FCI toward a better condition rating.
- Terminal Building #4A: This steel framed, metal-sided building is being used by tenant for processing of salt products. The corrosive environment caused by the salt and operations has led to a sever corrosion to the building. All repairs and maintenance to rectify the current condition of the building are not accounted for in the renewal plan, skewing the FCI condition rating to fair/good. The actual building condition is very poor for the reasons mentioned.

Assumptions

- Estimates of remaining useful life (RUL) made for building systems assumes Port is tracking and performing customary maintenance on building systems to ensure full life cycle of assets is achieved.
- Some major renewals for mechanical, plumbing, and electrical building systems have not been captured in the condition assessments and the renewal plan for these building components will need to be developed and included in subsequent plan updates.

LEVEL OF SERVICE

Table 9 - Level of Service Factors for Building Assets

LOS Factor	Performance Indicator, Target, and Other Considerations
Organizational Goals	To align with Port asset renewal objective of maintaining assets in state of good repair, a LOS target for building assets is established to maintain an average 5-year FCI of 0.10 or less.
Stakeholder expectations and considerations	Maintain building assets to meet tenant expectation for reliable and safe for performance. Maintain buildings in a state of good repair and fit for occupancy.
Legislative / Regulatory Requirements	Several legislative and regulatory requirements will mandate level of service for building assets including federal, state, and local building codes, OSHA, ADA, fire protection and safety systems.
Economic Considerations	Port expenditures on renewals for leased buildings is balanced with shared maintenance responsibilities between Port and its tenants based on individual lease agreements.

RENEWAL STRATEGIES & PLAN

Considerations of factors influencing renewal strategies for building assets is provided in Table 10.

Table 10 - General Renewal Strategy Considerations for Building Assets

Renewal Strategy Factor	Considerations
Level of Service	Maintaining 5-year FCI at 0.10 or less will ensure organizational goals and stakeholder expectations are met.
Risks	Determine coastal risks associated with high lake levels and flood risks and plan for mitigating renewals. Allow for buildings with excellent condition ratings to have maintenance and repairs deferred while still maintaining targeted level of service. Continue mitigating project funding risks through proactive grant application and seeking new funding opportunities.
New Technologies	Plan for electric vehicle technologies and the inclusion of charging station infrastructure at Port facilities such as the Port Administration Building. Continue to explore new building technologies around energy efficiency and/or alternative energy.
Growth	Align building replacements with growth plans and projections.
Environmental Impacts	Meet or exceed environmental requirements for redevelopment projects. Incorporate existing building technologies around energy efficiency and/or alternative energy.

Asset Renewal Plan

For the building asset category, the Asset Renewal Plan Workbook is organized by building. A worksheet is provided for each building that separates renewals by major building system (exterior, interior, MEP, Safety, and Site). A building-specific renewal summary is provided as Table 11.

Table 11 - Building Specific Renewal Summary

Building Asset	Renewal Summary
TERMINAL #2 BUILDING	Entire building system to be included in renewal plan. Major renewals include roofing, siding, corrosion protection of steel members, and rail dock rehabilitation.
TERMINAL #3 BUILDING	Entire building system to be included in renewal plan. Major renewals include roofing, windows, and corrosion protection of steel members.
TERMINAL #3A BUILDING	Former refrigeration building. Shows signs of age but is functioning well for use as mechanical garage. Major renewals include rehabilitation of corroded structural members and corrosion protection.
TERMINAL #4 BUILDING	Entire building system to be included in renewal plan. Major renewals include roofing, windows, corrosion protection of steel members, and steel column footing rehabilitation.
TERMINAL #4A BUILDING	Building is likely beyond suitability for other warehouse uses. No specific renewal plan identified.
TERMINAL #5 BUILDING	Entire building system to be included in renewal plan. Major renewals include roofing, siding, and asphalt floor replacement.
BRADFORD #1 BUILDING	Entire building system to be included in renewal plan. Major renewals include door replacement, siding, and roofing.
BRADFORD #2 BUILDING	Entire building system to be included in renewal plan. Major renewals include door replacement, siding, and roofing.
POLE BUILDING #1	Sheet metal siding and roof are aged. Plan for roof replacement.
POLE BUILDING #2	New building. Potential heating project.
PORT ADMINISTRATION BUILDING	Plan for major renewals of roof, windows, siding, general interior renovations, etc.
LAKE EXPRESS BUILDING	Plan for major renewals of roof, windows, siding, etc. Consider adding permanent maintenance storage and refrigeration unit. Address settlement issues in site walkways.
MILWAUKEE BULK TERMINALS BUILDING	Plan for major renewals of interior paved floor, window replacement, and exterior brick repair.
COMPASS MINERALS OFFICE BUILDING	Interior and site elements in fair condition. Renewal plan to include replacement or rehabilitation of exterior systems, including roof, brick, and windows.
PORTLAND TRUCKING BUILDING	Interior and site elements in fair condition. Tenant indicates planned renovations for interior and site, including paving. Renewal plan to include replacement or rehabilitation of exterior systems, including roof, brick, and windows. Also include pavement replacement.
SEAMAN'S CLUB BUILDING	Significant renovations required to place back into service as office space. Renewal plan to include roof replacement and securing window openings.
SEA SCOUTS BUILDINGS	Plan for new roof and windows.

Assumptions

Assumptions for building renewal strategies include:

- Building use will not change significantly from current or past use of buildings.

3. DOCKWALLS

STATE OF INFRASTRUCTURE

Inventory

The port's waterfront infrastructure can be considered the backbone of its operation, the working line between its waterborne and land-based transportation services. The dockwall asset category contains all waterfront infrastructure types within the ports area of responsibility which primarily includes steel sheet pile bulkheads, stone revetments, piers, and docks. The port's dockwall inventory is delineated into 33 segments of similar construction and use and are divided into three areas: North Harbor Tract, South Harbor Tract – West, and South Harbor Tract – East.

Current Replacement Value

Current replacement value of Port's dockwall assets are estimated to total $77,030,000. A summary chart indicating the replacement values by dockwall segment is provided below.

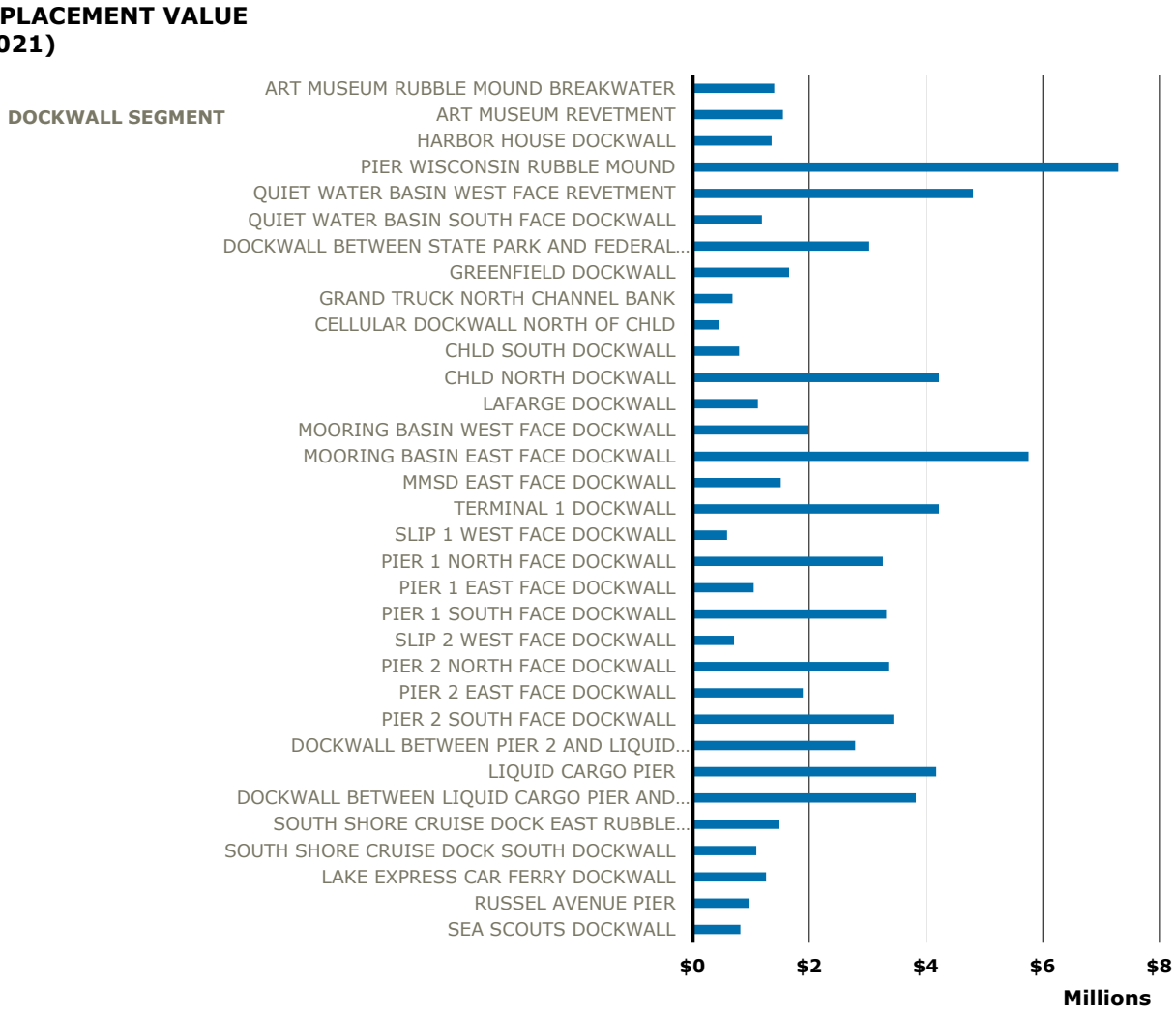

Figure 6 - Dockwall CRV Summary

Condition Assessment

Dockwall assets were inspected using a combination of field observation and high-resolution drone imagery captured at an oblique angle to the dockwall. All inspection were conducted above the water line and results of inspections were documented in an inspection report for each segment. Port construction drawings and inspection records were utilized to determine form, materials, and age of the entire dockwall structure. Dockwall condition assessment followed guidelines provided in the Waterfront Facilities Inspection and Assessment Manual published by the American Society of Civil Engineers (ASCE).

A condition rating based on remaining useful life (RUL) has been established for dockwalls as shown in Table 12.

Table 12 - Dockwall Asset Condition Rating

Condition Rating	Excellent	Good	Fair	Poor	Deficient
Remaining Useful Life (RUL)	>60	20-60	10-20	<10	Beyond Useful Life

Current Condition

Freshwater dockwall assets of steel and concrete typically have a useful life of over 100 years. Port Milwaukee dockwalls are no exception with some dockwalls built in the 1930s still in service today and in good condition. The freshwater environment of Lake Michigan they sit in is much less corrosive than seawater environments where the same steel structures would have half the life. However, some impacts to steel dockwalls from bulk salt use at the port were observed where salt laden runoff appeared to be accelerating corrosion of piles in areas.

A summary of the dockwall condition by length and asset type is provided in Table 13.

Table 13 - Dockwall Current Condition Summary by Length (feet)

Condition Rating	Excellent >60 years RUL	Good 20-60 years RUL	Fair 10-20 years RUL	Poor <10 years RUL	Deficient Beyond Useful Life
North Harbor Tract					
Revetment or Rubble Mound	1,542	2,398	0	0	0
SSP Bulkhead, Dockwall or Pier	0	2,046	0	0	0
South Harbor Tract – East					
Cellular SSP Dockwall	0	1,151	0	0	0
Pile Supported Deck Pier	0	1,054	0	0	0
Revetment or Rubble Mound	0	369	0	0	0
SSP Bulkhead, Dockwall or Pier	0	6,265	5,517	0	0
South Harbor Tract – West					
Cellular SSP Dockwall	0	444	0	0	0
Revetment or Rubble Mound	0	0	0	0	684
SSP Bulkhead, Dockwall or Pier	0	4,263	2,878	0	0
Total	1,542	17,991	8,395	0	684

Note:
Asset lengths in linear feet.

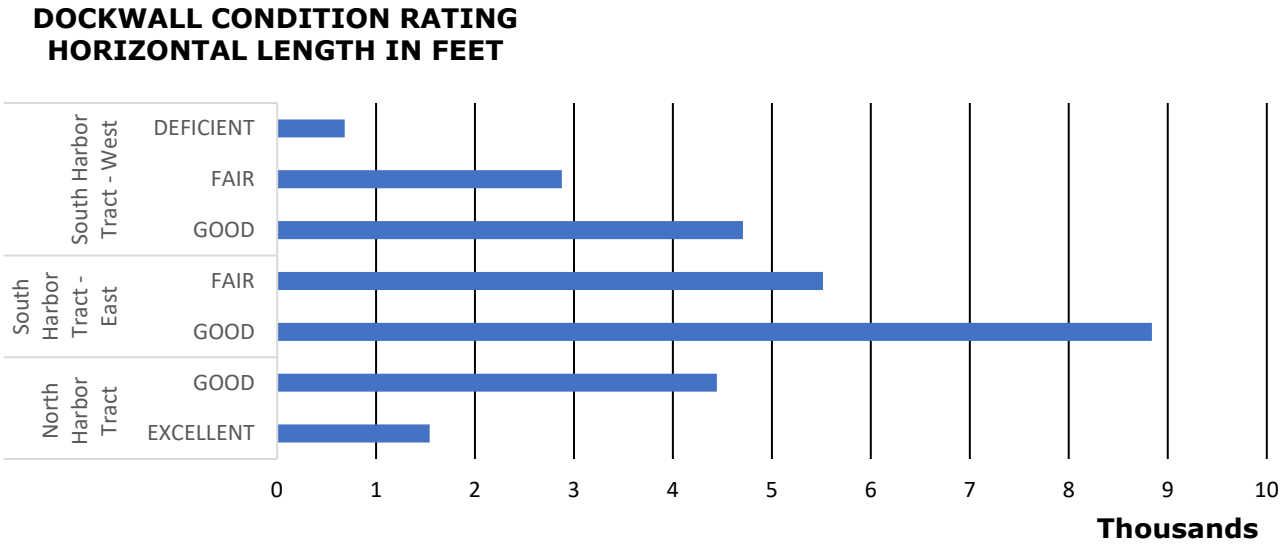

Figure 7 - Dockwall Current Condition Summary

Assumptions

- Remaining useful life estimated based on age of asset and estimated useful life of asset material. Useful life estimated to be 100 years for all materials, except for the pile supported deck pier, which was estimated to be 75 years.

LEVEL OF SERVICE

Table 14 - Level of Service Factors for Dockwall Assets

LOS Factor	Performance Indicator, Target, and Other Considerations
Organizational Goals	To align with Port asset renewal objective of maintaining assets in state of good repair, the LOS target for dockwall assets is to maintain a RUL of 20 years or more.
Stakeholder expectations and considerations	Maintain dockwalls to meet tenant expectation for reliable and safe performance. Maintain dockwalls to meet public expectations for reliable and safe access.
Legislative / Regulatory Requirements	Milwaukee City Code of Ordinances US Coast Guard
Economic Considerations	Limits of available finances for dockwall replacement and maintenance require careful planning and phased approach for major replacement and renewal efforts. LOS is limited to access to state and federal grant and annual capital budget.

RENEWAL STRATEGIES & PLAN

Table 15 - General Renewal Strategy Considerations for Dockwall Assets

Renewal Strategy Factor	Considerations
Level of Service	Maintaining dockwall assets according to targeted level of service based on remaining useful life will ensure stakeholder LOS expectations are met.

Renewal Strategy Factor	Considerations
Risks	Evaluate coastal risks associated with high lake levels and flood risks and plan for mitigation when renewing dockwall assets. Deterioration rates and RUL uncertainty present risk for failure of dockwall prior to planned replacement perform detailed assessment that include underwater inspection and testing to improve RUL prediction. Identify and manage risks related to salt exposure on dockwalls and excessive corrosion.
New Technologies	Consider operational changes to reduce accelerated deterioration Consider new materials for sheet pile walls (i.e., vinyl, composite, fiberglass)
Growth	No Current dockwall renewals are planned to accommodate projected growth or expansion of port services. Consider growth needs when replacing dockwalls. Renewals relative to dockwalls near the pending DMMF should be deferred.
Environmental Impacts	None identified

Asset Renewal Plan

For the dockwall asset category, the Asset Renewal Plan Workbook is organized by dockwall segment. A separate worksheet is provided for the North Harbor Tract, South Harbor Tract-East, and South Harbor Tract-West that contain the dockwall segments located in those areas. A dockwall-specific renewal summary is provided below in Table 16. Total renewal costs estimated for dockwalls through 2070 is about $9.77M.

Table 16 - Dockwall Segment Specific Renewal Summary

Dockwall Asset	Renewal Summary
SEA SCOUTS DOCKWALL	Monitor wall and anchorages. Monitor future dockside uses to restrict surcharges. Replace with dockwall of similar design draft depth at end of useful life.
RUSSEL AVENUE PIER	Monitor pier fill and deck for loss of material. Plan for deck rehab project in next 5-years to ensure public use is maintained until structure is replaced. Some point repairs to SSP and anchorages may be required. Replace with pier of similar geometry and use. Upgrade public safety features such as railing and ladders.
LAKE EXPRESS CAR FERRY DOCKWALL	The cellular SSP wall system is roughly halfway through its useful life. Some localized reinforcement or rehabilitation of the cellular SSP system may be required to maximize RUL.
SOUTH SHORE CRUISE DOCK SOUTH DOCKWALL	The cellular SSP wall system is roughly halfway through its useful life. Some localized reinforcement or rehabilitation of the cellular SSP system may be required to maximize RUL. The concrete dockwall segment should either be rehabilitated if commercial docking is to continue or removed/modified to accommodate other uses. Fender repairs are recommended.
SOUTH SHORE CRUISE DOCK EAST RUBBLE MOUND DIKE	Overall, structure is functional and can be considered about halfway through its useful life before major rehabilitation of the system and supplementing the stone with new will be required.
DOCKWALL BETWEEN LIQUID CARGO PIER AND CDF	Replace broken safety ladders. Monitor other safety ladders and replace when required. Monitor the SSP checking for deformations and defects, with aim to replace at end of RUL. Consider replacement with SSP bulkhead of shorter wall height if wall will not serve as docking wall. A portion of this dockwall may need to be replaced due to planned expansion of the CDF.
LIQUID CARGO PIER	[Renewal plan for segment not complete]
DOCKWALL BETWEEN PIER 2 AND LIQUID CARGO PIER	Monitor safety ladders and replace when required. Monitor the SSP checking for deformations and defects, with aim to replace at end of RUL. Consider replacement with SSP bulkhead of shorter wall height if wall will not serve as docking wall.
PIER 2 SOUTH FACE DOCKWALL	Perform detailed evaluation of Pier 2 SSP RUL by 2030 to refine timing for planned replacement. Dockwall is designed for 39 ft wall height. Ability to add additional 1-2 ft. of dredge depth without reinforcement or rehab is likely feasible - will require additional engineering evaluation to determine. Fender system may need to be replaced before dockwall.

Dockwall Asset	Renewal Summary
PIER 2 EAST FACE DOCKWALL	Same renewal approach as Pier 2 North/South Face Dockwalls. East face is outfitted with rubber fender and steel/concrete pile cap/curb assembly. Continued use of east face for docking should be evaluated which will factor into replacement of the east dockwall and fenders.
PIER 2 NORTH FACE DOCKWALL	Same renewal approach as Pier 2 South Face Dockwall.
SLIP 2 WEST FACE DOCKWALL	Plan for replacement at end of useful life. A replacement wall may be able to be shorter and less costly if planned operations at the end of the slip facilitate it. Considerations for enhancing or expanding wave protection should be incorporated into the wall replacement.
PIER 1 SOUTH FACE DOCKWALL	Same renewal approach as Pier 1 North Face Dockwall.
PIER 1 EAST FACE DOCKWALL	Same renewal approach as Pier 1 North/South Face Dockwalls. Use of east face for docking should be evaluated which will factor into replacement of the east dockwall and fenders.
PIER 1 NORTH FACE DOCKWALL	Perform detailed evaluation of Pier 1 SSP RUL by 2030 to refine timing for planned replacement. Dockwall is designed for 36 ft wall height. Ability to add additional 1-2 ft. of dredge depth without reinforcement or rehab is likely not feasible without reinforcing - will require additional engineering evaluation to determine. Look to hold out on replacement of fenders with dockwall replacement.
SLIP 1 WEST FACE DOCKWALL	Plan for replacement at end of useful life. A replacement wall may be able to be shorter and less costly if planned operations at the end of the slip facilitate it. Considerations for enhancing or expanding wave protection should be incorporated into the wall replacement.
TERMINAL 1 DOCKWALL	Begin long-term process for planning replacing 1930s SSP dockwalls starting with the segment along Terminal 1. Replacement options can consider placement of new anchor wall forward of existing.
MMSD EAST FACE DOCKWALL	[Renewal plan for segment not complete]
MOORING BASIN EAST FACE DOCKWALL	[Renewal plan for segment not complete]
MOORING BASIN WEST FACE DOCKWALL	Monitor the SSP checking for deformations and defects, with aim to replace at end of RUL. Plan for upgrade of fender system that will need to be salvaged and reinstalled with new SSP dockwall.
LAFARGE DOCKWALL	[Renewal plan for segment not complete]
CHLD SOUTH DOCKWALL / SMALL BOAT SLIP SEGMENT	Monitor the SSP checking for deformations and defects, with aim to replace at end of RUL. Consider closing off and filling slip if no long-term use planned.
CHLD SOUTH DOCKWALL / 264 FT SEGMENT NORTH OF SMALL BOAT SLIP	Monitor the SSP checking for deformations and defects, with aim to replace at end of RUL. Future replacements/rehabs should consider increasing height of wall and top of wall elevations.
CHLD NORTH DOCKWALL / 1,193 FT PRIMARY SEGMENT OF CHLD	Monitor the SSP checking for deformations and defects, with aim to replace at end of RUL. Future replacements/rehabs should consider increasing height of wall and top of wall elevations.
CHLD NORTH DOCKWALL / 215 FT SEGMENT AT NORTH END OF CHLD	Monitor the SSP checking for deformations and defects, with aim to replace at end of RUL. Future replacements/rehabs should consider increasing height of wall and top of wall elevations.
CELLULAR DOCKWALL NORTH OF CHLD	[Renewal plan for segment not complete]
GRAND TRUCK NORTH CHANNEL BANK	[Renewal plan for segment not complete]
GREENFIELD DOCKWALL	[Renewal plan for segment not complete]
DOCKWALL BETWEEN STATE PARK AND FEDERAL PIER	Monitor the SSP checking for deformations and defects, with aim to replace at end of RUL. Consider replacement with SSP bulkhead of shorter wall height if wall will not serve as docking wall. Tube steel railing will likely need to be rehabilitated before end of dockwall RUL.
QUIET WATER BASIN SOUTH FACE DOCKWALL	Monitor the SSP checking for deformations and defects, with aim to replace at end of RUL. Consider replacement with SSP bulkhead of shorter wall height if wall will not serve as docking wall. Reinforced concrete cap can likely make it to

Dockwall Asset	Renewal Summary
	dockwall full replacement provided it is adequately maintained (grouted/sealed).
QUIET WATER BASIN WEST FACE REVETMENT	Limestone is weathered but has sufficient lifespan remaining to be reworked for rehabilitation of revetement in the future when needed. Since the shoreline is protected within the quiet water basin, the stone size and gradation required for protection can likely be served through reworking the existing stone with minor supplementation for the filter layer (geotextile or aggregate). The renewal approach should include reworking the revetment section in segments as needed.
PIER WISCONSIN RUBBLE MOUND	Due to current age and condition of Pier Wisconsin, major renewals for concrete, stone, and steel components have not been planned through year 2070. Replacement of rubber fenders at end of useful life is planned. Rehabilitation of the concrete roadway, curbs, and steel catwalks should be monitored and included in the renewal plan worksheet in later updates when deterioration rates of these components become more apparent.
HARBOR HOUSE DOCKWALL	Monitor the SSP checking for deformations and defects, with aim to replace at end of RUL. Consider replacement with SSP bulkhead of shorter wall height if wall will continue non-docking service. Tube steel railing will likely need to be rehabilitated before end of dockwall RUL.
ART MUSEUM REVETMENT	Monitor configuration of stone revetment and rework/supplement as necessary to provide protection from direct wave action under the walkway. Eastern edge of walkway has corrosion staining, spawling, and cracking indicating potential exposure of the rebar. A preventative maintenance project is recommended to repair and protect the eastern edge of the concrete from continued deterioration.
ART MUSEUM RUBBLE MOUND BREAKWATER	No major renewal activities planned for next 50-year period due to the current age and nature of the structure.

Assumptions

- Most dockwall renewals planned assumed full replacement of dockwall asset at or near end of useful life. Some dockwalls may benefit from major rehabilitation at end of useful life to extend its service cost effectively. Assuming full replacement of a dockwall ensures the high-end planning-level costs are identified. It is assumed that Port will evaluate major renewal requirements for dockwalls as they near end of useful life to determine feasibility and cost-benefit of rehabbing a structure over replacement.

4. NAVIGATIONAL AREAS

STATE OF INFRASTRUCTURE

Inventory

The navigational areas asset category includes areas outside of the federally maintained channel that require minimum water depths to allow for vessel navigation and access within Port Milwaukee. The US Army Corps of Engineers maintains depths of the Milwaukee harbor and channel. Port Milwaukee maintains its berth facilities to -27 ft (IGLD 85) which is the depth maintained for the St. Lawrence Seaway and Great Lakes Navigation system. Other areas within Port Milwaukee are maintained to -17 ft (IGLD 85).

The areas identified as navigational area assets maintained to -27 ft (IGLD 85) include:

- Slip 1
- Slip 2
- Slip 3
- Liquid Cargo Pier
- City Heavy Lift Dock
- Municipal Mooring Basin
- Greenfield Dock

The areas identified as navigational area assets maintained to -17 ft (IGLD 85) include:

- Pier Wisconsin
- Maritime Basin & Entrance
- South Shore Cruise Dock / Lake Express Car Ferry Dock
- Grand Trunk Slip

Current Replacement Value

Due to the limited availability of historical dredging data within Port Milwaukee, a current replacement value was not developed for navigational areas. A CRV could be developed in the future based on historic dredging frequency and volume or a modeled rate of sedimentation over the planning period.

Condition Assessment

Recent bathymetric data for the navigational areas, and detailed dredging history for the Port were unavailable for review at the time of this condition assessment. Limited historic dredging data and interviews with Port staff indicate that Port draft areas have historically required little maintenance dredging and are currently operational. A two-level condition rating system was utilized for this assessment to identify navigational assets as Functional or Nonfunctional in meeting their required LOS. For example, navigational areas with top of sediment elevations above minimum draft requirements would be considered Nonfunctional. A more detailed rating system could be developed in the future based on top of sediment elevation relative to target draft depths if routine bathymetric surveys were conducted.

Current Condition

Regular dredging of Port berths is not required. Sedimentation rates are low due, in part, to the sediment transport protection provided by the federal breakwater and the regular dredging by USACE in the federal harbor and channel that reduce feed material that would otherwise be available for settlement in Port berth facilities. Port staff indicate that all navigational areas are currently operational. Therefore, current condition ratings for navigational areas are all considered to be functional.

LEVEL OF SERVICE

Table 17 - Level of Service Factors for Navigational Area Assets

LOS Factor	Performance Indicator, Target, and Other Considerations
Organizational Goals	Maintain berth areas in good, functional condition. Commercial berthing areas dredged to Seaway depth with current (less than 5 years old) soundings for all berthing locations. Maintain target depths in navigational areas across 100% of area.
Stakeholder expectations and considerations	Maintain current dredge depths (e.g., 27 feet for Seaway max) Provide drafts for projected low lake levels.
Legislative / Regulatory Requirements	None identified.
Economic Considerations	None identified.

RENEWAL STRATEGIES & PLAN

Table 18 - General Renewal Strategy Considerations for Navigational Area Assets

Renewal Strategy Factor	Considerations
Level of Service	Maintain level of service. Consider system approach with dockwalls (dockwalls may need to be modified or changed during replacement to accommodate change in level of service.) Providing LOS based on projected use. Implement routine hydrographic survey program for navigational areas to define conditions and achieve targeted level of service.

Renewal Strategy Factor	Considerations
Risks	Evaluate coastal risks associated with low lake levels and plan for mitigating renewals.
New Technologies	None identified.
Growth	No specific growth-related renewal strategies associated with navigational areas are identified.
Environmental Impacts	Incorporate plans for beneficial reuse of dredged material when maintaining navigational areas.

Asset Renewal Plan

An asset renewal plan workbook was created for navigational areas, however there is not enough data available to provide a cost forecast at this time. Renewal costs would consist of periodic maintenance dredging and sediment disposal. Current bathymetric data for navigational areas, detailed historic dredging records and/or sedimentation rate modeling would be needed to provide accurate planning for navigational area assets. The Port is currently planning to establish a routine hydrographic survey program and dredging record keeping to improve dredge planning.

5. FENCING

STATE OF INFRASTRUCTURE

Inventory

The fencing asset category includes perimeter and security fencing and gates, on the South Harbor Tract. Fencing was inventoried along roadways and surrounding Port parcels. Most of the fencing is 6 or 8-foot-high chain link security fencing with barbed wire on top. Decorative steel picket security fence was identified at the Lake Express Terminal, CDF fence line, and the Port Administration Building. In total, the inventory includes about 44,950 lineal feet of fence.

Current Replacement Value

Current replacement value of Port's fencing assets is estimated to total $2,623,000.

Condition Assessment

Fencing condition assessment was completed by visual inspection. All sections of fencing and gates were visually inspected for damage and functionality. The extent of corrosion and vegetation on fencing was also noted. A condition rating based on remaining useful life (RUL) has been established for fencing as represented in Table 19 below.

Table 19 - Fencing Asset Condition Rating

Condition Rating	Excellent	Good	Fair	Poor	Deficient
Remaining Useful Life (RUL)	>20	10-20	3-10	<3	Beyond Useful Life

Current Condition

Overall, the steel picket fencing is in good to excellent condition. The chain link fencing is serviceable, with most of it in fair too good condition, however some sections deficient and beyond its useful life.

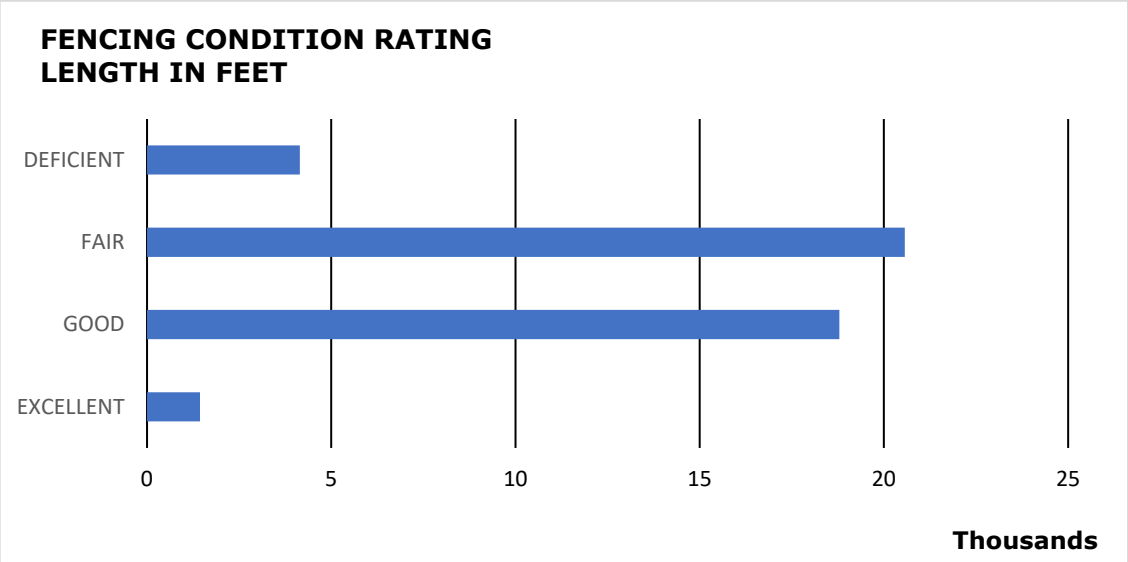

Figure 8 - Fencing Current Condition Summary by Length

Assumptions

- Remaining useful life is estimated based on the current condition of the asset.
- Assets with no signs of wear or damaged were assumed to have a maximum useful life of 25 years.
- Repairs and renewals were not considered to significantly extend useful life.

LEVEL OF SERVICE

Table 20 - Level of Service Factors for Fencing Assets

LOS Factor	Performance Indicator, Target, and Other Considerations
Organizational Goals	Maintain fence in good condition as measured by estimated remaining useful life. Provide boundary definition of Port areas through perimeter fencing. Provide physical deterrent to unauthorized entry into secured areas. Security fences and gates are installed and used primarily to define the perimeter of protected areas, restricted areas, controlled areas, entry control/access control points, installation perimeters, and to define parcel boundaries. Fencing should provide a physical and psychological deterrent to entry and preventing unauthorized personnel from entering a protected area.
Stakeholder expectations and considerations	Port provides and maintains functional perimeter security through construction and maintenance of fencing. Fencing egress points are reliable and easy to use.
Legislative / Regulatory Requirements	Homeland security, U.S. Customs Foreign Trade Zone
Economic Considerations	None identified.

RENEWAL STRATEGIES & PLAN

Table 21 - General Renewal Strategy Considerations for Fencing Assets

Renewal Strategy Factor	Considerations
Level of Service	Maintain or improve level of service Establish fencing standard to ensure continued unification in type. Evaluate inclusion of gate automation into renewals
Risks	Some fencing segments do not have well defined function while most may be considered critical assets. A method for prioritizing important fence segments based on function would be beneficial to renewal planning.
New Technologies	None identified.
Growth	Expansion of secured port areas should be considered during fencing renewals.
Environmental Impact	No renewal strategies are identified that consider environmental impacts of fencing.

Asset Renewal Plan

An asset renewal plan workbook is developed for fencing and is organized by segment. Renewals for gates are included in the associated fence segment and primarily assume an in-kind replacement. The primary renewal strategy capture in the plan is full replacement at end of estimated useful life. Reuse of fencing components like posts and gates during replacements is not considered in the renewal plan. Total renewal costs estimated for fencing through 2070 is about $9.77M.

Assumptions

- Current fencing types and locations assumed to meet the current regulatory requirements and tenant needs.

6. GREEN INFRASTRUCTURE AND PUBLIC SPACES

STATE OF INFRASTRUCTURE

Inventory

Port assets in the green infrastructure and public spaces category include a stormwater management facility and public waterfront access spaces as follows:

- North Urban Park (North Harbor Tract)
- Public Waterfront
    - Russell Avenue Pier and Walkway*
    - Park space adjacent to Lake Express
    - Pier Wisconsin (North Harbor Tract)*
    - Area adjacent to dockwalls between CDF and Liquid Cargo Pier*
- Stormwater Pond (Parcel C)
- Grand Trunk Wetlands

*Maintenance costs included in Dockwalls and Pavement asset categories.

Kaszube's Park is maintained by the City of Milwaukee and is not considered an asset of the Port. The Grand Trunk Wetlands area is managed in coordination with the Department of Community Development (DCD). Public spaces along dockwalls with no other significant infrastructure are included in the Dockwall and Pavement asset categories. This includes the Russell Avenue pier and walkway, Pier Wisconsin, and the dockwall between the CDF and Liquid Cargo Pier.

Current Replacement Value

Current replacement value of Port's green infrastructure and public spaces assets are estimated to total $396,000. Note that replacement value does not include the value of land.

Condition Assessment

Green infrastructure and public spaces condition assessments were completed by visual inspection and discussion with Port staff. The stormwater management facility was assessed for sufficient capacity and operating condition to appropriately manage stormwater needs. Other areas of green infrastructure and public spaces were assessed for ease of public access, vegetation growth, and condition of any public amenities present. Since these assets have differing maintenance and replacement requirements, a two-level condition rating system was utilized that identifies the assets as Functional or Nonfunctional in fulfilling the service they are providing. The following provide examples of conditions considered nonfunctional:

- Public space assets in need of significant repair or where public access is hindered would be considered Nonfunctional.
- Stormwater management facilities not meeting water management needs would be considered Nonfunctional.

Current Condition

Current condition ratings for green infrastructure and public space assets were all determined to be functional. No major repairs or maintenance requirements were observed. A condition summary was prepared to document the assessment.

LEVEL OF SERVICE

Table 22 - Level of Service Factors for Green Infrastructure and Public Space Assets

LOS Factor	Performance Indicator, Target, and Other Considerations
Organizational Goals	Maintain green infrastructure in functional condition.
Stakeholder expectations and considerations	Public expects accessibility maintained or improved.
Legislative / Regulatory Requirements	Stormwater Management Facility: Meet WDNR maintenance requirements.
Economic Considerations	Maintain effective stormwater management to protect other Port assets.

RENEWAL STRATEGIES & PLAN

Table 23 - General Renewal Strategy Considerations for Green Infrastructure and Public Space Assets

Renewal Strategy Factor	Considerations
Level of Service	Maintain in functional condition. Improve public access were
Risks	Public access to waterfront areas requires Port security tools to maintain safety of other Port assets.
New Technologies	Consider use of green technologies (i.e., rain gardens) in future stormwater management planning.
Growth	Consider inclusion of additional green infrastructure and public spaces in any future expansion plans.
Environmental Impacts	Work with City to maintain and improve wetland habitat area at Grand Trunk. Look for opportunities to implement proposed green infrastructure solutions identified by Harbor District Inc. in their Port Milwaukee Storm Water and Green Infrastructure Plan (2020).

Asset Renewal Plan

An asset renewal plan workbook was developed for this asset category. Renewals generally include maintenance activities for the stormwater management facility and Lake Express public access facilities. Total renewal costs estimated for these facilities through 2070 is about $1.6M.

Assumptions

- Only mowing and minor maintenance included in current renewal plans. Stormwater management facility to be monitored for functionality and condition of pond liner periodically inspected.

7. LIGHTING

STATE OF INFRASTRUCTURE

Inventory

Port assets in the lighting category include lights that are independent of street lighting and building or parking area lighting. The inventory includes seven floodlight clusters on poles. Three flood light poles are located in the City Heavy Lift Dock area and four are located in the Intermodal Yard. All inventoried lights serve to illuminate work areas. Streetlights and flood lights mounted on street light poles are assumed to be managed by the City of Milwaukee DPW, not the Port. Existing asset data for lights indicating age, model, and type were not available. The asset inventory data was derived from what could be inferred at ground level during the inspection.

Current Replacement Value

Current replacement value of Port's lighting assets is estimated to total $14,000 which represents a small portion of the Port's asset portfolio.

Condition Assessment

Lighting condition assessments were completed by visual inspection from the ground during daylight hours. Due to limitations for accessing lighting fixtures they were not closely inspected.

A condition rating based on remaining useful life (RUL) has been established for lighting as presented int Table 24.

Table 24 - Lighting Asset Condition Rating

Condition Rating	Excellent	Good	Fair	Poor	Deficient
Remaining Useful Life (RUL)	>15	10-15	3-10	<3	Beyond Useful Life

Current Condition

All support poles were found to be in good condition. The lights were assumed to be in working condition. Overall, each lighting asset was assumed to have three-quarters of their useful life remaining (or about 15 years) since installation or renewal dates are not available.

Assumptions

- Light fixtures were assumed to be in working condition. Lighting was inspected only during daylight hours.
- Lighting wattage assumed to fulfill working and safety needs for illuminated areas.
- Per Port guidance – flood lights mounted on city maintained light poles assumed to be maintained by city.

LEVEL OF SERVICE

Table 25 - Level of Service Factors for Lighting Assets

LOS Factor	Performance Indicator, Target, and Other Considerations
Organizational Goals	Maintain lighting in good working condition as measured by estimated remaining useful life. Provide level of illumination to clearly identify persons or objects and create a safer work environment as well as a psychological deterrent to criminal activity in the area. Security lighting should provide a level of illumination to clearly identify persons or objects and create a safer work environment as well as psychological deterrent to criminal activity in the area.
Stakeholder expectations and considerations	Provide security Provide security and illumination of dock/yard to provide for safe and efficient operation during hours of darkness. Provide reliable lighting as part of overall Port security plan.
Legislative / Regulatory Requirements	Align replacements with City standards
Economic Considerations	None identified.

RENEWAL STRATEGIES & PLAN

Table 26 - General Renewal Strategy Considerations for Lighting Assets

Renewal Strategy Factor	Considerations
Level of Service	Maintain level of service.
Risks	Some value on operational safety with function lights on CHLD. Maybe none identified.
New Technologies	Factor energy efficiencies into replacements (e.g., LED). Consider opportunities for incorporating renewable energy sources (e.g., solar).
Growth	Expansion of secured port areas should be considered during lighting renewals.
Environmental Impacts	Incorporate lighting designed to improve energy efficiency and reduce light pollution when replacing.

Asset Renewal Plan

For the lighting asset category, the Asset Renewal Plan Workbook is organized by light pole and provides a unit cost for replacement of the entire light and pole structure. Replacement frequency is based on assumed age of current lighting assets. The assumed RUL is provided as a placeholder in the renewal plan workbook to program replacement costs over the 50-year planning horizon for each light. These can be refined in subsequent plan update when additional asset information is available. Total renewal costs currently estimated for lighting renewals through 2070 is about $49,000.

Assumptions

- Lighting wattage and placement assumed to fulfill working and safety needs for illuminated areas.
- Assumes Port will have need to replace each light asset at the end of its useful life.

8. PAVEMENT AND ROADS

STATE OF INFRASTRUCTURE

Inventory

The Port's pavement and roads asset category includes roadways, pavement areas, and walkways in the South Harbor Tract. Roadway assets are primarily service roads. The City of Milwaukee maintains public roadways within the Port boundaries. Roadways sections are typically asphalt with no curb and limited shoulder. Some concrete pavement roadway sections are present. Roadway sections in the South Harbor Tract do not include sidewalks. Pavement areas included in this asset category are those generally not associated with a building asset such as the City Heavy Lift Dock. A complete list of the pavement and road assets included in this category are provided in Table 27 below.

Table 27 - Pavement and Roadway Assets

ASSET ID	ASSET TYPE
HIGH-WIDE ROUTE	Roadway
SOUTH HARBOR DRIVE EXTENDED	Roadway
LAKE EXPRESS DRIVE	Roadway
HARBOR-BAY DR ACCESS ROAD	Roadway
WEST TURNING BASIN SERVICE ROAD	Roadway
HARBOR-LINCOLN DR SOUTH ACCESS ROAD	Roadway
EAST TURNING BASIN ACCESS ROAD	Roadway
SOUTH CARFERRY DR.	Roadway
SOUTH CARFERRY DR ACCESS ROAD	Roadway
CAR FERRY-HARBOR DR ACCESS ROAD	Roadway
HARBOR-LINCOLN DR NORTH ACCESS ROAD	Roadway
CITY HEAVY LIFT DOCK SERVICE ROAD	Roadway
CITY HEAVY LIFT DOCK PAVEMENT	Pavement Area
CITY HEAVY LIFT DOCK CONCRETE APRON	Pavement Area
TERMINAL 1 PAVEMENT	Pavement Area
TERMINAL 1 CONCRETE APRON	Pavement Area
SOUTH SLIP 1 WEST APRON	Pavement Area
SOUTH SLIP 2 WEST APRON	Pavement Area
SOUTH SLIP 3 WEST APRON	Pavement Area
SOUTH SHORE CRUISE DOCK PAVEMENT	Pavement Area
LAKE EXPRESS WEST PARKING LOT	Parking Lot
LAKE EXPRESS EAST PARKING LOT	Parking Lot
KASZUBE'S PARK LOT	Parking Lot
RUSSELL AVENUE PIER ACCESS WALKWAY	Walkway
LAKE EXPRESS WALKWAY	Walkway

Current Replacement Value

Current replacement value of pavement and road assets are estimated to total $6,048,740. About 70% of this total replacement value is comprised of the Terminal 1 Pavement area and City Heavy Lift Dock area replacement values at $1.5M and $2.8M respectively.

Condition Assessment

Pavement and road assets were inspected visually using both in-person and drone imagery tools. Observed pavement surface conditions were rated using the Pavement Surface Evaluation and Rating (PASER) method developed by the Transportation Information Center at the University of Wisconsin-Madison. The PASER manual is used to describe types of defects and provides a simple system to visually rate pavement. PASER manuals are available to assist in rating asphalt, concrete, and gravel road surfaces. The PASER system also employs a five-point condition rating that aligns with the scheme used throughout this CARP. A summary of the condition rating based PASER rating is provided in Table 28 below.

Table 28 – Pavement and Road Asset Condition Rating

Condition Rating	Excellent	Good	Fair	Poor	Deficient
PASER Rating	8-10	6-7	4-5	2-3	1

Current Condition

Pavement and road assets exhibited the range of conditions from poor to excellent. Pavement condition rating by asset type and total area is provided in Figure 9. A summary of the pavement condition assessments is provided as attachment to the CARP. Current pavement conditions are generally spread across the lifecycle, with most of the pavement area rated as good to fair. About 188,000 SF of pavement is considered in poor condition (~17%).

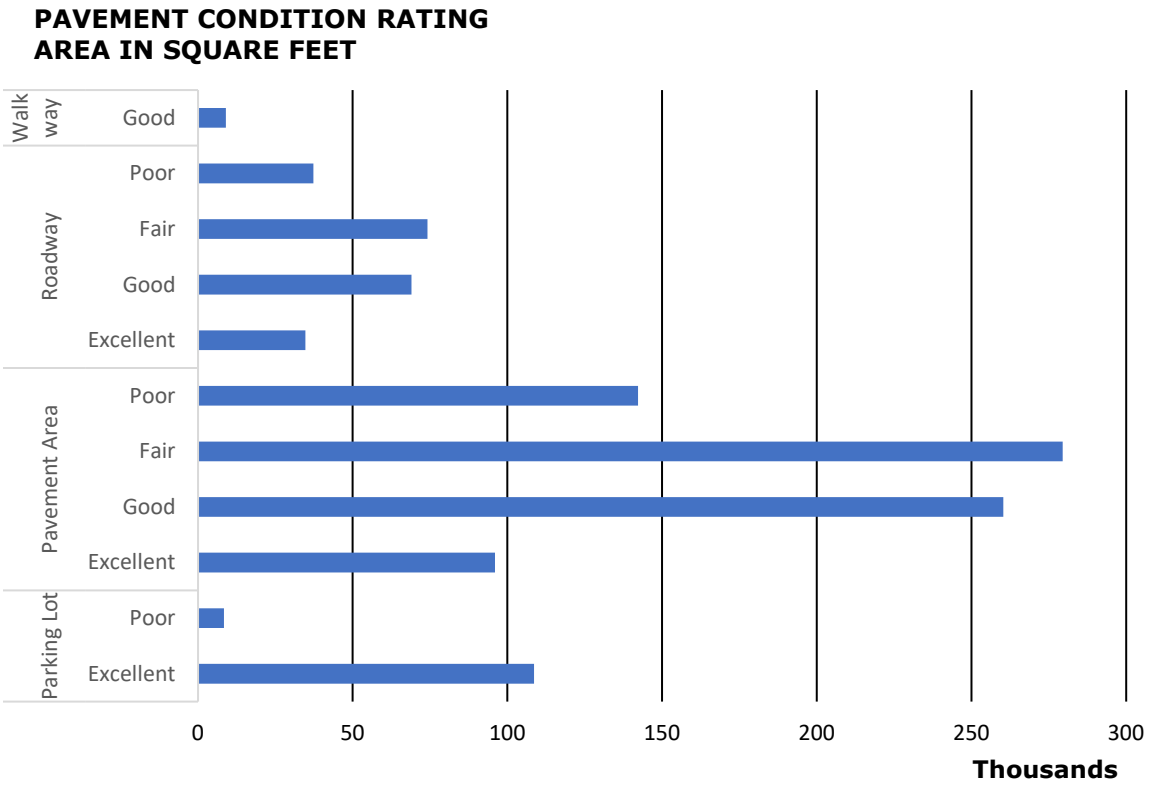

Figure 9 - Pavement Current Condition Summary

LEVEL OF SERVICE

Table 29 - Level of Service Factors for Pavement and Road Assets

LOS Factor	Performance Indicator, Target, and Other Considerations
Organizational Goals	Maintain in good condition as defined by PACER rating of 6-7.
Stakeholder expectations and considerations	Port tenants expected pavement inventory provides safe and reliable traveling surface for large freight vehicles.
Legislative / Regulatory Requirements	Meet maintenance standards of WisDOT and City of Milwaukee DPW.
Economic Considerations	Align renewals with City Public Works Department renewals for island roadways to achieve cost efficiencies. Optimize renewals to maximize pavement lifecycle.

RENEWAL STRATEGIES & PLAN

Table 30 - General Renewal Strategy Considerations for Pavement and Road Assets

Renewal Strategy Factor	Considerations
Level of Service	Maintain or improve level of service Improve stormwater drainage or other to maximize pavement lifecycle. Align with other regional Port best management practices (BMPs).
Risks	Failure of roadway assets may increase risk to public safety and port commercial activity. Maintaining defined level of service will reduce risks.
New Technologies	Consider use of alternative pavement options.
Growth	Plan for heavier vehicles use and cranes when renewing pavements
Environmental Impacts	Consider some storm water pavement solutions in defined areas. Evaluate reduced energy materials (lower carbon footprint).

Asset Renewal Plan

The asset renewal plan for pavements and roads includes recommended maintenance and replacements based on current condition and estimated remaining useful life. Renewals are arranged by asset and broken into subsections where distinct repair areas are identified. High interest, poor condition, areas identified as Harbor-Lincoln Dr North Access Road, South Slip 1 West Apron and Terminal 1 Pavement area. Total renewal costs estimated for rail renewals through 2070 is about $9.2M.

Assumptions

- Pavement sections have been assumed based on experience with similar. Information such as thickness and type of granular base and pavement not available in current Port asset data.
- Routine maintenance of pavements including patching and sealing are performed.

9. RAIL

STATE OF INFRASTRUCTURE

Inventory

The Port has over 10 miles of rail identified in the asset inventory with a little more than a third of that under leased service. The asset inventory was obtained from the Port Asset Database (PAD) and is organized into track segments and switches. At the time of plan development, digital mapping data of rail assets was not available and was not developed for the CARP. Locational and length data for rail inventories were derived from the Track Inventory Map (Sheet R-1) prepared by Via Rail Logistics, LLC (2012). The 2012 inventory map and PAD had some discrepancies

between them and as compared to the conditions observed in the field likely due to age of the data. Discrepancies identified are noted as appropriate in the Capital Asset Renewal Plan Workbook. Future work to digitize rail asset inventories will aid in managing rail asset renewal plans and future updates.

Current Replacement Value

Current replacement value of rail assets is estimated to total $25,000,000.

Condition Assessment

A detailed inspection of rail assets was performed in 2020 by Volkmann Railroad Builders on behalf of Port Milwaukee. Several recommendations for priority repairs were made by Volkman (April 13, 2020 letter to Brian Kasprzyk). The Volkman inspections and findings, which utilized a standard inspection form and were performed by qualified inspectors, serve as the basis for the condition assessment performed for this initial CARP. The Volkman rail inspection findings and repair recommendations were evaluated and summarized into a data table (Milwaukee Rail Asset Inventory and Condition Assessment Summary.xlsx). An estimated remaining useful life (RUL) for each rail asset was determined based on the inspection results and estimated age. A 5-point condition rating based on RUL has been established for rail assets as shown in Table 31.

Table 31 - Rail Asset Condition Rating

Condition Rating	Excellent	Good	Fair	Poor	Deficient
Years Remaining Useful Life (RUL)	>40	25-40	10-25	<5	Beyond Useful Life

Current Condition

Overall condition of rail system is serviceable. About half of the rail inventory is rated as good or better based on estimated remaining useful life. Some poor and deficient track segments are identified (combined for about 27%). Details of the condition for each track segment are identified in the summary worksheet (Milwaukee Rail Asset Inventory and Condition Assessment Summary.xlsx). An overview of the condition rating by track type (leased / non-leased) is provided in Figure 10.

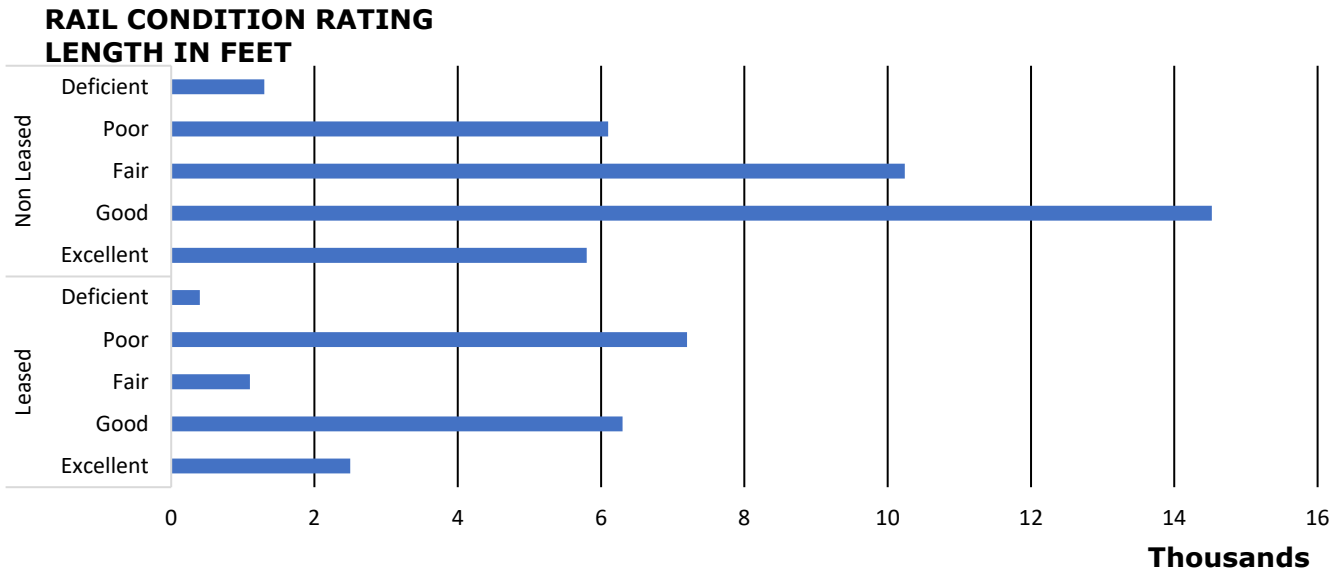

Figure 10 – Rail Current Condition Summary

Assumptions

- Estimated remaining useful life for rail assets was derived from condition reports where possible. When not possible, judgment has been made based on available information.

LEVEL OF SERVICE

Table 32 - Level of Service Factors for Rail Assets

LOS Factor	Performance Indicator, Target, and Other Considerations
Organizational Goals	Maintain in good condition as defined by remaining useful life of greater than 25 years.
Stakeholder expectations and considerations	Maintain rail to meet tenant expectation for reliable and safe performance.
Legislative / Regulatory Requirements	Railway requirements/regulations FRA, OCR, Class 1 Standards
Economic Considerations	Leverage state/federal funding to supplement renewal costs.

RENEWAL STRATEGIES & PLAN

Table 33 - General Renewal Strategy Considerations for Rail Assets

Renewal Strategy Factor	Considerations
Level of Service	Maintain level of service Upgrade rail to 115 lb. weight and switches (Samson). Raise railyards and switches above road grade to prevent roadway runoff and silting in of switches at road grade crossings.
Risks	Categorize track area/segments into priority areas based on condition and use. Evaluate coastal factors associated with risk to flooding of rail assets and operations. Manage grant funding risks through implementation of CARP.
New Technologies	None identified.
Growth	Expand rail system to accommodate Ag Export Project.
Environmental Impacts	None identified.

Asset Renewal Plan

The asset renewal plan workbook developed for the rail asset category is organized by track segment. Switch renewals are included with an associated track segment. Total renewal costs estimated for rail renewals through 2070 is about $44.7M.

Due to the pending rail improvement projects stemming from the ag export project and the dated rail a significant update to the rail inventory and renewal planning will likely be required for the next comprehensive plan update.

Assumptions

- Renewal planning for switches assumed that all switches required upgrade to Samson type.
- Renewal planning for tracks assumed that those not currently 115 lb. class, or where track size was not indicated in inspection report, are required to be upgraded.

10. UTILITIES

STATE OF INFRASTRUCTURE

Inventory

Port Milwaukee utility asset category includes water distribution, storm sewer, and sanitary sewer systems across the South Harbor Track and water distribution, sanitary sewer, and dry fire line fire suppression systems across the North Harbor Track Municipal Pier. These systems support water and sewer system requirements of the port and tenant operations across the entire port.

South Harbor Track utility assets, overall system piping lengths:

- Water Distribution, approximately 6.8 miles
- Sanitary Sewer, approximately 3 miles
- Storm Sewer, approximately 2.6 miles

North Harbor Track Municipal Pier utility assets, overall system piping lengths:

- Water Distribution, approximately 0.2 miles
- Sanitary Sewer, approximately 0.2 miles
- Dry Fire Line, approximately 0.2 miles

Current Replacement Value

Current replacement value of Port's utility assets is estimated to total $8,299,350. Figure 11 below shows current replacement value per system.

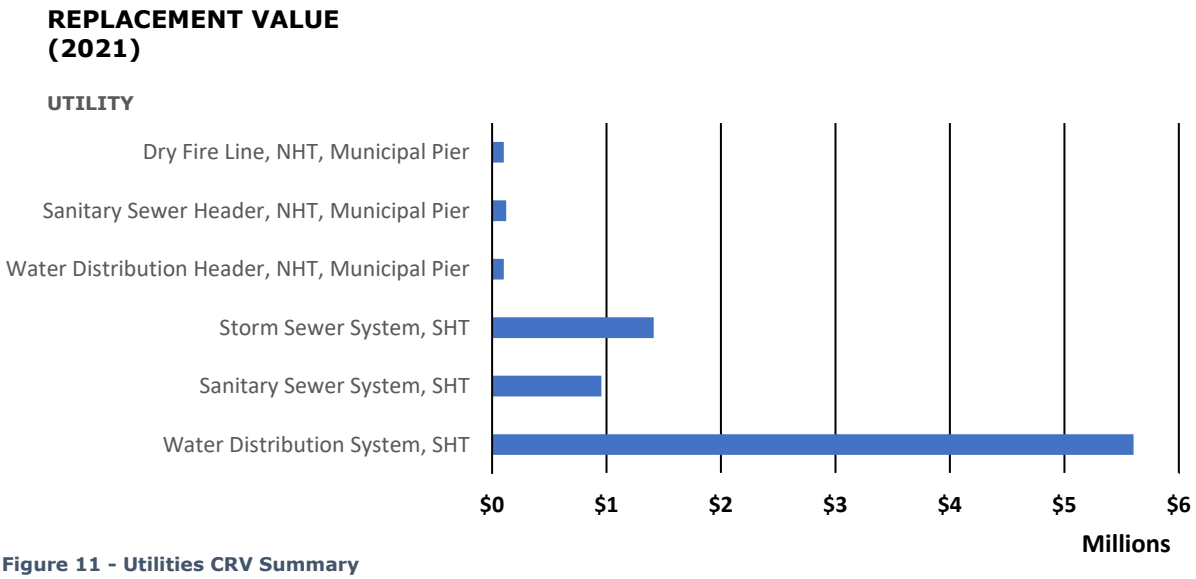

Figure 11 - Utilities CRV Summary

Condition Assessment

The condition assessments and renewal strategy for Port Milwaukee's utility systems including water distribution, sanitary sewer, storm sewer and dry fire line piping systems were based on a desktop analysis using the guidelines of the American Water Works Association (AWWA), Manual of Water Supply Practices, M77 "Condition Assessments of Water Mains".

Utilities were organized into system sections, these sections included the similar piping, valve, hydrant, etc. assets that are located within that area of the system. Within each system section, the assets were organized by size and installation date associated with the pipe in the system; size and date information were based on notes within the utility drawings provided by the Port.

The data used for the desktop analysis was taken from utility service drawings of the South Harbor Tract, Drawing No. C1-1-46 with annotations revised 5-4-1996, and North Harbor Tract, Municipal Pier Breakwater, Drawing C107A revised 6-30-2004 as well as the mid-90's era Port of Milwaukee Infrastructure Report, Sections 7 and 8 for the water distribution system and sewer systems respectively.

The condition assessments were based on the system age and material of construction and is an assumption of conditions derived from the limited data available; detailed historical information regarding system breaks and leaks, system outage repair, and system maintenance was not available.

Existing water system piping material was assumed to be ductile iron pipe. The industry standard life expectancy of buried ductile iron pipe utility systems is 100 years per the Ductile Iron Pipe Research Association (DIPRA) and AWWA.

Existing sanitary and storm sewer piping was assumed to be clay pipe. Although the industry standard life expectancy of modern vitrified clay pipe utility systems is over 100 years per the National Clay Pipe Institute (NCPI), there exist many critical variations in the historical standards for the manufacture and installation of old clay (non-vitrified) piping, therefore the conservative estimate for life expectancy of 60 years is used.

These industry standards were used as the assumed effective useful life (EUL) when assessing the water and dry fire system conditions. EUL is shown simply as the useful life (UL) within the Asset Renewal Plan Worksheets for all utility systems.

The condition rating listed for the utility systems is based on remaining useful life (RUL) of the component in years, derived from the EUL and the component age, as shown below.

$$Remaining\ Useful\ Life\ (RUL) = \ Effective\ Usefull\ Life\ (EUL) - Component\ Age$$

Table 34 - Utility Asset Condition Rating

Condition Rating	Excellent	Good	Fair	Poor	Deficient
Years Remaining Useful Life (RUL)	>50	20-50	10-20	<10	Beyond Useful Life

Current Condition

The current conditions of Port Milwaukee's utility systems show the majority of the systems are well into their remaining useful life. Significant costs for replacement of portions of water and sewer systems could potentially be required within the near future as well as increased replacement costs across most of the systems over the next 50 years. Considering the industry described effective useful life of between 60 and 100 years and the average ages of the Ports current utility systems as described below.

The average age of the current Port Milwaukee utility systems:

- SHT Water distribution system average age 52 years
- SHT Sanitary sewer average age 54 years
- SHT Storm sewer average age 56 years
- NHT Water, sewer and fire line average age 17 years

Figure 12 below shows the existing utility sytems piping lengths per condition rating for each system.

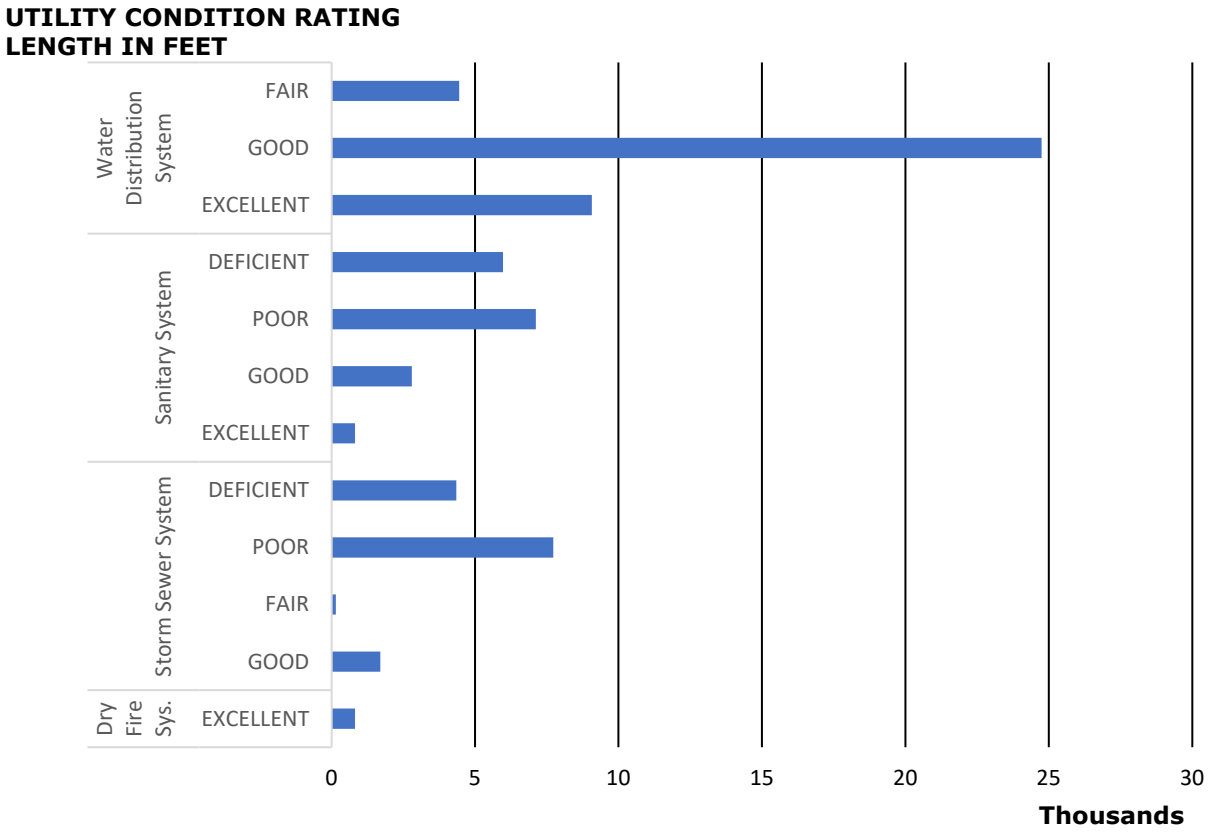

Figure 12 - Utility Current Condition Summary by System Type

Assumptions

- Assumed existing sewer (sanitary and storm) systems are clay pipe with an effective useful life of 60 years.
- Sanitary Sewer system piping to be replaced with PVC Pipe, SDR 35, gasketed flanged sealed joints, with an effective useful life of 100 years.
- Storm Sewer system piping to be replaced with reinforced concrete pipe, un-gasketed soil tight joints, with an effective useful life of 100 years.
- Assumed existing water systems are ductile iron (DI) pipe with mechanical joints with an effective useful life of 100 years, to be replaced with same.
- Replacement of pipes to include excavating, trenching, backfill only as required for pipe size, and paving with typical asphalt or concrete; additional cost may be incurred for high strength reinforced or sealed concrete surface.
- Existing storm sewer system includes new buried storm drawings along S. Carferry Dr, replacing culverts as city piping, not within Port sewer system scope.
- Assuming all piping on NHT Municipal Pier is ductile iron DI Class 50 piping.
- Additional detailed analysis will be required for recommended actions to improve coastal resiliency, specifically concerning the storm sewer system.

LEVEL OF SERVICE

Table 35 - Level of Service Factors for Utility Assets

LOS Factor	Performance Indicator, Target, and Other Considerations
Organizational Goals	Maintain utility systems in good condition as defined by remaining useful life of 20 years or better.
Stakeholder expectations and considerations	Storm Sewer: Provide functional storm water drainage to minimize ponding and standing water in operational areas. Look for opportunities to include BMPs and GI in storm sewer system renewals. Sanitary Sewer: Functional and safe sanitary sewerage disposal. Water Distribution: Provide water and sewer systems as required by port and tenant operations.
Legislative / Regulatory Requirements	Storm Sewer: MS4 permit requirements. SWMP requirements. Sanitary Sewer: City of Milwaukee inspection and maintenance requirements. MMSD discharge permit (NOI) Water Distribution System: Operate and maintain system in accordance with state and federal requirements for drinking water systems.
Economic Considerations	Industry drivers for utility system operational changes should be considered. System capacity changes could be affected due to industry demands.

RENEWAL STRATEGIES & PLAN

Table 36 - General Renewal Strategy Considerations for Utility Assets

Renewal Strategy Factor	Considerations
Level of Service	Maintain or improve level of service. All utility systems will require additional inspections both internal and external to the system to provide a deeper insight into the systems' conditions beyond the desktop analysis completed. Plan improvements based on coastal resiliency factors associated with flooding risk relative to storm sewer infrastructure.
Risks	Utility assets are inherently risky due to their buried nature. Regular inspection and maintenance of buried utility assets should be performed to minimize risk of unexpected failures. Regular inspection program.
New Technologies	Consider operational changes to reduce accelerated deterioration. Additional
Growth	Water Distribution: Plan improvements to system capacity and operations based on future growth to shipping tonnage and cruise industry business demand.
Environmental Impacts	Weather exposure or corrosive underground conditions could accelerate system deterioration.

Asset Renewal Plan

The asset renewal plan for utilities including water distribution, storm sewer, sanitary sewer systems and dry fire line fire suppression system includes recommended inspections and maintenance as described below and listed in the Utilities Asset Renewal Plan Workbook. Inspections are recommended per the guidelines of American Water Works Association (AWWA), Manual of Water Supply Practices, M77 "Condition Assessments of Water Mains".

Documentation of all current and recent maintenance, system breaks and leaks, both minor and major outages for all utility systems is recommended and will allow for further review and analysis of utility system conditions. The analysis of this data will indicate high risk or problem areas in the system, and along with the remaining useful life, help guide future decisions on where investments are needed for utility system maintenance, repair, and expansion.

Buried piping systems shall be replaced on a partial section phased base as necessary based on the age of the system and as necessary to reduce the operational impact of leads and breaks.

Maintenance should be performed on system components, including but not limited to valves, hose connections, pumps, hydrants, etc. in accordance with the original equipment manufacturers' recommendations.

Assumptions

- Recommended strategy includes a combination of review of recent historical system breaks and leaks and periodic system inspections in the near- and long-term future.
- Additional visual and electronic inspections of piping, valve, hydrant, and connection components will be required to determine the system conditions, maintenance plans and future replacement budget and scheduling needs.
- Additional inspections are recommended per the guidelines of American Water Works Association (AWWA), Manual of Water Supply Practices, M77 "Condition Assessments of Water Mains".

11. VEHICLES, VESSELS, CRANES, AND OTHER EQUIPMENT

STATE OF INFRASTRUCTURE

Inventory

Port Milwaukee equipment category includes cranes, waterborne vessels, vehicles, power and compressed air equipment, emergency response equipment and security equipment. These items are used across the Port properties supporting all operations of the port and its clients and tenants. The list below summarizes the asset types within the equipment category.

- Fleet vehicles, Quantity (9)
- Vessels, Quantity (3)
- Cranes, Quantity (6)
- Forklifts, Quantity (3)
- Tractors, Quantity (3)
- Power & Compressed Air, Quantity (6)
- Boom Lifts, Quantity (2)
- Emergency Response & Security Equipment, Quantity (23), including light towers, gates, message centers, modular trailers, and oil booms.

Current Replacement Value

Current replacement value of Port's equipment assets is estimated to total $17,675,000. Figure 13 below shows current replacement values by equipment category.

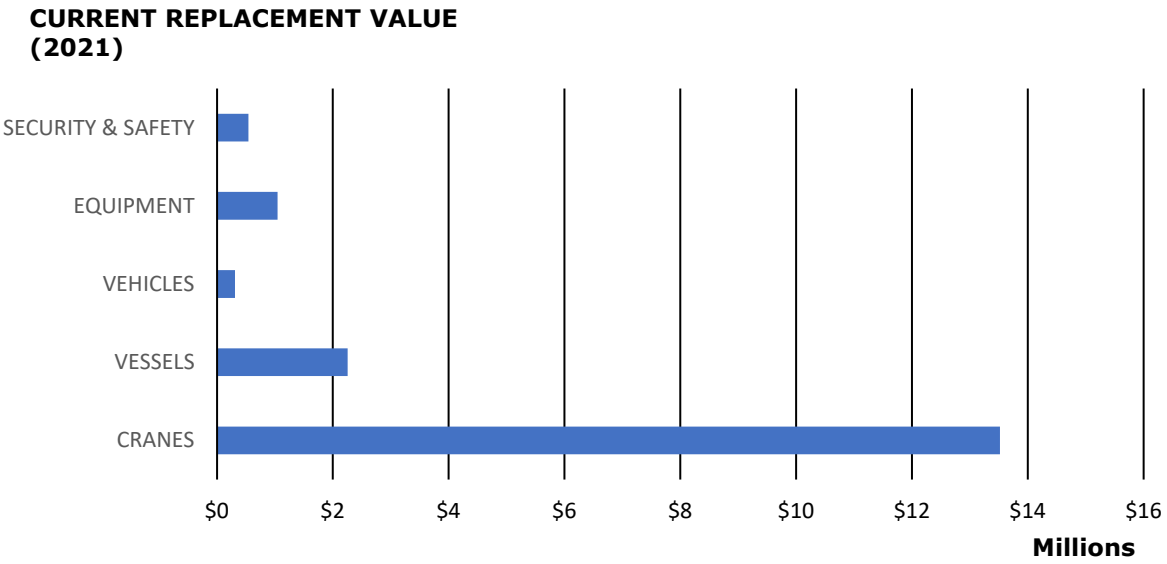

Figure 13 - Equipment CRV Summary

Condition Assessment

Condition assessment of the Port's equipment assets included a desktop analysis of the equipment's age, current operational status, available historical maintenance records, and current operational needs of the Port. Interviews were held with Port Engineering and Operations staff to review the conditions and current use of each major piece of equipment; the information gained through these discussions supplemented the desktop analysis.

The condition rating of each piece of equipment is based on the % of remaining useful life (% RUL). This allows the normalized evaluation of condition across various types of equipment with a range of estimated useful lives (UL).

Table 37 - Equipment Asset Condition Rating

Condition Rating	Excellent	Good	Fair	Poor	Deficient
% Remaining Useful Life (%RUL)	>90	40-90	20-40	<20	Beyond Useful Life

Current Condition

Figure 14 below shows the distribution of equipment items across condition ratings, with 80% of the equipment items in either excellent or good condition. There are 9 items of equipment that are in either poor or deficient condition. These items of highest concern for the Port are listed below and should be inspected further to determine a more accurate evaluation of remaining useful life and identify what maintenance actions are required to bring these assets back into operation as required by port operations.

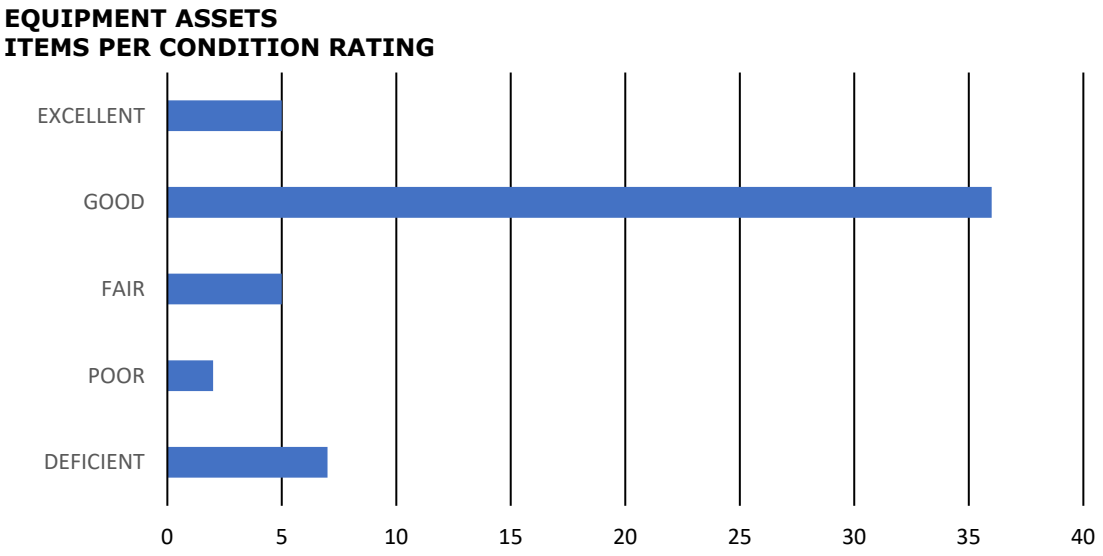

Figure 14 – Equipment Current Condition Summary

Table 38 - High Interest Equipment Assets (Deficient and Poor Condition Ratings)

ASSET ID	ASSET TYPE	MANUFACTURER	PURCHASE YEAR	CONDITION RATING	Renewal Approach Summary
Mastercraft Forklift 6000#	FORKLIFT	MASTERCRAFT INDUSTRIAL EQUIPMENT	?	DEFICIENT	Original purchase year of this forklift is unknown. Inspection is required for continued operation but the condition rating may be acceptable for continued use.
Dodge Caravan (2010)	VEHICLE	DODGE	2010	DEFICIENT	Condition rating based on useful life and recommended vehicle interval replacement strategy. Vehicles to be replaced every 5 to 10 years based on use.
Dodge Ram 3500 Reg Cab DRW Dump (2007)	VEHICLE	DODGE	2009	DEFICIENT	Condition rating based on useful life and recommended vehicle interval replacement strategy. Vehicles to be replaced every 5 to 10 years based on extent of use.
GMC Sierra 2500 Reg Cab SRW 4x4 (2009)	VEHICLE	GMC	2009	DEFICIENT	Condition rating based on useful life and recommended vehicle interval replacement strategy. Vehicles to be replaced every 5 to 10 years based on use.
Ingersoll-Rand (Air Compressor, Trailerable)	COMPRESSOR	INGERSOLL-RAND	1985	DEFICIENT	Estimated age, Compressor to be inspected and preventative maintenance performed per OEM recommendations as required for continued use.

ASSET ID	ASSET TYPE	MANUFACTURER	PURCHASE YEAR	CONDITION RATING	Renewal Approach Summary
70 TON GANTRY CRANE / #09	CRANE	CLYDE	1952	DEFICIENT	No planned operation at this time. Crane is not certified. No plans to recertify.
Sullair 185 CFM Compressor / Towable (2015)	COMPRESSOR	SULLAIR	2015	DEFICIENT	Currently out of service. Evaluate if asset is required for future port operations. Maintenance required per original equipment manufacturer to return to service.
90 TON BUCYRUS ERIE TRUCK CRANE / #18	CRANE	BUCYRUS-ERIE	1980	POOR	Continue to maintain crane operational, continued load testing for recertification. Future higher capacity and rough terrain capability replacement to be considered in the future.
Jeep Patriot Latitude (2012)	VEHICLE	JEEP	2013	POOR	Condition rating based on useful life and recommended vehicle interval replacement strategy. Vehicles to be replaced every 5 to 10 years based on use.

Assumptions

- The condition rating is based on percent of remaining useful life of each equipment item. The specific condition of each equipment item can be evaluated with further inspection as required to determine future maintenance and replacement.

LEVEL OF SERVICE

Table 39 - Level of Service Factors for Equipment Assets

LOS Factor	Performance Indicator, Target, and Other Considerations
Organizational Goals	Maintain assets in state of good repair as defined by having a percent remaining useful life of greater than 40%. Provide the equipment required to support Port operations.
Stakeholder expectations and considerations	Tenants and clients expect safe and efficient Port operations using applicable and sufficient vehicles and equipment.
Legislative / Regulatory Requirements	Maintain vehicles, vessels, cranes, and equipment in accordance with the applicable industry codes and standards as well as original equipment manufacturer (OEM) recommendations.
Economic Considerations	Consider the environmental and economic impacts and feasibilities of electric vehicles and renewable energies in the future as applicable.

RENEWAL STRATEGIES & PLAN

Table 40 - General Renewal Strategy Considerations for Equipment Assets

Renewal Strategy Factor	Considerations
Level of Service	Maintain level of service.
Risks	Various asset types within equipment may have various renewal strategy factors. Vehicles are recommended to be evaluated for new technologies while existing cranes can be maintained following current industry standards and practices.
New Technologies	Plan for transition to electric vehicle fleet within the current 50-year renewal planning period. Estimated time horizon is by 2030/2040.
Growth	Consider if growth of Port operations for shipping and cruise industry traffic requires additional equipment capacity.

Asset Renewal Plan

The asset renewal plan for the Port's equipment including vehicles, vessels, cranes, and emergency and security equipment, etc. is listed in the Equipment Asset Renewal Plan Workbook. This plan focuses on standard preventative maintenance as described by the applicable industry standards. Cranes and vehicles shall be inspected and certified in accordance with their applicable requirements. The majority of the equipment is good or excellent operating condition and can continue to be maintained and operated in accordance with the Port's current operations.

The items listed in poor condition, including the 90 Ton Bucyrus Crane #18 and Jeep Patriot Latitude Vehicle are still operational, it is recommended that these be maintained and evaluated for further operation past their useful life as required.

The items listed in deficient condition, specifically the Sullair Compressor and 70-ton Gantry Crane #09 are out of service with no planned operation, it is recommended that the Port review these assets for use as needed in the future. Vehicles shown as deficient, beyond their useful life, may still be operational and can be evaluated for further service and maintained or replaced as required.

Assumptions

- The renewal strategies may vary for each asset type within the equipment category and each asset type should be reviewed individually as required during the Port's future asset management strategy development.
- Emergency response equipment and security equipment is protected and stored when not in use, it can be periodically inspected and maintained as required and may be used beyond its listed useful life.

12. RENEWAL SUMMARY

This CARP serves as a tool for Port Milwaukee to strategically plan significant improvements to port facilities and develop funding strategies for long-term asset repair and replacement. It provides a high level, long-term action plan for asset renewal for a 50-year period and considers key factors influencing asset renewal planning at the Port including the Port's goals, stakeholder input, and long-term trends in coastal conditions and infrastructure resiliency to those conditions. This initial plan, developed in 2020/2021, projects asset renewals through the year 2070. This section summarizes the renewal plan financial information presented for each asset category to provide a complete picture of the Port's infrastructure and renewal need. Values provided in this section are based on the condition assessment and renewal planning completed in 2020/2021.

12.1 CURRENT REPLACEMENT VALUE

The current replacement value (CRV) of Port assets by category is provided in Figure 15.

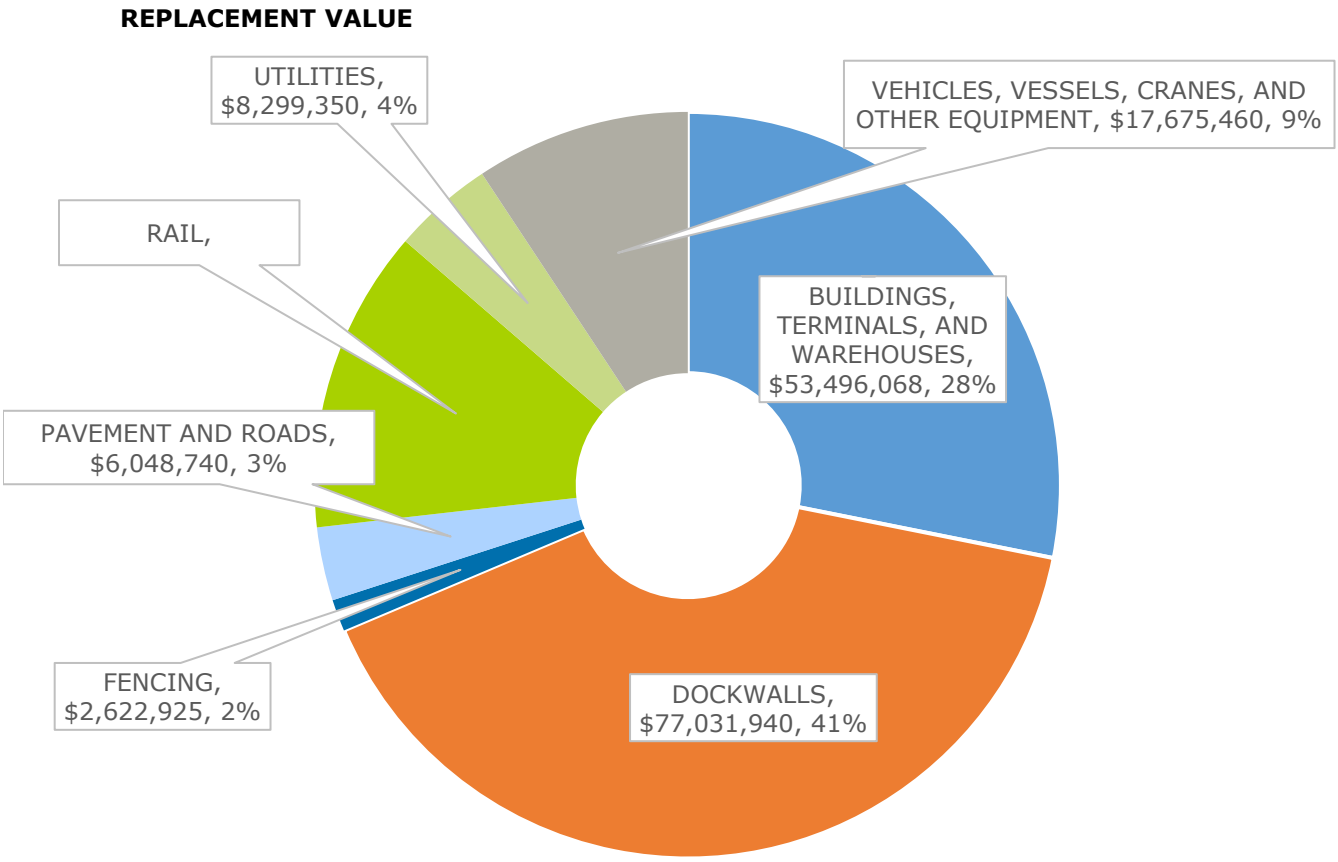

Figure 15 - Current Replacement Value by Asset Category

Dockwall and building assets have the largest share of replacement value representing about 70% of the total asset value followed by rail and equipment at 13% and 9%, respectively. Dockwalls and buildings are long-life assets with relatively high replacement costs. Overall renewal strategy for these assets requires well-planned lifecycle management to optimize their service life. Renewal planning and funding levels should generally follow the relative percentages indicated with dockwalls, buildings, and rail assets receiving the larger shares of renewal funding.

12.2 CURRENT AND PLANNED RENEWAL NEED

A summary of the current and planned renewal needs based on the plans presented in the individual asset category sections is provided in Figure 16. Current renewal need is represented by the capital repairs and deferred maintenance (CRDM) category. Planned needs are the projected renewals per 5-year planning bin. Renewal data represented in Figure 16 is based on the current costs of renewal work that is inflated at an annual rate (in this case 2.2%) to provide a comparison of costs over the planning period relative to today's dollar. Similar to the total CRV relative to each category, the renewal cost over the next 50-year planning period is seen to be primarily influenced by dockwall, building, and rail system renewals. The total renewal need across all categories is about $204M (million) with an average renewal of about $20M every 5-years or a little less than $4M annually. Peaks in the total renewal cost can be flattened by phasing the large renewal project across a longer period. A linear trend line is applied to the data (dashed) which generally shows an increasing renewal cost of about $2M every 5-years. A portion of this is attributable to the inflation factored into the renewal cost projections.

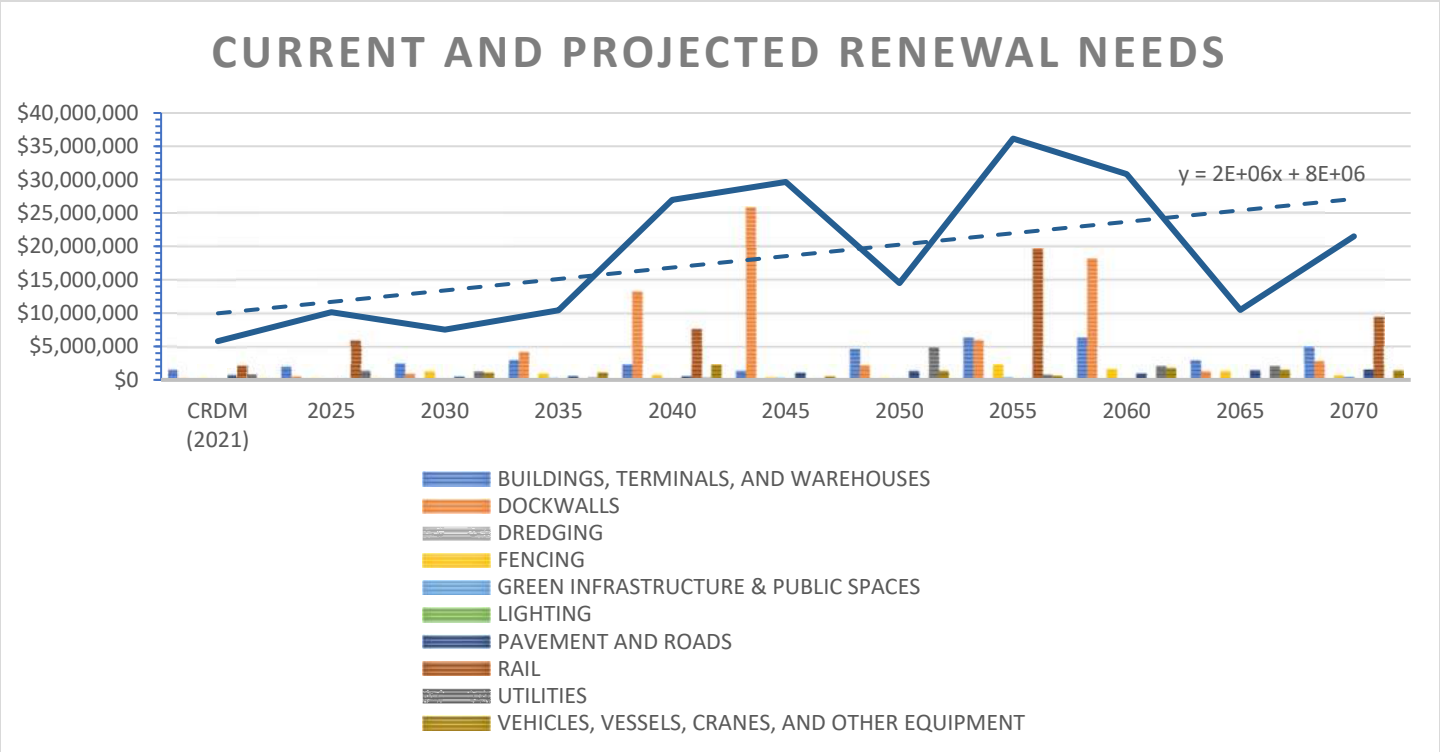

Figure 16 - Current and Projected Renewal Needs

The total 50-year renewal costs by asset category including percent of total are presented in Figure 17.

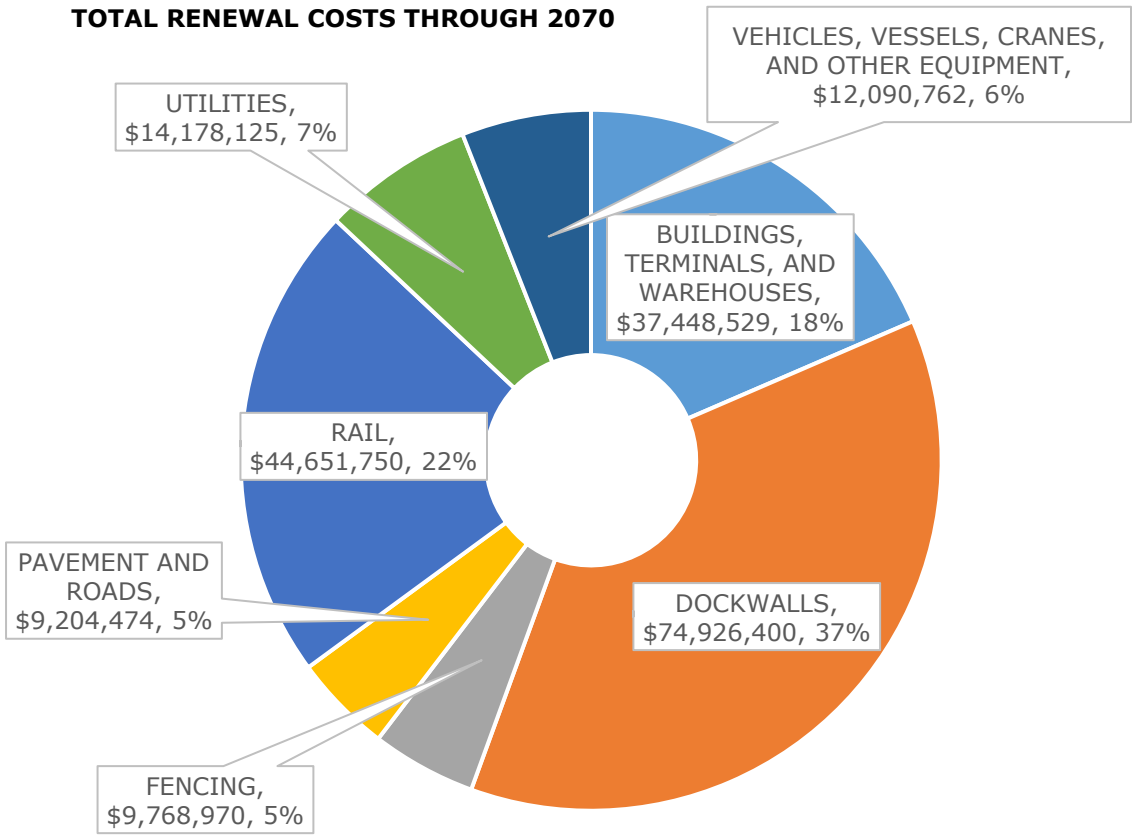

Figure 17 - Total 50-Year Renewal Need by Asset Category

13. CONTINUOUS IMPROVEMENT AND UPDATE

This Capital Asset Renewal Plan has been developed as a stand-alone plan that forms a part of the Port's overall asset management processes and tools. At the time of initial plan development, the Port did not have a comprehensive asset management system established. Implementation of an asset management system at a future date will likely incorporate elements of this renewal plan. Until replaced or otherwise made obsolete, this plan will require regular update of the asset renewal scheduling and to refine strategies.

13.1 COMPREHENSIVE PLAN UPDATE

A comprehensive plan update frequency of 5 years is recommended. This frequency will align with the structure of the asset renewal plan worksheets and is infrequent enough to not be overly burdensome to Port staff and resources. More or less frequent plan updates may be schedule for specific asset categories. Figure 18 identifies the general flow of activities envisioned during a comprehensive plan update.

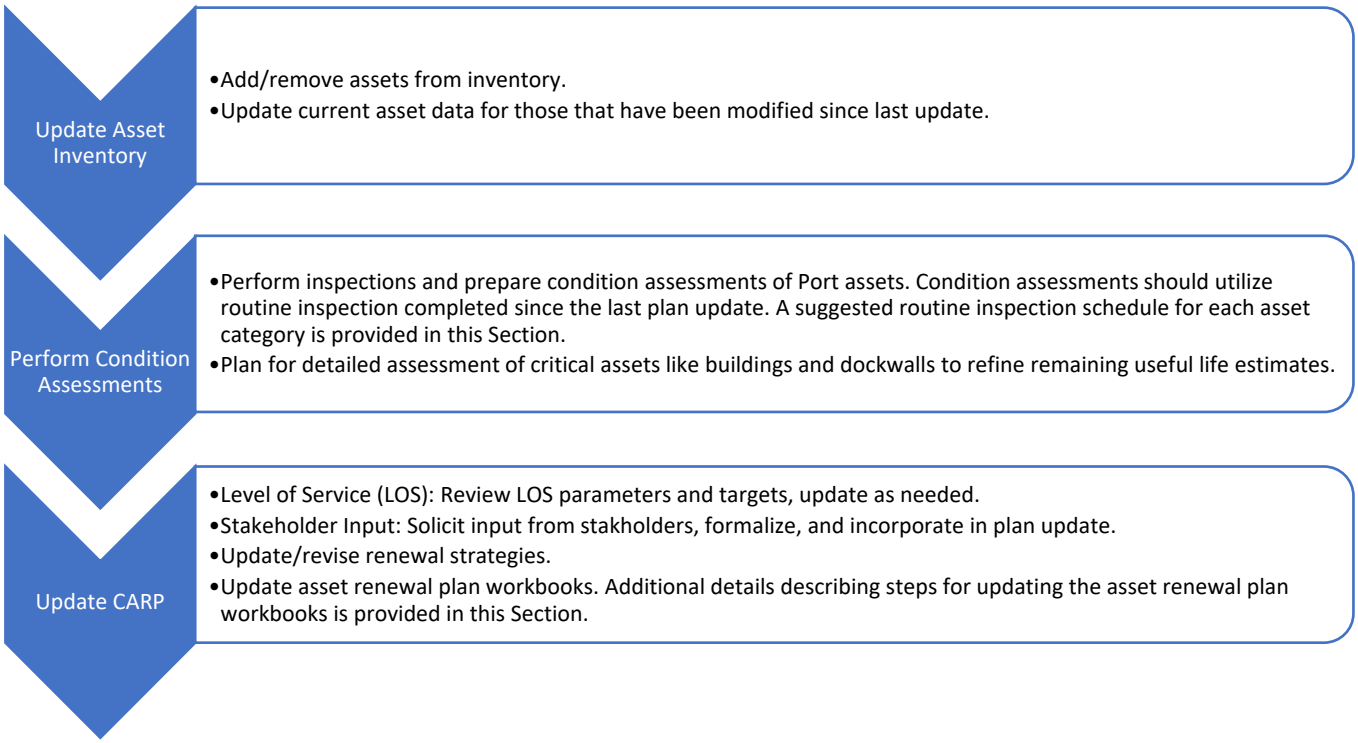

Figure 18 - Comprehensive Plan Update Steps

13.2 UPDATE TO ASSET RENEWAL PLAN WORKBOOKS

Updates to the asset renewal plan to renewal plan workbooks will generally include the following steps:

- Extend planning period 5-years by adding a 5-year bin at end of worksheet. Workbook formulas and reference will need to be checked and updated.
- Add new assets to the plan worksheet by copy an existing asset plan and inserting.
- Add/adjust/shift projected renewal costs and add the renewal costs not completed to CRDM category as appropriate. Check and update estimated unit costs and quantities.
- Update current replacement value by checking and updating unit costs and quantities. Add new assets to CRV worksheets.
- Update summary table by ensuring existing table references are correct and adding new asset lines and references.

13.3 ROUTINE INSPECTION SCHEDULE

A suggested routine inspection schedule by asset category is presented in Table 41 below. A routine inspection of port assets will allow for effective inventory tracking and maintenance planning as well as supporting comprehensive updates to the CARP.

Table 41 – Suggested Routine Inspection Schedule

Asset Category	Inspection Frequency	Inspection Tasks
Buildings, Terminals, and Warehouses	Annual	Visual inspection, tenant interviews
Dockwalls	Biannual	Visual inspection from shore, and from water (boat or drone) as needed. Diver inspection, as needed.
Navigational Areas	Biannual	Bathymetric survey
Fencing	Biannual	Visual inspection
Green Infrastructure and Public Spaces	Biannual	Visual inspection
Lighting	Quarterly	Visual inspection, customer/tenant interviews
Pavement and Roads	Annual	Visual inspection
Rail	Biannual	Visual inspection
Utilities	Annual, as opportunity permits	Visual inspection (internal and external) as accessible, customer/tenant interviews
Vehicles, Vessels, Cranes, and Other Equipment	Quarterly	Visual and mechanical inspection

14. ASSET MANAGEMENT SYSTEM RECOMMENDATIONS

The following section provides recommendations for establishing an asset management system (AMS) at Port Milwaukee. The primary purpose of this Capital Asset Renewal Plan is to provide the Port with a framework for planning major rehabilitation and replacement of port infrastructure, facilities, and equipment. At the time of plan development, Port Milwaukee does not have a comprehensive AMS and is seeking to establish one. This CARP would serve as a plan component under such a system and has been developed within that context.

As indicated in Section 1, this CARP has been developed as a stand-alone plan incorporating the Port's asset management process, tools, and procedures existing at the time of plan development. The CARP has also been developed to align with fundamentals of AMS as envisioned by the International Organization for Standards (ISO) in their standards 55000/55001. A summary of the ISO AMS elements is provided in Table 2. The recommendations provided here are tailored to expand the existing Port asset management processes and this CARP toward a robust AMS that is appropriately scaled to Port Milwaukee.

14.1 OVERVIEW OF RECOMMENDED AMS

The recommended AMS will provide a formalized workflow for the perpetual acquisition, recording, tracking, monitoring, maintenance, securing, reviewing, and physical inventory of Port assets. At a high level, the AMS recommended for Port Milwaukee will consist of two primary components:

(1) the written management system policies, process, and procedures, and
(2) the asset data management system.

The written management system elements would follow the plan-do-check structure of the ISO asset management system. The data management component would be a GIS-based data platform that will provide capabilities for interfacing with other business systems and stakeholders such as City of Milwaukee.

Note that GIS software in and of itself is not a complete asset management system, rather it's a modern, adapted, interactive look into asset data through a geospatial lens. Building a complete geospatial inventory of assets is a foundational step for successful asset management and attribution of GIS features with critical metadata is a required component of any complete asset management strategy. These recommended AMS components are described in further detail in the following sections.

14.2 ASSET MANAGEMENT SYSTEM POLICIES, PROCESS, AND PROCEDURES

All management systems described by ISO (quality, environmental, safety, etc.) have the same general top down, plan-do-check structure which works well when appropriately tailored to the size and needs of the organization. An ISO envisioned AMS system for Port Milwaukee would likely consist of the following main elements:

- Establishment of a formal Asset Management Policy endorsed by Port/City leadership.
- Establishment of a Strategic Asset Management Plan outlining objectives and the Port's approach to asset management.
- Identification of internal AMS champion(s) and assignment of responsibilities and authorities as appropriate for implementation.
- Development of AMS procedures that will include at minimum:
    - Asset data management,
    - Management of change,
    - AMS performance evaluations (to include a quarterly verification and recording schedule to ensure consistency in capital asset management), and
    - Internal audit and management review.
- Establishment of a risk-based decision framework: One such local example is the framework described in MMSD's 2050 Strategic Plan that systematically identifies and mitigates risks tied to defined level of service for District assets.
- Development and continued improvement of a Capital Asset Renewal Plan.

Some of these recommended AMS elements, such as management of change procedures, management review process, and corrective action procedures may already be implemented by Port for other systems and can be expanded and/or combined to support this element of the Port's AMS. A consultant or other external partner with experience may be required to help develop and structure an appropriately scaled AMS for Port Milwaukee. However, like any organizational management system, an externally developed AMS will need to be fully embraced and managed by the organization for it to be sustainable and successful.

14.3 ASSET DATA MANAGEMENT

The recommended asset data management tool for Port Milwaukee will be a GIS-based system. GIS-based systems are the state-of-the-art technology for a wide variety of world-class ports throughout North America and Europe, including Port of Rotterdam, Netherlands, Port of New Orleans, LA, Port of Anchorage, AK, Port of Beaumont, TX, Port of Houston, TX to name a few. Successful models leverage current geospatial technologies to inventory and manage assets and inform stakeholders in real-time. These systems are dynamic and scalable and can support a wide array of port management services including parcel/lease/tenant maps, daily workorder operations, facility maintenance and repair, dredging operations, and safety/security. These systems can facilitate effective internal communication as well as drive public engagement. Data privacy and security are of utmost importance and are forefront in the delivery of this technology.

The maritime / port GIS solutions vary and there is no single system for use in managing port assets. Ports who use GIS-based asset data management tools each have unique approaches and operational circumstances. As such, there is no one size fits all solution. Implementing a GIS-based solution allows Port Milwaukee flexibility to adapt Port-specific needs but will essentially require building the system from the ground up. The recommended model of an implementation strategy would include the following steps:

- GIS Needs Assessment,
- Conceptual Data-Model Design,
- Gap Analysis, and
- Delivery of a Geospatial Model.

Through conducting individual and/or group interviews, GIS data designers could gain a thorough understanding of Port of Milwaukee operational and business needs, while retrieving and documenting critical institutional knowledge. A long-term consulting relationship to help maximize the build-out, maintenance, and delivery of these GIS services will likely be required. Optionally, the GIS-consultant could function in an advisory role to help train Port staff in leveraging this technology to maximize their individual benefit on a daily basis, toward self-performing long-term maintenance.

There is a wealth of current resources available to Port Milwaukee from local GIS systems implemented by County and City of Milwaukee as well as MMSD and SWRPC. However, it is understood that these systems and communication between departments is highly fragmented. Another facet of this recommended strategy would include reaching out to various leaders within the community to help bring people, systems, and data together. Additionally, there are other industry collaborators willing to share their data model, such as the Port of Houston, TX which could help begin the process of implementing of building a GIS asset data management solution.

Other out-of-the-box software packages that are designed for asset management can be considered. However, a GIS-based approach will likely be more versatile, scalable, and accessible for Port Milwaukee’s needs. By building a representative digital twin, all concerned stakeholders will be able to access timely and relevant information through a common and easy-to-use mapping interface. Following the first phase of developing a GIS-based asset data management system, Port Milwaukee may wish to reassess it's need for additional asset management capabilities that are not typically found in the GIS ecosystem, such as financial planning and temporal prediction tools.

CONDITION AND RENEWAL SUMMARY
BUILDINGS

						CONDITION SUMMARY			
Asset ID	**YEAR BUILT**	**CURRENT TENANT**	**CURRENT LEASE TERM**	**CURRENT USE**	**PLANNED USE**	**EXTERIOR**	**INTERIOR**	**SITE**	**RENEWAL SUMMARY / NOTES**
TERMINAL #2 BUILDING	1966	Federal Marine Terminals	2023	Tenant Warehouse/Office Space. Steel Coil. Rail loading on north side.	Tenant Warehouse/Office Space	[Good]	[Good]	[Fair] Settlement and movement of rail loading dock on north side. Rail on south side not in service.	Entire building system to be included in renewal plan. Major renewals include roofing, siding, corrosion protection of steel members, and rail dock rehabilitation.
TERMINAL #3 BUILDING	1960/1961	Federal Marine Terminals	2023	Tenant Warehouse/Office Space.	Tenant Warehouse/Office Space	[Good] Brick façade in good condition. Original windows in fair condition. Damage to north doors from wave action.	[Good]	[Fair] Rail on north and south side not in service.	Entire building system to be included in renewal plan. Major renewals include roofing, windows, and corrosion protection of steel members.
TERMINAL #3A BUILDING	Unknown	Federal Marine Terminals	2023	Mechanic Garage.		[Good] New roof. Metal siding in good condition.	[Fair] Significant corrosion of steel structural members.	[Fair] Perimeter asphalt needs repair.	Former refrigeration building. Shows signs of age but is functioning well for use as mechanical garage. Major renewals may include rehabilitation of corroded structural members and corrosion protection.
TERMINAL #4 BUILDING	1960/1961	Kinder Morgan		Tenant Warehouse/Office Space. Malorganite processing and packaging. Rail loading on north side.	Tenant Warehouse/Office Space	[Good] Brick façade in good condition. Original windows in fair condition. Damage to south doors from wave action.	[Fair] Rehabilitation of column footings. Column #10 is unsupported.	[Fair] Rail on south side not in service.	Entire building system to be included in renewal plan. Major renewals include roofing, windows, corrosion protection of steel members, and steel column footing rehabilitation.
TERMINAL #4A BUILDING	Unknown	Kinder Morgan		Tenant Warehouse for salt processing.		[Poor] Siding severely corroded in locations due to salt. Damage observed throughout.	[Poor] Significant corrosion of structural members observed.	[Fair]	Building is likely beyond suitability for other warehouse uses.
TERMINAL #5 BUILDING	1998	Federal Marine Terminals	2023	Tenant Warehouse Space	Tenant Warehouse Space.	[Fair]	[Fair]	[Fair]	Entire building system to be included in renewal plan. Major renewals include roofing, siding, and asphalt floor replacement.
BRADFORD #1 BUILDING	1994	Federal Marine Terminals	2023	Tenant Warehouse Space	Tenant Warehouse Space.	[Good] Overall good condition. Personnel doors are deficient.	[Fair]	[Fair]	Entire building system to be included in renewal plan. Major renewals include door replacement, siding, and roofing.
BRADFORD #2 BUILDING	1994	Federal Marine Terminals	2023	Tenant Warehouse Space	Tenant Warehouse Space.	[Good] Overall good condition. Personnel doors are deficient.	[Fair]	[Fair]	Entire building system to be included in renewal plan. Major renewals include door replacement, siding, and roofing.
POLE BUILDING #1	1994	Non-Lease (Port Use)	NA	Port Occupied Maintenance and Warehouse Space	Port occupied maintenance and warehouse space	[Fair] Overhead door and structure in good condition. Roof heavily patched. Siding corroded at bottom.	[Fair]	[Fair]	Plan for roof replacement.
POLE BUILDING #2	2018	Non-Lease (Port Use)	NA	Port occupied maintenance and warehouse space	Port occupied maintenance and warehouse space	[Good]	[Good]	[Good]	Potential heating project.
PORT ADMINISTRATION BUILDING	1992	Non-Lease (Port Use)	NA	Port occupied office space and maintenance garage.	Port occupied office space and maintenance garage.	[Good] Problem with stucco on north building face identified.	[Good]	[Good]	Plan for major renewals of roof, windows, siding, general interior renovations, etc.
LAKE EXPRESS BUILDING	2004	Lake Express		Tenant Car Ferry Terminal	Tenant Car Ferry Terminal	[Good]	[Good]	[Good] Large site area. Some drainage and settlement issues identified.	Plan for major renewals of roof, windows, siding, etc. Consider adding permanent maintenance storage and refrigeration unit. Address settlement issues in site walkways.
MILWAUKEE BULK TERMINALS BUILDING	1949	Kinder Morgan		Tenant Warehouse/Office Space. Bulk materials processing and packaging.	None identified	[Excellent] Brand new.	[Good]	[Good]	Plan for major renewals of interior paved floor, window replacement, and exterior brick repair.
COMPASS MINERALS OFFICE BUILDING	1960	Compass Minerals		Tenant Office Space	Tenant Office Space	[Fair] Brick façade in fair condition. Metal fascia and soffits corroded in locations.	[Fair]	[Good]	Interior and site elements in fair condition. Renewal plan to include replacement or rehabilitation of exterior systems, including roof, brick, and windows.
PORTLAND TRUCKING BUILDING	1954	Portland Trucking	2028	Tenant Office/Maintenance Garage	Tenant Office/Maintenance Garage	[Poor] Roof in fair condition. Brick and CMU façade show signs of significant wear and damage.	[Fair]	[Good]	Interior and site elements in fair condition. Tenant indicates planned renovations for interior and site, including paving. Renewal plan to include replacement or rehabilitation of exterior systems, including roof, brick, and windows. Also include pavement replacement.
SEAMAN'S CLUB BUILDING	1939	[Vacant]	NA	Vacant	None identified	[Fair] Brick façade ok. Windows and roof in poor condition.	[Poor] Some damage to interior systems due to vacancy and lack of maintenance.	[Fair]	Significant renovations required to place back into service as office space. Renewal plan to include roof replacement and securing window openings.
SEA SCOUTS BUILDINGS	1956 (#1) / 1979 (#2	Sea Scouts		Warehouse for boating club equipment. Boating club training space.	None identified	Warehouse [Fair] Brick Building [Poor] Brick façade and CMU walls in good condition. Roof, gable siding, and windows in very poor condition.	[Fair]	[Good]	Plan for new roof and windows.

CONDITION AND RENEWAL SUMMARY
DOCKWALLS

DOCKWALL ASSET NAME	TRACT	ASSET TYPE	CURRENT USAGE	SECTION-SPECIFIC STAKEHOLDER(S)	YEAR CONSTRUCTED	HORIZONTAL LENGTH (FT)	TOP OF WALL ELEVATION (FT, IGLD 85)	SSP LENGTH (FT)	BOTTOM OF WALL (TIP) ELEVATION (FT, IGLD 85)	DESIGN DRAFT (FT, LWD, IGLD 85)	DESIGN WALL HEIGHT (FT)	LAST MAJOR RENEWAL	CONDITION SUMMARY (2021)	EST. UL (Years)	EST. RUL (Years)	CONDITION RATING	RENEWAL APPROACH SUMMARY
SEA SCOUTS DOCKWALL	South Harbor Tract - East	SSP DOCKWALL	Small Craft Docking	Sea scouts MMSD	1938	409	585-588	27	558	Design draft not identified.	Not determined.	None identified	Overall condition fair - no major issues observed.	100	20	FAIR	Monitor wall and anchorages. Monitor future dockside uses to restrict surcharges. Replace with dockwall of similar design draft depth at end of useful life.
RUSSEL AVENUE PIER	South Harbor Tract - East	SSP PIER	Public Access Pier	General Public USCG	1938	852	588	30-40	558-548	Design draft not identified.	Not determined.	Areas of deck filled with stone due to loss of material and damage to asphalt.	Overall condition fair - no major issues observed. Port is monitoring loss of fill in pier.	100	20	FAIR	Monitor pier fill and deck for loss of material. Plan for deck rehab project in next 5-years to ensure public use is maintained until structure is replaced. Some point repairs to SSP and anchorages may be required. Replace with pier of similar geometry and use. Upgrade public safety features such as railing and ladders.
LAKE EXPRESS CAR FERRY DOCKWALL	South Harbor Tract - East	CELLULAR SSP DOCKWALL	Car Ferry Docking	Lake Express	1975	605	586.8	45-50	542-537	Design draft not identified.	39	None identified for cellular SSP dockwall. Concrete deck of car ferry pier has been grouted due to settlement and washout of subgrade material.	Overall good condition - no major issues observed.	100	50	GOOD	The cellular SSP wall system is roughly halfway through its useful life. Some localized reinforcement or rehabilitation of the cellular SSP system may be required to maximize RUL.
SOUTH SHORE CRUISE DOCK SOUTH DOCKWALL	South Harbor Tract - East	CELLULAR SSP DOCKWALL	Cruise Vessel Docking	Port	1975	547	586.8	45-50	542-537	Design draft not identified.	39-49	None identified.	Cellular SSP system is in overall good condition. The segment of reinforced concrete dockwall is in poor condition. Fenders need repairs as well.	100	45	GOOD	The cellular SSP wall system is roughly halfway through its useful life. Some localized reinforcement or rehabilitation of the cellular SSP system may be required to maximize RUL. The concrete dockwall segment should either be rehabilitated if commercial docking is to continue or removed/modified to accommodate other uses. Fender repairs are recommended.
SOUTH SHORE CRUISE DOCK EAST RUBBLE MOUND DIKE	South Harbor Tract - East	RUBBLE MOUND DIKE	None - Adjacent to Cruise Dock	Port	1975	369	586.8	NA	NA	NA	NA	None identified. A concrete mattress installation project was noted in the record for wave overtopping erosion protection.	Visible armor layer of revetment appears to be in good condition. Some minor movement/settlement of stone observed.	100	50	GOOD	Overall, structure is functional and can be considered about halfway through its useful life before major rehabilitation of the system and supplementing the stone with new will be required.
DOCKWALL BETWEEN LIQUID CARGO PIER AND CDF	South Harbor Tract - East	SSP DOCKWALL - TYPE E	Public Access	Public	1938	1913	590.8	50	540.8	-13.4	24	1991 - Breakwater stone to stabilize sheeting at mudline	Overall condition fair - no major issues. Safety ladders require attention.	100	20	FAIR	Replace broken safety ladders. Monitor other safety ladders and replace when required. Monitor the SSP checking for deformations and defects, with aim to replace at end of RUL. Consider replacement with SSP bulkhead of shorter wall height if wall will not serve as docking wall. A portion of this dockwall may need to be replaced due to planned expansion of the CDF.
LIQUID CARGO PIER	South Harbor Tract - East	PILE SUPPORTED DECK PIER	Liquid Cargo Handling	US Oil		1054		50		-27		1990 - Structural repairs	[Condition assessment for segment not complete. RUL provided is high level estimate based on knowledge of structure.]	75	25	GOOD	[Renewal plan for segment not complete]
DOCKWALL BETWEEN PIER 2 AND LIQUID CARGO PIER	South Harbor Tract - East	SSP DOCKWALL - TYPE E	Public Access	Public	1931	1393	588.1	50	538.1	-13.4	24	1991 - approx. 200' of Breakwater stone to stabilize sheeting at mudline	Overall condition fair - no major issues. Safety ladders require attention.	100	20	FAIR	Monitor safety ladders and replace when required. Monitor the SSP checking for deformations and defects, with aim to replace at end of RUL. Consider replacement with SSP bulkhead of shorter wall height if wall will not serve as docking wall.
PIER 2 SOUTH FACE DOCKWALL	South Harbor Tract - East	SSP DOCKWALL	Bulk Cargo	Kinder Morgan FMT	1958	1018	589	63	526	-27.43	39	Concrete apron replaced in 1990s	Overall good condition - some minor areas of damage to wing fender and concrete cap observed. Timber fender at east corner is need repair.	100	40	GOOD	Perform detailed evaluation of Pier 2 SSP RUL by 2030 to refine timing for planned replacement. Dockwall is designed for 39 ft wall height. Ability to add additional 1-2 ft. of dredge depth without reinforcement or rehab is likely feasible - will require additional engineering evaluation to determine. Fender system may need to be replaced before dockwall.
PIER 2 EAST FACE DOCKWALL	South Harbor Tract - East	SSP DOCKWALL	Bulk Cargo	Kinder Morgan FMT	1958	583	589	63	526	-27.43	39	No specific renewals for eastern dockwall identified.	Overall good condition - steel and concrete curb in fair condition. Multiple areas of pavement behind dockwall is damaged or detiorating.	100	40	GOOD	Same renewal approach as Pier 2 North/South Face Dockwalls. East face is outfitted with rubber fender and steel/concrete pile cap/curb assembly. Continued use of east face for docking should be evaluated which will factor into replacement of the east dockwall and fenders.
PIER 2 NORTH FACE DOCKWALL	South Harbor Tract - East	SSP DOCKWALL	Bulk Cargo	Kinder Morgan FMT	1958	991	589	63	526	-27.43	39	Concrete apron replaced in 1990s	Overall good condition - some minor areas of damage to wing fender and concrete cap observed. Timber fender at east corner is need of repair.	100	40	GOOD	Same renewal approach as Pier 2 South Face Dockwall.
SLIP 2 WEST FACE DOCKWALL	South Harbor Tract - East	SSP DOCKWALL - TYPE E	Bulk Cargo	Kinder Morgan FMT	1932	353	588.1	50	538.1	-13.4	24	None identified.	No major issues observed. 1930s pile section in similar condition as Pier 1. Timber barrier wall for wave runup mitigation at SW corner of slip is in good condition. May be missing some timber on south face.	100	30	GOOD	Plan for replacement at end fo useful life. A replacement wall may be able to be shorter and less costly if planned operations at the end of the slip facilitate it. Considerations for enhancing or expanding wave protection should be incorporated into the wall replacement.
PIER 1 SOUTH FACE DOCKWALL	South Harbor Tract - East	SSP DOCKWALL - TYPE B	Bulk Cargo	FMT	1932	980	588.6	56	532.6	-25.4	36	Pier 1 1990s - Apron pavement	Overall SSP in good condition given age (1930s). One segment had change in SSP segment indicating later dockwall replacement. South face appears to exhibit better durability for trapezoidal rubber fenders, possibly due to difference in ship use. None missing. Wing fender damaged/missing in several locations - similar to North face.	100	30	GOOD	Same renewal approach as Pier 1 North Face Dockwall.
PIER 1 EAST FACE DOCKWALL	South Harbor Tract - East	SSP DOCKWALL - TYPE D	Bulk Cargo	FMT	1932	347	588.1	56	532.1	-25.4	36	No specific renewals for eastern dockwall identified.	Overall good condition - Multiple areas of pavement behind dockwall is damaged, sinking, or detiorating. Some damage to top of interior concrete dockwall structure observed. Fender system completely missing - assume dockwall not used for mooring vessels.	100	30	GOOD	Same renewal approach as Pier 1 North/South Face Dockwalls. Use of east face for docking should be evaluated which will factor into replacement of the east dockwall and fenders.

CONDITION AND RENEWAL SUMMARY
DOCKWALLS

DOCKWALL ASSET NAME	TRACT	ASSET TYPE	CURRENT USAGE	SECTION-SPECIFIC STAKEHOLDER(S)	YEAR CONSTRUCTED	HORIZONTAL LENGTH (FT)	TOP OF WALL ELEVATION (FT, IGLD 85)	SSP LENGTH (FT)	BOTTOM OF WALL (TIP) ELEVATION (FT, IGLD 85)	DESIGN DRAFT (FT, LWD, IGLD 85)	DESIGN WALL HEIGHT (FT)	LAST MAJOR RENEWAL	CONDITION SUMMARY (2021)	EST. UL (Years)	EST. RUL (Years)	CONDITION RATING	RENEWAL APPROACH SUMMARY
PIER 1 NORTH FACE DOCKWALL	South Harbor Tract - East	SSP DOCKWALL - TYPE B	Bulk Cargo	FMT	1932	963	590.1	56	534.1	-25.4	36	Pier 1 1990s - Apron pavement	1930s SSP in relatively good condition for age and use. Several locations of missing and damaged wing fender. Several locations with missing trapezoidal fender. A couple locations of the concrete cap showed significant cracks at the expansion joints. Evidence of multiple concrete repairs observed.	100	30	GOOD	Perform detailed evaluation of Pier 1 SSP RUL by 2030 to refine timing for planned replacement. Dockwall is designed for 36 ft wall height. Ability to add additional 1-2 ft. of dredge depth without reinforcement or rehab is likely not feasible without reinforcing - will require additional engineering evaluation to determine. Look to hold out on replacement of fenders with dockwall replacement.
SLIP 1 WEST FACE DOCKWALL	South Harbor Tract - East	SSP DOCKWALL - TYPE C	Bulk Cargo	FMT	1932	295	588.1	56	532.1	-22.4	33	None identified.	1930s SSP in relatively good condition for age and use. Crumpling of pile tops are observed more frequently on this dockwall. Some newer segments of SSP wall identified. Timber barrier wall for wave runup mitigation at SW corner of slip is missing timbers and has damaged timbers.	100	30	GOOD	Plan for replacement at end fo useful life. A replacement wall may be able to be shorter and less costly if planned operations at the end of the slip facilitate it. Considerations for enhancing or expanding wave protection should be incorporated into the wall replacement.
TERMINAL 1 DOCKWALL	South Harbor Tract - East	SSP DOCKWALL - TYPE B	Bulk Cargo	FMT MMSD	1932	950	588.1	56	532.1	-25.4	36	1990 - Asphalt apron	Original 1930s portion of wall (~950ft) shows signs of its advanced age. Many location of severe corrosion of the sheeting observed throughout. The cause of this piles faster deterioration than that of the pile around Slip 1 and Pier 1 is unclear - may be due to bulk salt handling on Terminal 1.	100	20	FAIR	Begin long-term process for planning replacing 1930s SSP dockwalls starting with the segment along Terminal 1. Replacement options can consider placement of new anchor wall forward of existing.
MMSD EAST FACE DOCKWALL	South Harbor Tract - East	SSP BULKHEAD	MMSD Plant	MMSD	1985	735							[Condition assessment for segment not complete. RUL provided is high level estimate based on knowledge of structure.]	100	50	GOOD	[Renewal plan for segment not complete]
MOORING BASIN EAST FACE DOCKWALL	South Harbor Tract - West	SSP DOCKWALL		Cargill Salt The DeLong Company Kinder Morgan		2878							[Condition assessment for segment not complete. RUL provided is high level estimate based on knowledge of structure.]	100	20	FAIR	[Renewal plan for segment not complete]
MOORING BASIN WEST FACE DOCKWALL	South Harbor Tract - West	SSP DOCKWALL	Tenant use / vessel docking.	St. Mary's Cement	1947	992	585.1	56	529.1	-22.4	30	Noted in Infrastructure Report: SSP needs monitoring due to poor soil condition.	SSP in good condition. Steel pile cap, fenders, and mooring cleats require repairs.	100	35	GOOD	Monitor the SSP checking for deformations and defects, with aim to replace at end of RUL. Plan for upgrade of fender system that will need to be salvaged and reinstalled with new SSP dockwall.
LAFARGE DOCKWALL	South Harbor Tract - West	SSP DOCKWALL		LaFarge/Holcim	1947 1959	622		26					[Condition assessment for segment not complete. RUL provided is high level estimate based on knowledge of structure.]	100	30	GOOD	[Renewal plan for segment not complete]
CHLD SOUTH DOCKWALL / SMALL BOAT SLIP SEGMENT	South Harbor Tract - West	SSP DOCKWALL	Limited small vessel docking	Port/Great Lakes Towing	1948	150	583.5	26-46	557.5-537.5	Design draft not identified.	Not determined.	Not identified.	Dockwall in good approaching fair condition - no signs of movement, woody vegetation growing adjacent to dockwall observed on east end of slip. Recommend clearing maintenance. Sink hole on SE corner of slip associated with storm outfall observed. Recommend repair.	100	35	GOOD	Monitor the SSP checking for deformations and defects, with aim to replace at end of RUL. Consider closing off and filling slip if no long term use planned.
CHLD SOUTH DOCKWALL / 264 FT SEGMENT NORTH OF SMALL BOAT SLIP	South Harbor Tract - West	SSP DOCKWALL	Tenant use / vessel docking.	Port/All Tenants	1948	264	583.5	50	533.5	-18.4	24.5	Not identified.	Dockwall in good approaching fair condition - no signs of movement. Dockwall height is low (approx. elev. 583.5) - signs of flooding behind wall observed, particularly on north end, due to recent high lake levels.	100	35	GOOD	Monitor the SSP checking for deformations and defects, with aim to replace at end of RUL. Future replacements/rehabs should consider increasing height of wall and top of wall elevations.
CHLD NORTH DOCKWALL / 1,193 FT PRIMARY SEGMENT OF CHLD	South Harbor Tract - West	SSP DOCKWALL		Port/All Tenants	1938	1193	583.5	50	533.5	-22.4	28.4	1988 - Repair Dock Bulge 1984 - Dockwall Rehab	Dockwall in good approaching fair condition - no signs of movement. Top of concrete dock behind SSP has minor cracks throughout. Areas of minor separation of SSP from concrete observed. Much of dockwall face unable to be inspected due to presence of vessel at dock.	100	25	GOOD	Monitor the SSP checking for deformations and defects, with aim to replace at end of RUL. Future replacements/rehabs should consider increasing height of wall and top of wall elevations.
CHLD NORTH DOCKWALL / 215 FT SEGMENT AT NORTH END OF CHLD	South Harbor Tract - West	SSP DOCKWALL		Port/All Tenants	1958	215	583.5	50	533.5	-23.9	29.9	Not identified.	Dockwall in good approaching fair condition - no signs of movement. Areas of damage to top of pile observed (cracks/bending). Top of dockwall elevation relatively low. Area behind dockwall on north end low and susceptible to flooding during high lake level conditions.	100	35	GOOD	Monitor the SSP checking for deformations and defects, with aim to replace at end of RUL. Future replacements/rehabs should consider increasing height of wall and top of wall elevations.
CELLULAR DOCKWALL NORTH OF CHLD	South Harbor Tract - West	CELLULAR SSP DOCKWALL		Kinder Morgan		444							[Condition assessment for segment not complete. RUL provided is high level estimate based on knowledge of structure.]	100	30	GOOD	[Renewal plan for segment not complete]
GRAND TRUCK NORTH CHANNEL BANK	South Harbor Tract - West	REVETMENT				684							[Condition assessment for segment not complete. RUL provided is high level estimate based on knowledge of structure.]	10	0	DEFICIENT	[Renewal plan for segment not complete]
GREENFIELD DOCKWALL	South Harbor Tract - West	SSP DOCKWALL				827							[Condition assessment for segment not complete. RUL provided is high level estimate based on knowledge of structure.]	100	50	GOOD	[Renewal plan for segment not complete]
DOCKWALL BETWEEN STATE PARK AND FEDERAL PIER	North Harbor Tract	SSP BULKHEAD	Public Access, Limited Vessel Docking	Henry Maier Festival Grounds / Public / State	1956	1150	585.6	50	535.6	-20.4	28.5	None identified.	Overall good condition. Records indicate SSP and tierods in contact with corrosive fill soils are coated. No evidence of excessive corrosion observed. Coated tube steel rail in fair-good condition.	100	25	GOOD	Monitor the SSP checking for deformations and defects, with aim to replace at end of RUL. Consider replacement with SSP bulkhead of shorter wall height if wall will not serve as docking wall. Tube steel railing will likely need to be rehabilitated before end of dockwall RUL.

CONDITION AND RENEWAL SUMMARY
DOCKWALLS

DOCKWALL ASSET NAME	TRACT	ASSET TYPE	CURRENT USAGE	SECTION-SPECIFIC STAKEHOLDER(S)	YEAR CONSTRUCTED	HORIZONTAL LENGTH (FT)	TOP OF WALL ELEVATION (FT, IGLD 85)	SSP LENGTH (FT)	BOTTOM OF WALL (TIP) ELEVATION (FT, IGLD 85)	DESIGN DRAFT (FT, LWD, IGLD 85)	DESIGN WALL HEIGHT (FT)	LAST MAJOR RENEWAL	CONDITION SUMMARY (2021)	EST. UL (Years)	EST. RUL (Years)	CONDITION RATING	RENEWAL APPROACH SUMMARY
QUIET WATER BASIN SOUTH FACE DOCKWALL	North Harbor Tract	SSP BULKHEAD	Public Access	Henry Maier Festival Grounds / Public / State	1956	366	585.6	50	535.6	-20.4	28.5	None identified.	Overall good condition. Records indicate SSP and tierods in contact with corrosive fill soils are coated. No evidence of excessive corrosion observed. Concrete pile cap in good condition. Stainless steel rail mounted to pile cap in excellent condition.	100	25	GOOD	Monitor the SSP checking for deformations and defects, with aim to replace at end of RUL. Consider replacement with SSP bulkhead of shorter wall height if wall will not serve as docking wall. Reinforced concrete cap can likely make it to dockwall full replacement provided it is adequately maintained (grouted/sealed).
QUIET WATER BASIN WEST FACE REVETMENT	North Harbor Tract	STONE REVETMENT	Public Access	Henry Maier Festival Grounds / Public / State	--	1922	~584-589	NA	NA	NA	NA	None identified.	Stone revetment in good condition. Stone moderately weathered. Revetment stone size originally designed for harbor wave conditions that existed prior to construction of Lake Shore State Park peninsula which provides additional protection. Some areas of the revetment show signs of settlement and movement of stone but overall still functional. Crest height of revetment ranges from 584 to 589 with the higher crest height found in the northern 320 ft. section.	100	50	GOOD	Limestone is weathered but has sufficient lifespan remaining to be reworked for rehabilitation of revetement in the future when needed. Since the shoreline is protected within the quiet water basin, the stone size and gradation required for protection can likely be served through reworking the existing stone with minor supplementation for the filter layer (geotextile or aggregate). The renewal approach should include reworking the revetment section in segments as needed.
PIER WISCONSIN RUBBLE MOUND	North Harbor Tract	RUBBLE MOUND AND CONCRETE DECK	Cruise Vessel Docking / Public Access	Discovery World / Public / State	2004 or 2005	1207	588.1	45	543.1	-18.9	30	None identified.	Pier Wisconsin is in excellent condition due to its relatively young age. A couple minor issues are noted in the inspection report related to settlement of concrete and corrosion at welded joints. Overall, the structure will require minor renewal over the next decades.	100	75	EXCELLENT	Due to current age and condition of Pier Wisconsin, major renewals for concrete, stone, and steel components have not been planned through year 2070. Replacement of rubber fenders at end of useful life is planned. Rehabilitation of the concrete roadway, curbs, and steel catwalks should be monitored and included in the renewal plan worksheet in later updates when deterioration rates of these components become more apparent.
HARBOR HOUSE DOCKWALL	North Harbor Tract	SSP BULKHEAD	Harbor House Restaurant and Parking	The Bartolotta Restaurants	1956	530	585.6	45	540.6	-18.43	26.5	None identified.	Overall good condition. Some moderate weathering of steel observed. Wall has steel plates mounted at top of wall face, some of which are damaged or loose. Maintenance to remove or secure recommended. Coated tube steel rail in fair condition. Clean and recoat maintenance recommended.	100	25	GOOD	Monitor the SSP checking for deformations and defects, with aim to replace at end of RUL. Consider replacement with SSP bulkhead of shorter wall height if wall will continue non-docking service. Tube steel railing will likely need to be rehabilitated before end of dockwall RUL.
ART MUSEUM REVETMENT	North Harbor Tract	STONE REVETMENT AND PILE SUPPORTED WALKWAY DECK	Art Museum Oak Leaf Trail	Milwaukee Art Museum	--	476	589	--	--	--	--	Concrete fill project completed in 2020 on west side of walkway to repair erosional issue from wave activity undermining the walkway.	Stone revetment and walkway in good condition. Limestone shows signs of weathering and is not uniform in its location under walkway. Some rework/supplement of stone may be required in the future. Concrete walkway in good condition. Some signs of corrosion staining and spawling on exposed eastern edge of concrete observed. Preventative repairs recommended.	100	30	GOOD	Monitor configuration of stone revetment and rework/supplement as necessary to provide protection from direct wave action under the walkway. Eastern edge of walkway has corrosion staining, spawling, and cracking indicating potential exposure of the rebar. A preventative maintenance project is recommended to repair and protect the eastern edge of the concrete from continued deterioration.
ART MUSEUM RUBBLE MOUND BREAKWATER	North Harbor Tract	RUBBLE MOUND BREAKWATER	Art Museum wave protection	Milwaukee Art Museum	--	335	--	NA	NA	NA	NA	None identified.	Breakwater is in excellent condition due to its relatively young age.	100	75	EXCELLENT	No major renewal activities planned for next 50-year period due to the current age and nature of the structure.

CONDITION AND RENEWAL SUMMARY
NAVIGATIONAL AREAS

NAVIGATIONAL AREA ASSET NAME	TRACT	AREA (ACRES)	MINIMUM DREDGE DEPTH (FEET)	ASSUMED CURRENT CONDITION	RENEWAL APPROACH SUMMARY
PIER WISCONSIN	North Harbor Tract	24.24	17	Functional	Perform maintenance dredging as necessary to maintain navigational depth requirements.
MARITIME BASIN & ENTRANCE	North Harbor Tract	12.86	17	Functional	Perform maintenance dredging as necessary to maintain navigational depth requirements.
SLIP 1	South Harbor Tract	5.29	27	Functional	Perform maintenance dredging as necessary to maintain navigational depth requirements.
SLIP 2	South Harbor Tract	6.55	27	Functional	Perform maintenance dredging as necessary to maintain navigational depth requirements.
SLIP 3	South Harbor Tract	7.38	27	Functional	Perform maintenance dredging as necessary to maintain navigational depth requirements.
LIQUID CARGO PIER	South Harbor Tract	15.3	27	Functional	Perform maintenance dredging as necessary to maintain navigational depth requirements.
SOUTH SHORE CRUISE DOCK / LAKE EXPRESS CAR FERRY	South Harbor Tract	20.54	17	Functional	Perform maintenance dredging as necessary to maintain navigational depth requirements.
CITY HEAVY LIFT DOCK	South Harbor Tract	2.08	27	Functional	Perform maintenance dredging as necessary to maintain navigational depth requirements.
MUNICIPAL MOORING BASIN	South Harbor Tract	33.31	27	Functional	Perform maintenance dredging as necessary to maintain navigational depth requirements.
GREENFIELD DOCK	South Harbor Tract	1.43	27	Functional	Perform maintenance dredging as necessary to maintain navigational depth requirements.
GRAND TRUNK SLIP	South Harbor Tract	2.7	17	Functional	Perform maintenance dredging as necessary to maintain navigational depth requirements.

CONDITION AND RENEWAL SUMMARY
FENCING

ASSET NAME	LOCATION DESCRIPTION	FENCE DESCRIPTION	EST. LENGTH (FT)	GATES	EST. RUL (Years)	CONDITION RATING	CONDITION SUMMARY / NOTES	RENEWAL APPROACH SUMMARY
SEA SCOUTS PERIMETER FENCE	Perimeter fence around parcel.	CHAIN LINK, 6 & 8-FT, 3-WIRE BARB	784.3389	1 SLIDE GATE, 3 SWING GATE	15	GOOD	There is some damage to the to slide gate at the drive entrance.	Replace gate, repair as needed and replace at end of useful life.
RUSSELL AVE PIER ACCESS WALKWAY FENCE	Fence line is separated into two sections, one at the entrance and one at the pier.	CHAIN LINK, 6 & 8-FT, 3-WIRE BARB	132.3028	1 PERSON GATE	20	GOOD	No major issues observed.	Replace fence at end of useful life.
LAKE EXPRESS TERMINAL BUILDING PERIMETER FENCE	Fencing that separates the secured areas of the car ferry loading operations.	STEEL PICKET, 6-FT, SECURITY	713.1854	4 SLIDE GATE	25	EXCELLENT	No major issues observed.	Replace fence at end of useful life.
SOUTH SHORE CRUISE DOCK WEST FENCE	Short portion of chain link fencing separating Lake Express parcel from South Shore Cruise Dock parcel.	CHAIN LINK, 8 FT	166.6298	1 SWING GATE, 1 PERSON GATE	15	GOOD	There is some damage to the person gate and swing gate. The northern end of the fence is highly vegetated. Overall, the fence is in good condition.	Replace gate, repair as needed and replace at end of useful life.
LAKE EXPRESS / SOUTH SHORE CRUISE DOCK NORTH FENCE	Long fence line along north side of Lake Express and South Shore Cruise Dock parcels between CDF and Lake Express / South Shore Cruise Dock.	CHAIN LINK, 8 FT	1496.5894	1 SWING GATE	15	GOOD	The fence has no top rail or security wire. Some portions of the fence are highly vegetated. There are signs of recent mowing of vegetation along the fence. Overall, the fence is in good condition. Regular clearing adjacent to fence is required.	Repair fence and remove vegetation as needed. Replace fence at end of useful life.
CDF WEST FENCE LINE - S SEGMENT	Southern portion of west fence line along CDF that is black picket style.	STEEL PICKET, 6-FT, SECURITY	1026.0326	2 SLIDE GATE, 1 PERSON GATE	15	GOOD	Some portions of the fence are highly vegetated. There are signs of recent mowing of vegetation along the fence. Overall, the fence is in good condition. Regular clearing adjacent to the fence is required.	Repair fence and remove vegetation as needed. Replace fence at end of useful life.
CDF WEST FENCE LINE - N SEGMENT	Northern portion of west fence line along CDF that is chain link.	CHAIN LINK, 6 FT	862.8295	1 SWING GATE	15	GOOD	The fence has no top rail or security wire. Some portions of the fence are highly vegetated. There are signs of recent mowing of vegetation along the fence. There is some damage to the swing gate. Overall, the fence is in good condition. Regular clearing adjacent to the fence is required.	Repair fence and remove vegetation as needed. Replace fence at end of useful life.
PORT ADMINISTRATION BUILDING STEEL PICKET PERIMETER FENCE	East portion of perimeter fence constructed of decorative steel picket fence.	STEEL PICKET, 8-FT, SECURITY	726.6327	3 SLIDE GATE, 2 PERSON GATE	25	EXCELLENT	No major issues observed.	Replace fence at end of useful life.
PORT ADMINISTRATION BUILDING CHAIN LINK PERIMETER FENCE	West portion of perimeter fence constructed of chain link.	CHAIN LINK, 6 FT	905.8121	NONE	15	GOOD	Some sections of the fence are deformed near the maintenance garage entrance. High degree of vegetation on the outer portion of the fence. Regular clearing adjacent to the fence is required.	Repair fence and remove vegetation as needed. Replace fence at end of useful life.
S. LINCOLN MEMORIAL DR EAST FENCE	Fence line on east side of S. Lincoln Memorial Dr. from port entrance gate to Terminal 1 entrance at MMSD. Fence line is separated in many locations at the elevated highway piers.	CHAIN LINK, 8-FT, 3-WIRE BARB	5832.2034	7 SLIDE GATE, 9 SWING GATE, 5 PERSON GATE	10	FAIR	Different segments of the fence have different age and condition. Some segments contain damaged and bent posts. The barbed wire is falling off the fence in some segments. The fence is new with few problems near the Kinder Morgan facilities.	Repair fence as needed, replace at end of useful life.
S. LINCOLN MEMORIAL DR SALT PILE FENCE	Fence line at the end of S. Lincoln Memorial Drive near the boundary between the port and the MMWD. The fence is different than the rest of the fencing along S. Lincoln Memorial Drive.	CHAIN LINK, 6-FT, 3-WIRE BARB	77.6934	1 SWING GATE	10	FAIR	There is evidence of significant corrosion of the fence. The barbed wire is falling off the fence.	Repair fence as needed, replace at end of useful life.
S. HARBOR DR WEST FENCE	Fence line on west side of S. Harbor Drive from the northwest boundary of the port to the swing gate near N. Access Road where an older type of fencing begins	CHAIN LINK, 8-FT, 3-WIRE BARB	2388.0327	1 SLIDE GATE, 2 SWING GATE	15	GOOD	The barbed wire is falling off the fence in some segments. Overall the fence is in good condition.	Repair fence as needed, replace at end of useful life.
SE CORNER OF S. HARBOR DR AND N. ACCESS RD SEGMENT	Short segment of fence on the southeast corner of Harbor and N. Access Road, near the Federal Marine Terminals perimeter fence	CHAIN LINK, 6-FT	10.7946	NONE	0	DEFICIENT	The fence is unattached and there is evidence of significant corrosion. The fence segment serves no apparent purpose.	Repair fence as needed, replace at end of useful life.
S. HARBOR DR EAST FENCE SEGMENT 1	Fence line from the point where the fencing type changes and the railroad tracks veer to the right to enter the Federal Marine Terminals property to the northern vehicle entrance to the U.S. Oil property.	CHAIN LINK, 4-FT, 3-WIRE BARB	268.5734	1 SLIDE GATE, 1 PERSON GATE	20	GOOD	There is evidence of significant corrosion of the fence. The fence poles are bent in several locations along the fence line.	Repair fence as needed, replace at end of useful life.
U.S. OIL NORTH FENCE	Fence line along the north end of the U.S. oil facility from the northern entrance to the property to the intersection point with the U.S. Oil pond perimeter fence line.	CHAIN LINK, 6-FT, 3-WIRE BARB	646.4977	1 SLIDE GATE, 1 SWING GATE, 1 PERSON GATE	10	FAIR	No major issues observed.	Replace fence at end of useful life.
S. HARBOR DR EAST FENCE SEGMENT 2	Fence line along S. Harbor Drive on the east side of the U.S. oil facility until the northern entrance area near the end of the train tracks	CHAIN LINK, 6-FT, 3-WIRE BARB	255.9943	NONE	10	FAIR	There is evidence of significant corrosion of the fence. The fence poles are bent in some locations along the fence line.	Repair fence as needed, replace at end of useful life.
U.S. OIL EAST FENCE	Fence line extending from the northernmost small brick building near the U.S. Oil parking lot to a telephone pole on the east side of S. Harbor Drive where the fencing type changes	CHAIN LINK, 6-FT, 3-WIRE BARB	674.4575	1 SLIDE GATE, 2 SWING GATE	10	FAIR	There is evidence of significant corrosion of the fence. The fence poles are bent and the fencing is detached from the poles in some locations along the fence line.	Repair fence as needed, replace at end of useful life.
S. LINCOLN MEMORIAL DR WEST FENCE SEGMENT 1	Fence line on the west side of S. Lincoln Memorial Drive from the intersection point with the Federal Marine Terminals perimeter fence line to the intersection point with the U.S. Oil Pond perimeter fence line.	CHAIN LINK, 4-FT, 3-WIRE BARB	500.7625	1 SWING GATE, 1 PERSON GATE	5	FAIR	Some portions of the fence are highly vegetated. There is evidence of significant corrosion of the fence. The fence poles are bent in some locations along the fence line. The barbed wire is falling off the fence in some segments.	Repair fence as needed, replace at end of useful life.
U.S. OIL POND PERIMETER FENCE	Fence line surrounding a pond northeast of the U.S. Oil facility.	CHAIN LINK, 6-FT, 3-WIRE BARB	854.0169	1 PERSON GATE	15	GOOD	Some portions of the fence are highly vegetated. Overall, the fence is in good condition.	Repair fence and remove vegetation as needed. Replace fence at end of useful life.
NW CORNER OF S. LINCOLN MEMORIAL DR AND S. ACCESS RD PERIMETER FENCE	Triangular perimeter fence line at the northwest corner of the intersection of S. Lincoln Memorial Drive and S. Access Road.	CHAIN LINK, 6-FT, 3-WIRE BARB	695.1924	1 SWING GATE, 1 PERSON GATE	10	FAIR	The fence poles are bent in some locations along the fence line. Some segments of the fence are tilting over slightly.	Repair fence as needed, replace at end of useful life.

CONDITION AND RENEWAL SUMMARY
FENCING

ASSET NAME	LOCATION DESCRIPTION	FENCE DESCRIPTION	EST. LENGTH (FT)	GATES	EST. RUL (Years)	CONDITION RATING	CONDITION SUMMARY / NOTES	RENEWAL APPROACH SUMMARY
U.S. OIL SOUTH FENCE	Fence line from the southeast corner of the cement wall surrounding U.S. Oil to the southernmost small brick building near the U.S. Oil parking lot.	CHAIN LINK, 6-FT, 3-WIRE BARB	697.0499	1 SLIDE GATE, 3 SWING GATE	10	FAIR	Different segments of the fence have different age and condition. Most of the fence is older and there is significant evidence of corrosion of the fence.	Repair fence as needed, replace at end of useful life.
U.S. OIL PARKING LOT FENCE	Fence line in between the two small brick U.S. oil buildings near the parking lot.	CHAIN LINK, 6-FT, 3-WIRE BARB	48.6375	1 PERSON GATE	20	GOOD	No major issues observed.	Replace fence at end of useful life.
BULK TERMINAL FACILITY PERIMETER FENCE	Fence line surrounding the northern, northeastern, and northwestern portions of the Bulk Terminal Facility property. Fence line is separated into three sections due to a railroad crossing and a section of broken fence.	CHAIN LINK, 6-FT, 3-WIRE BARB	1670.925	1 PERSON GATE, 1 SLIDE GATE, 3 SWING GATE	0	DEFICIENT	There is evidence of significant corrosion of the fence. The fence poles are bent and the fencing is detached from the poles in some locations along the fence line. The barbed wire is falling off the fence in some segments. Some segments of the fence are falling over.	Repair fence as needed, replace at end of useful life.
SUB LAKE FWY FENCE - N SEGMENT	Short segment of fence beneath the Lake Fwy between two highway piers.	CHAIN LINK, 8-FT, 3-WIRE BARB	116.538	1 SWING	15	GOOD	No major issues observed.	Replace fence at end of useful life.
SUB LAKE FWY FENCE - S SEGMENT	Short segment of fence beneath the Lake Fwy between two highway piers.	CHAIN LINK, 8-FT, 3-WIRE BARB	118.8288	1 SWING	0	DEFICIENT	The fence poles are bent in some segments.	Repair fence as needed, replace at end of useful life.
FEDERAL MARINE TERMINALS PERIMETER FENCE	Fence line surrounding the Bradford #1 Building, Bradford #2 Building, and the Terminal #5 Building. Fence line is separated into two sections, one on the west side and one surrounding the north, east, and south sides. Small section of fence line extends southwest along the railroad.	CHAIN LINK, 6-FT, 3-WIRE BARB	2251.4205	7 SLIDE GATE	0	DEFICIENT	There is evidence of significant corrosion of the fence. The fence poles are bent and the fencing is detached from the poles in some locations along the fence line. The barbed wire is falling off the fence in some segments. Some segments of the fence are falling over. Some portions of the fence are highly vegetated.	Repair fence and remove vegetation as needed. Replace fence at end of useful life.
COMPASS MINERALS PERIMETER FENCE LINE	Fence line surrounding the Compass Minerals building	CHAIN LINK, 8-FT, 3-WIRE BARB	917.9235	3 SWING GATE	20	GOOD	No major issues observed.	Replace fence at end of useful life.
S. CARFERRY DR EAST FENCE LINE SEGMENT 1	Fence line from the swing gate near N. Access Road where an older type of fencing begins to the western edge of the port near Kaszube's Park.	CHAIN LINK, 8-FT, 3-WIRE BARB	872.5637	2 SLIDE GATE	15	GOOD	The fence poles are bent in some locations along the fence line. Some portions of the fence are highly vegetated.	Repair fence and remove vegetation as needed. Replace fence at end of useful life.
LAFARGE ACCESS GATE	Fence line from the Lafarge Maintenance Building to the intersection point with the S. Carferry Drive East Fence Line Segment	CHAIN LINK, 6-FT	51.6508	1 SWING GATE	20	GOOD	No major issues observed.	Replace fence at end of useful life.
WEST PORT FENCE	Fence line on the west side of the port in between Kaszube's Park and the water, just north of Lafarge Access Gate. Fence line is separated into two sections, a small segment south of the small building and a larger segment north of the small building.	CHAIN LINK, 6-FT, 3-WIRE BARB	239.2851	3 SWING GATE	10	FAIR	There is evidence of significant corrosion of the fence. The barbed wire is falling off the fence in some segments. Some portions of the fence are highly vegetated.	Repair fence and remove vegetation as needed. Replace fence at end of useful life.
CARGILL SALT FENCE 1	Fence surrounding bags of salt outside of the northern side of the Cargill Salt building	CHAIN LINK, 8-FT	174.0088	2 SWING GATE	15	GOOD	There is evidence of moderate corrosion of the fence. Otherwise, the fence is in good condition.	Repair fence as needed, replace at end of useful life.
CARGILL SALT FENCE 2	Fence surrounding bags of salt outside of the southern side of the Cargill Salt building	CHAIN LINK, 8-FT	154.212	2 SWING GATE	15	GOOD	There is evidence of moderate corrosion of the fence. Otherwise, the fence is in good condition.	Repair fence as needed, replace at end of useful life.
CARGILL SALT FENCE 3	Fence surrounding bags of salt and wooden pallets to the south of the Cargill Salt building	CHAIN LINK, 6-FT, 3-WIRE BARB	384.2149	2 SWING GATE	20	GOOD	No major issues observed.	Replace fence at end of useful life.
ST. MARY'S PROCESSING BUILDING PERIMETER FENCE	Fence line surrounding St. Mary's processing and office buildings	CHAIN LINK, 6-FT, 3-WIRE BARB	648.3602	2 SLIDE GATE, 1 SWING GATE	15	GOOD	There is one section where the fence is slightly dented and the barbed wire is detached. Otherwise, the fence is in good condition.	Repair fence as needed, replace at end of useful life.
ST. MARY'S WAREHOUSE BUILDING SOUTH FENCE	Fence line outside of the southern end of St. Mary's warehouse building	CHAIN LINK, 6-FT, 3-WIRE BARB	199.956	2 SWING GATE, 1 PERSON GATE	20	GOOD	Some portions of the fence are highly vegetated. Otherwise, the fence is in good condition	Repair fence and remove vegetation as needed. Replace fence at end of useful life.
ST. MARY'S WAREHOUSE BUILDING NORTH FENCE	Fence line outside of the northern end of St. Mary's warehouse building	CHAIN LINK, 6-FT, 3-WIRE BARB	923.9948	4 SWING GATE	20	GOOD	Some portions of the fence are highly vegetated. Otherwise, the fence is in good condition	Repair fence and remove vegetation as needed. Replace fence at end of useful life.
SW CORNER OF E. BAY ST AND S. CARFERRY DR PERIMETER FENCE	Fence line surrounding several exposed pipes.	CHAIN LINK, 6-FT, 3-WIRE BARB	285.8782	1 SWING GATE	20	GOOD	No major issues observed.	Replace fence at end of useful life.
LIQUID CARGO PIER FENCE	Fence line underneath the Lake Fwy near the Liquid Cargo Pier. Fence is separated into three segments, one on the north end of the pier surrounding several pipes, one creating a north-south barrier to the pier, and one creating an east-west barrier between two highway piers.	CHAIN LINK, 6-FT, 3-WIRE BARB	233.6279	1 SLIDE GATE, 1 SWING GATE	20	GOOD	No major issues observed.	Replace fence at end of useful life.
SE CORNER OF E. BAY ST AND S. HARBOR DR FENCE - NW SEGMENT	Fence line surrounding the northwest portion of the lot on the southeast corner of the intersection of Bay and Harbor. Fence line is separated due to a large gap on the east side of S. Harbor Drive. Small segment of fence on a southeast angle on the east side of S. Harbor Drive.	CHAIN LINK, 6-FT, 3-WIRE BARB	1297.5081	1 SLIDE GATE, 2 SWING GATE	20	GOOD	No major issues observed.	Replace fence at end of useful life.
POLE BUILDINGS PERIMETER FENCE	Fence line surrounding Pole Building #1 and Pole Building #2.	CHAIN LINK, 6-FT, 3-WIRE BARB	1882.9831	1 SLIDE GATE, 1 SWING GATE	10	FAIR	There is evidence of significant corrosion of the gate. The gate is also slightly tilting over. Otherwise, the fence is in good condition.	Replace gate, repair as needed and replace at end of useful life.
PORTLAND TRUCKING PERIMETER FENCE	Fence line surrounding the Portland Trucking Facility, from the north end of the brick building around the lot to the south end of the brick building.	CHAIN LINK, 6-FT, 3-WIRE BARB	1995.0912	3 SWING GATE	10	FAIR	There is evidence of significant corrosion of the gate. The gate is also slightly bent. Otherwise, the fence is in good condition.	Replace gate, repair as needed and replace at end of useful life.
S. LINCOLN MEMORIAL DRIVE WEST FENCE SEGMENT 3	Fence line on the west side of S. Lincoln Memorial Drive east of the lot where Pole Building #1 and Pole Building #2 are located.	CHAIN LINK, 6-FT, 3-WIRE BARB	211.4999	NONE	15	GOOD	There is evidence of moderate corrosion of the gate. Some portions of the fence are highly vegetated.	Repair fence and remove vegetation as needed. Replace fence at end of useful life.

CONDITION AND RENEWAL SUMMARY
FENCING

ASSET NAME	LOCATION DESCRIPTION	FENCE DESCRIPTION	EST. LENGTH (FT)	GATES	EST. RUL (Years)	CONDITION RATING	CONDITION SUMMARY / NOTES	RENEWAL APPROACH SUMMARY
SE CORNER OF CARFERRY DR AND BAY ST PERIMETER FENCE - N SEGMENT	Fence line surrounding northernmost lot at the southeast corner of Carferry and Bay	CHAIN LINK, 6-FT, 3-WIRE BARB	1069.0844	1 SLIDE GATE, 1 SWING GATE	20	GOOD	No major issues observed.	Replace fence at end of useful life.
SE CORNER OF CARFERRY DR AND BAY ST PERIMETER FENCE - S SEGMENT	Fence line surrounding southernmost lot at the southeast corner of Carferry and Bay	CHAIN LINK, 6-FT, 3-WIRE BARB	892.3448	1 SWING GATE	5	FAIR	There is no barbed wire on some segments of the fence. There is evidence of significant corrosion of the fence.	
S. CARFERRY DR WEST FENCE SEGMENT	Fence line between the two lots on the southeast corner of S. Carferry Drive and E. Bay Street. Fence line is separated into two segments, one very short segment on the east side of S. Carferry Drive and a longer segment on the west side of S. Carferry Drive.	CHAIN LINK, 6-FT	98.1288	NONE	0	DEFICIENT	The fence is falling over and appears very dilapidated. The fence serves no apparent purpose.	Evaluate need and purpose of fence. Replace if necessary.
GRAND TRUNK PERIMETER FENCE	Fence line extending from near 1919 Marina Drive south along Marina Drive, east along the train tracks, north along the perimeter of the wooded area, and northwest along the train tracks to the Kinnikinic River.	CHAIN LINK, 6-FT, 3-WIRE BARB	4332.0403	3 SWING GATE	10	FAIR	The fence is highly vegetated. Some fence poles are bent.	Repair fence and remove vegetation as needed. Replace fence at end of useful life.
SE CORNER OF E. BAY ST AND S. HARBOR DR FENCE - NE SEGMENT	Fence line surrounding the northeast portion of the lot on the southeast corner of the intersection of Bay and Harbor.	CHAIN LINK, 6-FT	892.3448	1 SWING GATE	5	FAIR	There is some damage to the swing gate at the corner, including corrosion and bent poles.	Replace gate, repair as needed and replace at end of useful life.
S. LINCOLN MEMORIAL DRIVE WEST FENCE SEGMENT 2	Fence line on the west side of S. Lincoln Memorial Drive east of the lot where Pole Building #1 and Pole Building #2 are located. Intersects with "SE CORNER OF E. BAY ST AND S. HARBOR DR FENCE - NW SEGMENT" at the southernmost end and "SE CORNER OF E. BAY ST AND S. HARBOR DR FENCE - NE SEGMENT" at the northernmost end.	CHAIN LINK, 6-FT, 3-WIRE BARB	370.2093	NONE	15	GOOD	The fence is moderately vegetated. Otherwise, the fence is in good condition.	Repair fence and remove vegetation as needed. Replace fence at end of useful life.
SW CORNER OF S. LINCOLN MEMORIAL DR AND S. ACCESS RD FENCE	Fence line at the southwest corner of Lincoln Memorial Drive and S. Access Road surrounding white pipelines.	CHAIN LINK, 8-FT, 3-WIRE BARB	1946.5509	1 SWING GATE, 1 PERSON GATE	15	GOOD	Some portions of the fence are highly vegetated. There is evidence of moderate corrosion of the fence. Otherwise, the fence is in good condition.	Repair fence and remove vegetation as needed. Replace fence at end of useful life.
SE CORNER OF S. HARBOR DR AND S. ACCESS RD FENCE	Fence line at the southeast corner of S. Harbor Drive and S. Access Road surrounding lot with brick building and large metal drums north of the Bulk Terminals lot.	CHAIN LINK, 6 FT, 3-WIRE BARB	954.259	3 SLIDE GATE, 1 SWING GATE, 1 PERSON GATE	10	FAIR	There is evidence of significant corrosion of the fence. Otherwise, the fence is in good condition.	Replace fence at end of useful life.

CONDITION AND RENEWAL SUMMARY
GREEN INFRASTRUCTURE

ASSET ID	LOCATION	ASSET TYPE/CURRENT USAGE	AREA	CURRENT CONDITION	RENEWAL APPROACH SUMMARY (PORT MAINTENANCE REQUIREMENTS)
North Urban Park	North Harbor Tract	Open Park Space	2.5	Functional	Minor maintenance as requested by tenant.
Storm Water Management Facility	West of Terminal 4	Stormwater Detention Facility	0.88	Functional	Maintain in working condition. Monitor liner exposed on banks on at least on annual basis.
Lake Express Public Access	Adjacent to Lake Express Loading Area	Dockside Public Access	3.8	Functional	Minor maintenance as requested by tenant.
Grand Trunk Wetland Restoration	West of Mooring Basin on S. Marina Drive	Wetland Restoration Project with Future Public Access	9.6	Functional	Maintenance agreement to be determined with City DPW. Assume City of Milwaukee DPW will talk control of maintenance.

CONDITION AND RENEWAL SUMMARY
LIGHTING

ASSET ID	LOCATION	ASSET TYPE/ CURRENT USAGE	EST. UL (YEARS)	EST. RUL (YEARS)	CONDITION RATING	CONDITION NOTES	RENEWAL APPROACH SUMMARY
CHLD Light Pole #1	City Heavy Lift Dock	3 lights per pole	20	15	GOOD	Assumed to be in good working condition	Replace bulbs and poles as needed, potentially upgrade to LED
CHLD Light Pole #2	City Heavy Lift Dock	3 lights per pole	20	15	GOOD	Assumed to be in good working condition	Replace bulbs and poles as needed, potentially upgrade to LED
CHLD Light Pole #3	City Heavy Lift Dock	3 lights per pole	20	15	GOOD	Assumed to be in good working condition	Replace bulbs and poles as needed, potentially upgrade to LED
Intermodal Yard Light Pole #1	Intermodal Railyard	5-6 lights per pole	20	15	GOOD	Assumed to be in good working condition	Replace bulbs and poles as needed, potentially upgrade to LED
Intermodal Yard Light Pole #2	Intermodal Railyard	5-6 lights per pole	20	15	GOOD	Assumed to be in good working condition	Replace bulbs and poles as needed, potentially upgrade to LED
Intermodal Yard Light Pole #3	Intermodal Railyard	5-6 lights per pole	20	15	GOOD	Assumed to be in good working condition	Replace bulbs and poles as needed, potentially upgrade to LED
Intermodal Yard Light Pole #4	Intermodal Railyard	5-6 lights per pole	20	15	GOOD	Assumed to be in good working condition	Replace bulbs and poles as needed, potentially upgrade to LED

CONDITION AND RENEWAL SUMMARY
PAVEMENT

ASSET ID	ASSET TYPE	SEGMENT ID	SEGMENT DESCRIPTION	MATERIALS OF CONSTRUCTION	SEGMENT AREA (SF)	CONDITION SUMMARY (2021)	PASER SURFACE RATING	CONTION RATING	EST. UL (YEARS)	EST. RUL (YEARS)	WORK NEEDED	RENEWAL APPROACH SUMMARY	NOTES
High-Wide Route	Roadway			Concrete	7,900	Cracking and spalling.	3	Poor	25	0	Replace	Replace surface.	
South Harbor Dr Extended	Roadway			Asphalt	16,500	No signs of cracking or wear.	9	Excellent	30	30	None	None required. Eventually extend life by resurfacing.	
Lake Express Dr	Roadway			Asphalt	34,804	Some longitudinal cracks, evidence of sealing, some edge deterioration	5	Fair	30	10	Seal Coat	Look to provide full reconstruction of pavement and base at end of useful life. Consider drainage improvements	
Harbor-Bay Dr Access Road	Roadway			Asphalt	14,100	Some alligator cracking. Longitudinal cracking. Raveling.	3	Poor	30	5	Patching & milling.	Resurface entire road.	
West Turning Basin Service Road	Roadway			Asphalt	24,166	Some alligator cracking along edges. Longitudinal cracking.	4	Fair	30	5	Patching & milling.	Patching and eventually milling.	Roadway segment has shared maintenance responsibility with COFO. Middle section of road in worse condition than North and South ends.
Harbor-Lincoln Dr South Access Road	Roadway	A	West ~215 ft (west of RR crossing)	Asphalt	6,300	25% alligator cracking.	3	Poor	30	5	Patching & milling.	Patching and eventually milling.	
Harbor-Lincoln Dr South Access Road	Roadway	B	East ~376 ft (east of RR crossing)	Asphalt	11,000	Longitudinal cracking. Early signs of alligator cracking.	4	Fair	30	5	Seal Coat	Crack sealing and seal coat to delay need for resurfacing.	
East Turning Basin Access Road	Roadway			Asphalt	6,500	Some alligator cracking along edges. Longitudinal cracking.	3	Poor	30	5	Patching & milling.	Resurface entire road.	
South Carferry Dr	Roadway	A	North section encompasing rail crossing	Concrete	5,400	No signs of cracking or wear.	9	Excellent	25	25	None	None required.	
South Carferry Dr	Roadway	B	Middle section	Concrete	4,200	Some severe cracking.	4	Fair	25	0	Pour new concrete	Replace surface	
South Carferry Dr	Roadway	C	South Section	Concrete	7,400	No signs of cracking or wear.	9	Excellent	25	25	None	None required.	
Carferry-Harbor Dr Access Road	Roadway		Rail Crossing Section	Asphalt	5,453	Recent surface pavement project completed. Very minor cracking along west side rails.	8	Excellent	30	25	None	None required.	
Harbor-Lincoln Dr North Access Road	Roadway	A	West Section	Asphalt	7,200	Minor cracking.	6	Good	30	15	Crack Filling. Seal Coat.	Crack sealing and seal coat to delay need for resurfacing.	
Harbor-Lincoln Dr North Access Road	Roadway	B	Small pot holed middle section	Asphalt	400	Alligator cracking and pothole. Raveling.	2	Poor	30	0	Patching	Replace surface	
Harbor-Lincoln Dr North Access Road	Roadway	C	Middle section	Asphalt	5,600	Minor cracking.	6	Good	30	15	Crack Filling. Seal Coat.	Crack sealing and seal coat to delay need for resurfacing.	
Harbor-Lincoln Dr North Access Road	Roadway	D	East Section	Asphalt	2,100	Severe alligator cracking	2	Poor	30	0	Reconstruction with base repair.	Replace surface	
City Heavy Lift Dock Service Drive/Road	Roadway			Asphalt	56,244	Some longitudinal cracking. No alligator cracking. Possible raveling.	6	Good	30	15	Crack Filling. Seal Coat.	Patch 10% of the area until resurfacing needs to be done in the future. Sealcoat could extend life.	Avg. 40 ft wide drive lane trough CHLD extending from South Carferry Dr to northern extent of CHLD area.
City Heavy Lift Dock Pavement	Pavement Area	West	Western half of dock yard excluding the concrete dock apron.	Asphalt	230,800	Some longitudinal cracking. No alligator cracking. Possible raveling. Old building foundation area with plans to be surfaced with asphalt (5000 SF). Significant pavement damage bteween rails at southern end.	6	Good	30	15	Crack Filling. Seal Coat.	Patch 10% of the area until resurfacing needs to be done in the future. Sealcoat could extend life.	
City Heavy Lift Dock Pavement	Pavement Area	East	Eastern half of dock yard that includes tenant space (Milwaukee Intermodal Terminal).	Asphalt	203,700	Some ponding. Cracking over 50% of the area. Some potholes (5%). No visible raveling.	5	Fair	30	10	Crack Filling. Seal Coat.	Crack sealing and seal coat to delay need for resurfacing.	
City Heavy Lift Dock Concrete Apron	Pavement Area			Reinforced Concrete	28,500	No visible cracking or spalling.	8	Excellent	25	20	None	None required.	40 ft wide reinforced concrete apron behind dockwall with embedded rail.
Terminal 1 Pavement	Pavement Area			Asphalt	123,710	Ponding present. Alligator cracking over 50% of surface on southern portion. Northern portion (20%) shows no signs of cracking and is in better shape.	3	Poor	30	0	Reconstruction with base repair.	Replace surface.	
Terminal 1 Concrete Apron	Pavement Area			Reinforced Concrete	75,800	Spalling over 15% of the area. Some existing patches. Cracking. Low wear at eastern portion (10%), most likely due to low traffic volume. Area that wraps around treatment plant (5%) is cracking and spalling but no reason to address.	5	Fair	25	25	Crack filling and patching.	Future crack sealing to delay need for resurfacing.	
South Slip 1 West Apron	Pavement Area			Asphalt	18,524	Crack and spalling	2	Poor	30	0	Reconstruction with base repair.	Replace surface	
South Slip 2 West Apron	Pavement Area			Asphalt	25,971	Recent surface pavement project completed. No evidence of damage.	8	Excellent	30	30	None	None required.	
South Slip 3 West Apron	Pavement Area			Asphalt	41,524	Recent surface pavement project completed. No evidence of damage.	8	Excellent	30	30	None	None required.	

CONDITION AND RENEWAL SUMMARY
PAVEMENT

ASSET ID	ASSET TYPE	SEGMENT ID	SEGMENT DESCRIPTION	MATERIALS OF CONSTRUCTION	SEGMENT AREA (SF)	CONDITION SUMMARY (2021)	PASER SURFACE RATING	CONTION RATING	EST. UL (YEARS)	EST. RUL (YEARS)	WORK NEEDED	RENEWAL APPROACH SUMMARY	NOTES
South Shore Cruise Dock Pavement	Pavement Area			Asphalt	29,517	Evidence of standing water near storm drains in parking area. Cracking at end of pier.	6	Good	30	20	Crack filling and patching.	Future crack sealing to delay need for resurfacing.	Review standing water in some areas for potential future repair.
Lake Express West Parking Lot	Parking Lot			Asphalt	79,120	Recent surface pavement project completed.	10	Excellent	30	30	None identified.	None required.	
Lake Express East Parking Lot	Parking Lot			Asphalt	29,500	Can see some wear. No immediate attention needed.	9	Excellent	30	25		None required.	
Kaszube's Park Lot	Parking Lot			Asphalt	8,384	Crack and spalling across lot, some evidence of ponding.	3	Poor	30	5	Patching & milling.	Resurface entire road.	
Russell Avenue Pier Access Walkway	Walkway			Asphalt	3,681	Walkway in good condition. Some ponding of water noted toward western end.	6	Good	30	20	None	None required.	Review ponding in some areas for potential future repair.
Lake Express Walkway	Walkway			Asphalt	5,365	Walkway in good condition, some cracks at joints.	6	Good	30	20	Crack Filling. Seal Coat.	Future crack sealing to delay need for resurfacing.	

CONDITION AND RENEWAL SUMMARY
RAIL

ID	ELEMENT	RAIL	RAIL SIZE	TIES	TIE SIZE	SPIKES AND PLATES	JOINTS BARS/BOLTS	BALLAST	TRACK GAUGE	TRACK SURFACE	TRACK CROSS LEVEL	ANCHORS	OTHER NOTES (FROM INSPECTION REPORTS)	RUL RATING	RENEWAL APPROACH SUMMARY
10 Terminal	Track	9020 3 x 6	9020	-	-	-	-	-	57-1/4" 50 Feet from Curve to 58" at tangent for 22'	Wash out at one drain first third of track	-	-	Unloading Pit Abandoned Near Crossovers Hayes Light Duty Bumper at End; Flange Master Through Out; Filled in With Asphalt & Dirt; Drains Through Out Tracks	Fair	Potential replacement of corroded bar elements
10 Yard	Track	9020	9020	-	Mixed	10 single shoulder plates	Drilling 2-1/6 x 6; Rusted; Spiked Through bars	-	-	-	-	-	Excessively Corroded at joint bars, no visible breaks	Poor	Potential replacement of corroded bar elements
11 Terminal	Track	3 x 6 Drilling; West of Crossing 112 # some bad ties partially filled; 57-1/4" Gauge at joint West of Crossing Loose Joint on south rail 57-1/2" at West End of Crossing	9020	-	-	-	Loose Joints	-	-	-	-	Hayes Wd Light Duty Bumper at End; Sporadic Drains Throughout	Asphalt Broken Up; Flange Master in Track; Track Filled In; Unloading Pit By Unloading Tower	Fair	Further review by Rail Engineer
11 Yard	Track	Pull Apart Near North Curve	9020	Only Gauge Ties Good; Rotten Steel on South Half; North Half Tie Port - No Gauge Ties	Mixed	High Spikes	2-1/2 x 6 Drilling; Loose Bolts; Broken Washers	Most of track covered with Stone & Dirt	-	-	-	Sporadic - Rusted	Track Components rusted; Red board down; Bumper Hit Rail Broke; North end of track should be out of service	Poor	Repair of bumper; installation of replacement track components
12 Terminal	Track	9020 Comps to 112 in Rail Area	9020/112	-	-	-	-	-	-	Drains in Track	-	-	Timber in Gauge of Track for 40 Feet 140 Feet 2 Rail Asphalt Then Flange Master in Concrete; Flangeway Filled In; Bumper at End; Flange master close to running rail at end of first building both rails	Fair	Review photos highlighted and potential visual inspection of suspected defect
12 Yard	Track	OK but rusty at joints	9020	Sporadic rotten ties	6 x 8	Rusted; 9" single shoulder	Rusted in bars; 2/1/2 x 6	Good	OK	Fair	Fair	Not many in some areas; 3 Box Anchors / Rail	115 Off switch 50	Good	-
13 Intermodal	Track	2 Rail and Asphalt the entire section from crossing to end of track;	9020	-	-	-	-	-	-	-	-	-	-	Good	Potential visual inspection of suspected defect
13	Track	112 Off South Switch	9020	Sporadic clusters of bad ties	6 x 8	9" Plates single shoulders	2-1/2 x 6 Drilling	OK	OK	Minor Deviations	OK	Some	High Spikes; New North side outside gate at crossing to Switch S1	Excellent	-
14 Intermodal	Track	2 Rail Asphalt inside fence	9020	-	-	-	-	-	-	-	-	-	Bumper destroyed at end of track; 3 Rail in middle of track	Fair	Repair bumper and removed vegetation
14	Track	112/90 South End; Broken Rail at Joint; Large Gaps at West Rail; Short Rail near US Oil	9020	Sporadic Tie Clusters	6 x 8	9" Single Shoulder Plates; high Spikes	2-1/2 x 6 bars - Broken Bar; Rusted & Loose Bolts; One torched bar hole; Excessive corrosion in plates & bars;	-	Good	Fair	Minor	Some between S. Switches Some Sporadic	Comps to 115 4 Rail Lengths South of SW 57 Loose Bolts; Comps to New 115 Welded for 32' concrete Crossing; Remaining Track 2 Rail Fence Area	Poor	Replacement of corroded track components; Repair of broken rail
15 Bulk Track (Kinder Morgan Spur)														-	-
15 Extension	Track	2/34 x 5-1/2 West Rail 2 Rail Lengths	9020	Sporadic Bad Ties; Joint Tie Defects	-	Corroded; High Spikes	Loose bolts; Broken Bolt; Corroded Bars & Rail by Bars, Some Severe; Broken Bolt Near Switch 49	Limestone	OK	Fair	Fair; Hayes WD Bumping Post on the End	No	Chip in Rail End across from 6701 Tank; 2 Rail Lengths near SW60 - 9020; Greaser not working with 2 section of 5 bad ties in a row; Tourched comp bars at heel of switch 60; 112# between SW 60 & 61. 2 Broken Bolts in 112# Section	Poor	Further review by Rail Engineer
15 Ind. Track (US Oil terminal TR)														-	-
15 Intermodal	Track	9020 2 Rail Asphalt; Surface and Line Deviations, Some Severe	9020	-	-	-	-	-	-	-	-	-	Bumper Destroyed; Has Three Rail Crossings in Middle of Track	Poor	Repair of bumper - further review by Rail Engineer
15 Spur Track (US Oil Not Connected)														-	-
15	Track	2/34 x 5-1/2 West Rail 2 Rail Lengths; 3 x 6 Rest	9020	Sporadic Bad Ties; Joint Tie Defect	-	Corroded; High Spikes	Loose bolts; Broken Bolt; Corroded Bars & Rail by Bars, Some Severe; Broken Bolt Near Switch 49	Limestone	OK	Fair	Fair; Hayes WD Bumping Post on the End	No	Chip in Rail End across from 6701 Tank; 2 Rail Lengths near 60 - 9020; Greaser not working with 2 section of 5 bad ties in a row; Tourched comp bars at heel of switch 60; 112# between SW 60 & 61. 2 Broken Bolts in 112# Section	Poor	Replacement of corroded track components. Repair of chip in rail
16 East	Track	80 Foot	115	-	7 x 8	Double Spiked in Curves. 13" D.S. Plates	Insulated Joints South End of Crossing; Crossing timber Asphalt in Gauge Rail On Field; Side 32 Foot Crossing	Granite	OK	OK	OK	Every Third Tie; No close Clearance Sign South End	Paint All Comp Bars & Remark Clear Points, Walkway between Tracks Hazard; No Gaps on 80 Foot Rails 10 Foot Pit in Middle of Track, Welded 62 Clips	Good	Paint comp bars and remark clear points; Install HS&W signage(confirm)
16 Ind. East & West	Track	2 Rail Asphalt crossing on Both	-	-	-	-	-	-	-	Flange Broke and Higher than Rest on East	-	-	-	Excellent	-
16 Intermodal	Track	9020 Partially Paved	-	Bad	-	-	-	-	-	-	-	-	-	Excellent	-
16 West	Track	9020; 3 x 6; Wide Gaps	9020	Good	6" & 7"	Corroded	Loose bolts; Broken Bolt; Corroded Bars & Rail by Bars, Some Severe; Broken Bolt Near Switch 49	Good	OK	Fair	OK	none	Comps 9020 / 115 at 32 Foot Concrete Crossing	Excellent	-
17	Track	New 115; 3 Rail Asphalt North Crossing Pumping; Flange rail Tipped; 80 Foot	New 115	Good	7 x 8	2 Spiked; 13" Plates	6 Hole - OK	Shoulder has Walkway Hazards; Minor Surface Deviations; Granite	Good	Good - Some Uneven Walkways - OK	OK	Every Third	Insulated Joint Bars after North Crossing	Good	Potential walkway hazards to be removed or HS&W signage installed
18	Track	80 Foot Rails; No Gaps	115	-	6 x 8	-	-	Walkway Hazards	-	-	-	Every Third Tie	5 Buried Pipes Between All Tracks; Little or No Gap in Joints	Good	Further Review by Rail Engineer
19	Track	80 Foot Rails	115	-	6 x 8	-	-	Walkway Hazards	-	-	-	-	Little or no Gaps; Buried Pipes Between Tracks;	Fair	Further Review by Rail Engineer
2 Terminal	Track	DID NOT INSPECT. Washout in Asphalt Area	-	-	-	-	-	-	-	-	-	-	-	Excellent	-

CONDITION AND RENEWAL SUMMARY
RAIL

ID	ELEMENT	RAIL	RAIL SIZE	TIES	TIE SIZE	SPIKES AND PLATES	JOINTS BARS/BOLTS	BALLAST	TRACK GAUGE	TRACK SURFACE	TRACK CROSS LEVEL	ANCHORS	OTHER NOTES (FROM INSPECTION REPORTS)	RUL RATING	RENEWAL APPROACH SUMMARY
20	Track	80 Foot	115	Some Down ties	7 x 8	A Few High spikes - Curved Double Spiked	-	Granite; Missing Ballast on West Shoulder Near Middle	-	-	-	-	4 Capped Off Pipes Between Tracks; Broken Drain Tile 5" Between 20 and 19	Good	Repair/Replacement of broken drain tile; Further review by rail engineer regarding capped off pipes between tracks
3 Terminal	Track	-	112	-	-	-	-	-	57-1/2" at Joint East of Crossing	150 Feet Near Gate 2-Rail & Asphalt Jointed	-	-	Rest in Concrete With Formed Flangeway; Light Duty Hayes Bumper; Flange Ways Full; Some Wash Out at Start of Concrete	Fair	Repair defective concrete
5 Terminal	Track	-	115	Between Switch & Gate Filled In on East Side	-	-	-	-	-	Minor Surface in Ballast Section Along Dock	-	-	Light Duty Hayes Bumper; 2-Rail With Ballast Partially Filled Up; Drains in Gauge of Track Jointed; 150 Feet Near Fence 2 - Rail & Asphalt	Fair	Further Review by Rail Engineer
51 Stub	Track	New 115	New 115	New 7 x 9	7"	12" D.S. Plates	6 Hole	Clean Limestone	Good	Good	Good	20 Ties of Switch Solid; Every Other 20 Ties, then Every 3rd	Bumper at End of Track; Starting to get rusty;	Good	Further review by Rail Engineer
6 Terminal	Track	Comps to 115 - 2-1/2 Rails of 2-Rail & Asphalt; 112 After Timbers; Broken at Transition of Concrete Section Both Rails	9020/115	Not visible in asphalt	-	-	-	Between Switch and Crossing Filed In	-	15 Timber Asphalt Long Area after S Lincoln	-	-	Concrete Area Only Has Formed Flangeway Jointed; Broen Rail in Middle of dock at Expansion Joint of Concrete; Durable Bumping Post (Old); track is unusable in present condition;	Poor	Repair of broken Rails and defective concrete
7 Terminal	Track	Between Switch & Dressing 55-3/8" Gauge Bad Ties Dips; After Switch With 57-1/2" Gauge at Joint Past Heel of Frog	115	-	?	-	-	-	-	-	-	-	Flange Master on First 100' From Fence in Asphalt; Rest in Concrete Along Building With Flange Master; Hayes Bumping Post	Poor	Potential replacement of corroded track components. Further review by Rail Engineer
8 Ind. Track	Track	Rusty; Comps to 9020 South End 2-1/2 X 6; Loose Bolts	112 / 115	Sporadic Bad Tie Clusters	7 x 9	12" Rusted; High Spikes	112 # East - 115 # West for 7 on North End; 6 Hole Bars; Severe Rusting at Joints		-	-	-	None	57-1/2" Wide 6 Rail Lengths From South Switch	Good	-
8 Terminal	Track	112 Between Switch & S Lincoln Crossing; Some Rotten Ties - Partially Filled in With Ballast	9020	-	?	-	-	track Filled In	56"	Surface Deviations - Bent Flange Master; Drains in Track Gauge;; Budda Bumping Post Debris on Track at Bumping Post	-	-	Flange Master	Excellent	-
9 Terminal	Track	9020	9020	-	-	-	-	-	-	-	-	-	Broken Flange Master is Tire Hazard - Bumping Post Hit & Gone; Flange Master & Drains in Gauge of Track Asphalt & Dirt; Bent Flange Master Near Middle Close to Running Edge of Rail	Good	Repair / Replace broken flange masters; Install new bumping post; Installation of HS&W signage
Bulk Dock Spur	Track	115-lb	115	7"	-	132 D.S. 2 Spikes	6 Hole	Covered with gravel	-	Single Flange Timber & Gravel for most of Track	-	Every 3rd tie	Flange way filled in with dirt & gravel; Heavy Bumper at End of Track	Excellent	-
Cargill Lead	Track	115 # Cargill South Crossing; 112 to 115 at Crossing; High Rail 115; Low Rail 112	112	-	7 x 9	11"	-	Fouled Between Crossing	1" Wide Near Cargill South Crossing - Curve Worn	-	-	Cargill Mid Crossing 3 Rail 1/2" Wide	High Spikes; Cargill South 115 # Single Flange Timber & Asphalt; Excessive curve worn rails; Broken Bolt Between Cargill South Crossing & Next One North	Fair	Replacement of broken bolt; Further review regarding worn rails by rail engineer
CHLD 1	Track	Unused Has Two Street Switches; CHLD 1 CHLD 2 & CHLD INTERMODAL ALL UNUSED; Filled in With Asphalt With Tipped 2 Rail;	-	-	-	-	-	-	-	-	-	-	-	Good	-
CHLD 2	Track	Unused Has Two Street Switches; CHLD 1 CHLD 2 & CHLD INTERMODAL ALL UNUSED; Filled in With Asphalt With Tipped 2 Rail;	-	-	-	-	-	-	-	-	-	-	-	Good	-
CHLD Intermodal	Track	Unused Has Two Street Switches; CHLD 1 CHLD 2 & CHLD INTERMODAL ALL UNUSED; Filled in With Asphalt With Tipped 2 Rail;	-	-	-	-	-	-	-	-	-	-	-	Good	-
Connection	Track	Curve Worn Outside Rail 112 #	115	-	7 x 9	11"; Double Spike only outside Rail	6 Hole Bars	Limestone	56-57"	Good	-	No	-	Good	-
CP Lead	Track	9020; Comped Right Off Crossing 115 to 9020;	9020	-	6" & 7"	-	-	-	-	-	-	-	Track is insulated; Rails are worn;	Good	-
CP Tail	Track	115 Comps to 112; First 7 Rail Length; Gaps;	115	Good	7 x 8	12" & 11" Plates; 2 Spikes	6 Hole 115 #; Loose Bolts; 4 Hole 112 #;	Granite	56-1/2; 56 7 Rail Lengths From Switch 3 Slewed Ties;	good	Good	None	Missing 1 Bolt; Some Slewed Ties	Fair	Install 1No. Bolt (Potential visual inspection required to identify size/grade)
Industrial Lead	Track	2 3/4" X 5-1/2 West Rail 2 Rail Lengths. 3 X 6 Rest	9020	Sporadic Bad Ties; Joint Tie defect	-	Corroded; High Spikes	Loose Bolts; Broken Bolt; Corroded Bars & Rail by Bars, Some Severe; Broken Bolt Near Switch 49	Limestone	OK	Fair	Fair; Hayes WD Bumping Post on the End	No	Chip in Rail End Across From 6701 Tank; 2 Rail Lengths Near 60 9020; Greaser Not Working With 2 Section of 5 Bad Ties in a Row; Torched Comp Bars at Heel of Switch 60; 112# Between SW 60 & 61. 2 Broken Bolts in 112# Section	Poor	Replacement of loose/broken bolts, corroded track components and chip in rail
Lake Lead By Pass	Track	-	9020	A few bad ties, otherwise good	7 x 9	Some High Spikes	Loose	-	-	-	-	6 Box Anchors / Rail Stops Near SW 77 Area	-	Good	-
Lake Lead North	Track	OK; 112# From SW 74 to 76	115	Joint Tie defects; Sporadic Ties	7 x 9	High Spikes; Single Spiked in Curve	Loose Bolts 57-1/2 Wide Gauge; Loose Joint 57-1/2 3rd Joint From Harbor Drive - Slewed Tie;	OK	57 in Curve (West) One Spot 57-1/2 X 57-1/4	Crossing Looks Lower Than Road Asphalt Breaking Up	OK; Second Crossing 3 Rail - Flange Filled with Dirt; Gauge OK Anchored Tie Good;	No; Anchored B + Second Crossing;	Crossing on Harbor Dr - Single Flange Composite Timber & Asphalt; Timbers Leaning 115 # Welded Through Crossing; Some Steel Ties & Gauge Rods After SW 74 to 76 Comps Near SW 87;	Good	Replacement of loose bolts. Further review by rail engineer regarding track gauge
Lake Lead North between 77 & 79	Track	112 & 115	112/115	-	7 x 9	11"	Loose Bolts; Torched Bar Holes;	Partly fouled	-	-	-	-	Loose Bolts	Fair	Replacement of loose bolts

CONDITION AND RENEWAL SUMMARY
RAIL

ID	ELEMENT	RAIL	RAIL SIZE	TIES	TIE SIZE	SPIKES AND PLATES	JOINTS BARS/BOLTS	BALLAST	TRACK GAUGE	TRACK SURFACE	TRACK CROSS LEVEL	ANCHORS	OTHER NOTES (FROM INSPECTION REPORTS)	RUL RATING	RENEWAL APPROACH SUMMARY
Lake Lead North between 87 & 94	Track	3 X 6 Drilling 55-3/4" Gauge in One Spot; 3 Rail Crossing After SW 93 all Welded Comps Back to 9020; 2 Rail Crossing at Building 2 Flange Rails High Only One Side; 2 Rail Crossing at Building 1 Flange Higher Then Running; 7'4" Rail at Wide Joint Building 1;	9020	-	Mixed	Ties in Bad Shape Between Building 1 & 2 Loose Bolts; Fouled Ballast; 3 X 6 & 2-3/4 X 5-1/2 North of Jones Street;	Loose Bolts Between 89 & 93; Loose Bolts on Comps; Loose Bolts Through Out;	Minor Surface Deviations; More Fouled Ballast; Fouled Ballast Through SW 94;	Joint Loose 57-1/2" in Crossing Building 1; 57" Gauge After Jones Crossing; 57-3/4" Gauge Near Gate of Veolia Private Track; Loose Bolts Low Stone	3 Rail 115# Crossing at Jones Street After Frog of SW 94 Comp Back to 90	Out of Cross Level	-	One Corroded Rail 10' 5" 2-1/2" X 5 X 6 Drilling One side Other 3 X 6; One Short Rail Other Rail Buried 54" Both Across From Terminal 3; Shimmed Ties Near 89 Comps at SW 89 115 to 9020 3 X 6	Good	Replacement of loose bolts
Lake Lead South	Track	-	115	-	7 x 9	High Spikes 13" D.S.; 4 Spiked with Anchor Spike;	6 Hole bars	Limestone; Filled in Some Near Crossing	-	-	Reverse Elevation	No	Slewed Ties	Fair	-
Lake Lead South	Track	115	115	-	7 x 8	-	-	Moving in Curve between Crossings	-	-	-	Solid Anchor at Crossing 20 ties 14 Concrete Panel Length Pandrol Plates	Inconsistent Degree Curve; Close Clearance to Power Poles. Curve Moving; Broke Bonds on South West End at Insulated Joints; Harbor Crossing Pandrol Plates Concrete Lagged 11 Panels Long;	Poor	Further review by Rail Engineer
Lead 1	Track	Welded 3 Rail Crossing at South Car Ferry Drive	115	Sporadic Rotten Ties	7 x 8	High Spikes	Rusted Bolts	Fouled Ballast	-	-	Gillen North Crossing 112 3 Rail Flange Filled In; Gillen South Crossing 115 3 Rail Flange Filled	-	Locked Derail; Flange Filled In	Fair	Potential replacement bolts - Further review by Rail Engineer
Lead 1 Between 3 & 4	Track	Replace 1 Rail Before LH; Stock Rail of Switch 3;	112	-	7 x 8	11" D.S.	6 Hole	Fouled near Switch 4	OK	Good	OK	None	Some slewed ties; Loose Bolts	Fair	Further review by Rail Engineer
Lead 1 Between 4 & 5	Track	-	112	-	-	11" D.S. Some Plates Cut ties	-	Limestone, OK	Good	-	Out of Cross Level - Reverse	no	Surface Curve	Fair	Further review by Rail Engineer
Lead 1 Between 6 & 16	Track	Good	112	7 x 9	7 x 9	11" D.S.	6 Hole	Limestone	-	OK	OK	None until Welded area, Every other except at Crossing; Every one 15 Ties	Welded 115 # Near First Crossing to Switch 16; 3 Rail 3 Rail Costco Crossing; Intermodal Terminal - 3 Rail + Asphalt;	Good	Further review by Rail Engineer
Lead 2 Industrial	Track	21 switch 115 - Track 112	115	-	7 x 9	-	-	Limestone; Track buried in Limestone	57-1/2" Wide at 2 Joints North of 17	-	-	-	Single Flange Timber With Ballast; Walking Hazards West Side; Flange Has Material in it Ballast; Loose Timbers - Loose Bolts;	Fair	Replacement of loose bolts; securing of loose timbers
Lead 2	Track	80' Rail	115	-	7 x 9	-	-	Limestone; Top of Rail East Side	57" Gauge in Curve With High Spikes	-	-	Every Other	High Spikes in Curve Gauge Pandrol's? 320'; North End Near 21 Gauge 57 with 1/4 to 1/2" Movement;	Good	-
Lead 3	Track	112-lb	112	19 Defective Ties 16 & 65	7 x 9	11" D.S. 2 Spikes / Plate	6 Hole Bars	-	-	-	-	No	Loose Bolts; Short Rail	Good	Replacement of defective Ties
Lead 3 BTW SW 63-65	Track	Curve Worn in Curve	112	OK	7 x 9	Outside Rail double Spiked	6 Hole, Not all holes drilled	Limestone	57-1/2 in Curve On 2 Joints	OK	OK	No Anchors	Loose Bolts - Tamp; 57-1/2 Gauge Outside Joint; Down Tie High Spikes;	Fair	Replacement of defective Ties
Lead Track 39 to 50	Track	112-lb	112	7 x 8	7 x 8	11" Tie Plates	Rusty Joints; 2 Broken Bolts near SW 50	Good	OK	Fine	-	None	2 Area's Filled in for Crossings	Fair	Replacement of 2No. Broken bolts
Piggy Back N Spur	Track	9020 - Disconnected	9020	-	6" & 7"	-	-	-	-	-	-	-	-	Excellent	-
Piggy Back Runaround	Track	90 - 100 - 112 - 115	90/10/112/	-	6" & 7"	-	2-1/2 x 6 90#	-	-	Fair	-	No	Some Ties Buried Near Switch 7; Unused Switch;	Good	Clear debris from ties locations and inspect condition of newly exposed areas
Piggy Back S Spur	Track	115 - Comps to 112; 115 - 6 Hole Bars; 112 - 4 Hole Bars;	115	Some Slewed Ties	7 x 9	7-3/4 X 12" D.S. Plate; Single Spiked;	6 Hole 115#; 4 Hole 112#	Good; End of Track is Over grown w/ Weeds & brush	56" to 56-1/4"	Fair	OK	None	-	Good	-
UPRR Lead	Track	115 and 13" Plates in What We Think Belongs to the UPRR; Anchored Every Other on UP None on Rest;	112	-	7 x 9	11" D.S.	One Broken Bolt	Mixed	-	-	-	-	Surface Deviations	Good	-

CONDITION AND RENEWAL SUMMARY
RAIL

ID	ELEMENT	RAIL	RAIL SIZE	TIES	TIE SIZE	SPIKES AND PLATES	JOINTS BARS/BOLTS	BALLAST	TRACK GAUGE	TRACK SURFACE	TRACK CROSS LEVEL	ANCHORS	OTHER NOTES (FROM INSPECTION REPORTS)	RUL RATING	RENEWAL APPROACH SUMMARY
SW 1	Switch	Almost new; straight side unused	115	Fair	-	11" D.S.	-	-	-	-	-	-	Vegetation; Missing 1-1/4 x 9-1/2 Guard rail bolt	Fair	-
SW 16	Switch	Stock Rail Heavy Wear	112	-	-	-	-	-	-	-	-	No	57' gauge with etching; Replace Head block ties, lag braces	Poor	Replace head black ties & ag braces
SW 17	Switch	Good	115	Good	-	13"	-	Limestone	-	-	-	Solid	-	Fair	-
SW 2	Switch	Some flow - good	115	Fair	-	Hooks	-	Granite - Good	-	-	-	None	Loose Braces, Loose Guard Rail, Bolts; Chipped RH Point. Switch is not being greased. Switch stand moves when thrown, both head blocks should be replaced.	Deficient	Secure braces, guard rail; repair chip and grease switch
SW 20	Switch	Good	115	Good	-	13"	-	Limestone	-	-	-	Yes	Repair Foot Latch on switch stand - Sticks	Poor	Repair foot latch
SW 21	Switch	112# & 115#	115	Good	-	11"	-	-	-	-	-	No	Torched Straight Closure; Foot Latch Sticks;	Good	-
SW 27	Switch	Curve Closure some Curve wear	115	-	-	-	-	-	-	-	-	-	Frog - Poor, Loose bolts - Replace; Flow on Both Stock Rails; Missing 1 HB Bolt 11"; Frog is in poor condition - suggest replacement;	Deficient	Remediate Frog; Replace loose/missing bolts;
SW 3	Switch	Curve closure rail is curve worn	112	OK	-	-	-	Limestone	-	-	-	-	Replace Curve Closure; Loose bolts on frog. Loose hooks under frog; High spikes. Loose bolts through out; Recommend Samson Point and Stok Rails	Poor	Tighten loose bolts to frog and throughout;
SW 30	SWITCH - REMOVED													-	
SW 37	Switch	Rusty but OK	115	Good	-	-	-	Section after points fouled	-	-	-	None	Rusty	Good	-
SW 38	Switch	Good	112	Good	-	11" D.S.	-	Fouled	-	-	-	-	Missing 1 Bolt in Heel Block; R.H. Stock Chipped at Point; 57-1/8 Gauge C. Closure;	Fair	Relace missing bolt; repair chip; further review by rail engineer regarding gauge defect
SW 39	Switch	Fair	112	Bad	-	11"	-	Good	-	-	-	No	Crib Out Points; Some Ties Down, Nothing Holding Rail;	Fair	Repair defect ties
SW 4	Switch	Curve closure rail curve worn, gauge good	112	-	-	-	-	Fouled in Frog Area	-	-	-	-	Other NotesLoose bolts. Need #2 rod. Replace broken frog, replace both closure rails and upgrade to Samson Points; Point guard is at 4 3/8" which exceeds the maximum	Deficient	Tighten loose bolts to frog and throughout;; replace broken frog
SW 45	NO REPORT														Further Review by Rail Engineer
SW 46	Switch	-	9020	1 Head Block 13', 2 - 9', 3 -10', 1 -11', 1 -12', 1-13', 2-14' - these ties should be replaced;	-	-	-	Limestone	-	-	-	-	9020 3 x 6	Poor	Replace defective ties
SW 49	Switch	New 115	115	-	-	12 D.S.	-	-	-	-	-	-	Crossing Timber & Asphalt	Good	-
SW 5	Switch	OK 6 & 6 Hole Bars	112	OK	-	11" D.S.	-	Fouled on Right Side	-	-	-	-	Replace 1 Head Block Tie	Poor	Replace 1No. Tie head block
SW 50	Switch	Good	115	-	-	11" D.S.	-	OK	-	-	-	No Anchors	Point Guard 4-1/4 with Loose Bolts; Rusted Bolts & Bars;	Poor	Repair/Replace corroded track components
SW 51	Switch	New	115	New 7 x 9	-	-	-	Good	-	-	-	Yes	-	Excellent	-
SW 52	Switch	3 x 6 Flat	9020	Good	-	-	-	OK	-	-	-	No	Welded Point Guard; CC Curve Worn 57-3/8" at Joint; High Spikes; Crossover 3 X 6 9020 Good Shape No Anchors;	Good	Further Review by Rail Engineer
SW 53	Switch	Good	112	Good	-	11" D.S.	-	Good	-	-	-	No	Replace H.B. Ties; Racor Bolt on Point Guard Spiked; 1 X 11" Frog Bolt Missing;	Fair	Replace H.B ties, replace defective/missing bolts
SW 54	Switch	57 on CC Joint	112	-	-	11" D.S.	-	-	-	-	-	-	Bolt on Racor Point 4-5/8 Gap; 1/2" Tight Gauge at Frog; Interlaced Ties Between Switches;	Good	-
SW 55	Switch	2-1/2" X 6"	9020	Good	-	-	-	Clear	-	-	-	No	Point Area Out of Cross Level caused by Interlaced Ties	Good	Further Review by Rail Engineer
SW 56	Switch	3 x 6	9020	Fair	-	Flat Plates	-	Limestone	-	-	-	None	Short Piece in CC	Fair	Possible visual inspection required to confirm - Further Review by Rail Engineer
SW 57	Switch	Fair	112	-	-	Hooks	-	Clean	-	-	-	No	Bolt on Point Guard Only 1 Bolt; 4-1/2" Gap on Point Guard; Wheel Burns RH Point LH Stock Rail; Replace Interlaced Ties 4-14' + 4-23';	Good	-
SW 58	Switch	3 x 6"	9020	Fair	-	Flat Plates, Spiked	-	Limestone OK, Cross Level Bad	-	-	-	None	Short Splice After LH Stock Rail; Guard Rails Loose. Point on frog Peened Over; Fabricated Frog Bars With Loose Bolts - Replace;	Poor	Replace loose bolts; repair defects to guard rail
SW 59	SWITCH - REMOVED													Fair	-
SW 6	Switch	Double Spiked CC	115 & 112	Good	-	No	-	Limestone - OK	-	-	-	-	Weld on LH stock rail plus point guard 4-1/8"; Loose bolts on point guard; Can adjust point guard still;	Poor	Replace loose bolts; repair defects to guard rail
SW 60	Switch	-	112	Repair 1 Down Tie 13'	-	-	-	-	-	-	-	-	Recommend Samson Points; Broken Frog;	Deficient	Repair defects to frog
SW 61	Switch	Closures are 115#	112	-	-	-	-	-	-	-	-	None	Point Guard Replace 4-3/4" Gap; Loose Bolts;	Poor	Replace loose bolts; repair defects to guard rail

CONDITION AND RENEWAL SUMMARY
RAIL

ID	ELEMENT	RAIL	RAIL SIZE	TIES	TIE SIZE	SPIKES AND PLATES	JOINTS BARS/BOLTS	BALLAST	TRACK GAUGE	TRACK SURFACE	TRACK CROSS LEVEL	ANCHORS	OTHER NOTES (FROM INSPECTION REPORTS)	RUL RATING	RENEWAL APPROACH SUMMARY
SW 62	Switch	Fair	112	Poor	-	11"	-	Limestone	-	-	-	No	3 Bad Ties Before Switch; Loose Bolts; Replace 14' Head Block;	Poor	Replace defective ties, head block and loose bolts
SW 63	Switch	CC Curve Worn 57-1/4 @ Joint	112	Good	-	11"	-	Limestone	-	-	-	-	Point Guard 4-5/8 - Replace; Only Has 2 Bolts & 2 Spikes Holding; Rail Curve Worn; Switch Stand & Stock Rails Move;	Poor	Replace guard rail section; secure switch stand and stock rails
SW 64	Switch	Curve Worn Curve Closure	112	Poor	-	-	-	Limestone	-	-	-	No	Curve Closure rail gauge is at 57-1/4; RH Point Single Reinforced; Point Guard Beyond Maximum Adjustment;	Poor	Further Review by Rail Engineer
SW 65	Switch	-	112	-	-	-	-	-	-	-	-	-	Excessively Worn Curve Closure 57"	Poor	Replacement components? - Further Review by Rail Engineer
SW 66	Switch	New	115	New	-	-	-	Limestone	-	-	-	Solid	-	Excellent	-
SW 67	Switch	-	115	-	-	-	-	New	-	-	-	Solid	80 foot stock rails; chipped RH point;	Good	-
SW 68	Switch	-	115	-	-	-	-	New	-	-	-	-	80 foot stock rails; closures one piece;	Good	-
SW 69	Switch	-	115	-	-	-	-	New	-	-	-	-	80 foot stock rails; #2 rod slightly rubbing;	Good	-
SW 70	Switch	-	115	-	-	-	-	New	-	-	-	-	80 foot stock rails; RH point requires welding; #1 rod rubbing on tie; Abnormal wear on right-hand point - too close to curve; Track appears to be moving in front of switch points;	Fair	-
SW 71	Switch	-	115	-	-	Hooks	-	New	-	-	-	Solid	#2 rod rubbing; no joints in closures;	Good	-
SW 72	Switch	New	115	-	-	Heel Block 5 Hole	-	-	-	-	-	-	#1 rod rubbing on tie; RH point slightly chipped; slight gap left hand point;	Good	Further Review by Rail Engineer
SW 73	Switch	New 13" Plates	115	-	-	-	-	-	-	-	-	so ????	Switch is located on north end of new yard and is not shown on the plans;	Fair	-
SW 74	Switch	C.C. 57-1/4 @ Joint	112	-	-	-	-	-	-	-	-	No	Left-hand point is Gapped; Model FM Point Guard at Maximum Adjustment;	Fair	Further Review by Rail Engineer
SW 75	Switch	New	115	-	-	-	-	-	-	-	-	Full Box	-	Excellent	-
SW 76	Switch	57 - 57-1/4 Gauge CC. Curve Worn	112	-	-	-	-	-	-	-	-	-	Point Guard 4-1/2 Replace	Fair	Replace point guard
SW 77	Switch	Fair	112	OK	-	11" D.S.	-	Fouled Some	-	-	-	-	Switch Stand Throws Hard - suggest upgrade to Backsaver Switch Stand; High Spikes; Down Ties;	Fair	Upgrade to Backsaver switch stand
SW 78	Switch	OK	112	Poor	-	11"	-	Fouled	-	-	-	-	Point Guard Loose - 1 Bolt 4-3/4	Fair	Replace loose bolt
SW 78-1	Switch	-	9020	-	-	-	-	-	-	-	-	-	Gapped Right-hand switch point; Stock rail joint 57 3/8" gauge; point area filled in above ties, needs cribbed out; Dipped in left hand point area. - raise;	Fair	Raise settled section; Further Review by Rail Engineer regarding gauge defects
SW 78-2	Switch	9020	9020	Covered in Asphalt	-	-	-	In Asphalt	-	-	-	-	Flange Master in switch; Switch stand area is full of dirt; Point area appears to be inoperable;	Deficient	Remediate Point area; Clear debris from Switch stand area
SW 78-3	Switch	9020	9020	Covered in Asphalt	-	-	-	In Asphalt	-	-	-	-	Could not inspect cars on track; point area full of debris;	Poor	Clear debris; Possible revisit required
SW 79	Switch	OK	112	-	-	-	-	Fouled	-	-	-	No	Frog: 1 X 14" Bolt Missing # 112 Loose Bolts; Bolt on Point Guard 4'1/2"; Down Tie at Heel Block; Down Ties Turnout Side;	Poor	Replace loose/missing bolts; remediate defects to ties
SW 79-1	Switch	9020	9020	Covered in Asphalt	-	-	-	In Asphalt	-	-	-	No	Bent rail at end of flange rail;	Deficient	Repair/replace bent section of rail
SW 86	Switch	112-lb	112	See List (other notes)	-	11"	-	Slightly fouled	-	-	-	1	FM Point Guard 4-3/8" max adjustment; Switch Stand Moves when thrown;	Poor	Secure switch stand. Further review by Ril Engineer regarding Point Guard defect
SW 87	Switch	9020	9020	See List (other notes)	-	Single Shoulder	-	Switch is out of cross level	-	-	-	No	High Spikes	Good	-
SW 88	Switch	3 x 6	9020	3-9' 2-10' 1-15.'	-	Flat Plates	-	-	-	-	-	No	Switch will not throw; heel block bolts loose and rusty; Right-hand point is gapped; flat right-hand stock rail joint at heel block;	Deficient	Replace loose bolts, Switch appears seized - confirm? Confirm tie plates condition
SW 89	Switch	New 115-lb rail - 13 " plates; 6 hole Bars	115	Mostly NEW	-	Hooks	-	Fouled	-	-	-	-	#2 rod close to rubbing on tie; 24' timber and rock crossing in closure area;	Good	Confirm repair
SW 93	Switch	3 x6 drilling; comps to 115 in switch after frog;	9020	OK - some covered in asphalt	-	Flat plates	-	mud and out of cross level	-	-	-	-	Bent right hand point; one brace on left side popped out of rail; #1 rod rubbing; Comps at frog heel;	Poor	Confirm repair
SW 94	Switch	115-lb Good condition	115	Buried in mud	-	-	-	Full of mud out of cross level	-	-	-	-	out of cross level; Comps from 9020 to 115-lb rail; Switch is unused and is completely full of mud in the point area;	Deficient	Clear debris from switch area; Possible revisit required to inspect exposed areas

CONDITION AND RENEWAL SUMMARY
EQUIPMENT

ASSET ID	ASSET TYPE	MANUFACTERER	PURCHASE YEAR	CURRENT USE	MAJOR RENEWALS	CONDITION SUMMARY (2021)	EST. UL (Years)	EST. RUL (Years)	% RUL	CONDITION RATING	RENEWAL APPROACH SUMMARY
Manlift Snorkel TB80 (2006)	BOOM LIFT	SNORKEL INTERNATIONAL	2012	Normal operations, occasional 2-3 times/month use	N/A	Operational	35	26	74	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
Manlift Terex	BOOM LIFT	TEREX	2006	Infrequent use	Needs to be repaired and brought back into service	Currently out of service	35	20	57	GOOD	Currently out of service. Evaluate if asset is required for future port operations. Basket replacement and potentially additional maintenance required per original equipment manufacturer to return to service.
Ingersoll-Rand (Air Compressor, Trailerable)	COMPRESSOR	INGERSOLL-RAND	1985	Normal operational use	None identified	Operational	35	0	0	DEFICIENT	Estimated age, Compressor to be inspected and preventative maintenance performed per OEM recommendations as required for continued use.
Sullair 185 CFM Compressor / Towable (2015)	COMPRESSOR	SULLAIR	2015	Currently out of service	Needs to be repaired and brought back into service	Currently out of service	35	29	83	DEFICIENT	Currently out of service. Evaluate if asset is required for future port operations. Maintenance required per original equipment manufacturer to return to service.
Sullair 185 CFM Compressor / Towable (2019)	COMPRESSOR	SULLAIR	2019	Normal operational use	N/A	Operational	35	33	94	EXCELLENT	Maintain in accordance with original equipment manufacturer's recommendations.
P&H 5300R 300T CRAWLER / #17	CRANE	P&H	1979	Normal operations frequency twice/month	Rebuilt engine (2016, $27K), Maintained Hyd system (2018, $62K), Repaired Torque converter (2017, 2018, $36K)	Operational	75	33	44	GOOD	Continue to maintain crane operational, continued load testing for recertification. Body (tin work) to be completed in future.
Manitowoc 4100 Series II 240T / #19	CRANE	MANITOWOC	1992	Normal operations frequency of use, daily use for typical barge unload operations.	Repair/replace swing shaft and hook roller bearing (2012, $14K), Replaced crawler frame rollers and boom cable (2013, $39K), Replaced and adjusted clutch linings (2018, $8K)	Operational	50	21	42	GOOD	Continue to maintain crane operational, continued load testing for recertification. Continued cable replacements for frequent daily use.
Manitowoc 2250 300T / #22	CRANE	MANITOWOC	2016	Normal operations frequency of use, daily use for typical ship unload operations.	Replaced main drum cable (2018/2019, $43K)	Operational	50	45	90	GOOD	Continue to maintain crane operational, continued load testing for recertification. Continued cable replacements for frequent daily use.
220 TON THEILACKER STIFF LEG DERRICK / #15	CRANE	THEILACKER	1969	Infrequent use, approx. oncer per year. Specialized use for large capacity extended over water.	Complete rebuild (2007/2008) Quad Certification (2019, $18K)	Operational	75	23	31	FAIR	Continue to maintain crane operational, continued load testing for recertification.
70 TON GANTRY CRANE / #09	CRANE	CLYDE	1952	Very minimal use for ship maintenance.	Replaced boom cable, main hoist hanger block, re-built boom (2013, $154K)	Non-operational, not certified	75	6	8	DEFICIENT	No planned operation at this time. Crane is not certified. No plans to recertify.
90 TON BUCYRUS ERIE TRUCK CRANE / #18	CRANE	BUCYRUS-ERIE	1980	Normal operations, typically used for winter ship lay-up, specific seasonal use	Upgrade crane scale (2012, $8K), Repaired winch brake (2014, $8K), Rebuilt boom and extension cylinders (2019, $41K)	Operational	45	4	9	POOR	Continue to maintain crane operational, continued load testing for recertification. Future higher capacity and rough terrain capability replacement to be considered in the future.
Middlebury Enclosed Trailer 8.5x24	EMERGENCY RESPONSE EQUIPMENT	MIDDLEBURY TRAILERS, INC	2012	Infrequent use for training only, kept in storage	N/A	Operational	35	26	74	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
OIL BOOM / MARK II RESPONSE BOOM	EMERGENCY RESPONSE EQUIPMENT	PARKER SYSTEMS	2012	Infrequent use of 100FT length, 1 or 2 times/year	N/A	Operational, individual sections used and rented to tenants, cleaned upon return	20	11	55	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
Mastercraft Forklift 6000#	FORKLIFT	MASTERCRAFT INDUSTRIAL EQUIPMENT	?	Normal operations, occasional 2-3 times/week use	None identified	Operational	35		0	DEFICIENT	Original purchase year of this forklift is unknown. Inspection is required for continued operation but the condition rating may be acceptable for continued use.
Kalmar 52,000# Cap. Forklift (Unit 3)	FORKLIFT	KALMAR	1995	Normal operations, occasional once weekly use	None identified	Operational	35	9	26	FAIR	Maintain in accordance with original equipment manufacturer's recommendations.
Kalmar 52,000# Cap. Forklift (Unit 5)	FORKLIFT	KALMAR	1996	Normal operations, occasional once weekly use	None identified	Operational	35	10	29	FAIR	Maintain in accordance with original equipment manufacturer's recommendations.
Caterpillar IT-28 Front-end loader	FRONT LOADER	CATERPILLAR	2019	Normal operational use	None identified	Operational	25	23	92	EXCELLENT	Maintain in accordance with original equipment manufacturer's recommendations.
Wacker Unit #5 (light tower)	LIGHT TOWER	WACKER	2007	Minimal normal operational use	None identified	Operational	25	11	44	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
Wacker Unit #6 (light tower)	LIGHT TOWER	WACKER	2007	Minimal normal operational use	None identified	Operational	25	11	44	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
Allmand Night Light ProII V Series SHO-HD 7.5kW (light tower)	LIGHT TOWER	ALLMAND BROS. INC. / HOLDREGE NE.	2012	Minimal normal operational use	None identified	Operational	25	16	64	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
Allmand Night Light ProII V Series SHO-HD 7.5kW (light tower)	LIGHT TOWER	ALLMAND BROS. INC. / HOLDREGE NE.	2012	Minimal normal operational use	None identified	Operational	25	16	64	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
Allmand Night Light ProII V Series SHO-HD 7.5kW (light tower)	LIGHT TOWER	ALLMAND BROS. INC. / HOLDREGE NE.	2012	Minimal normal operational use	None identified	Operational	25	16	64	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
Allmand Night Light ProII V Series SHO-HD 7.5kW (light tower)	LIGHT TOWER	ALLMAND BROS. INC. / HOLDREGE NE.	2012	Minimal normal operational use	None identified	Operational	25	16	64	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
TRAFFIC CONTROL GATES	SECURITY EQUIPMENT		2012	Infrequent use for training only, kept in storage	N/A	Operational	75	66	88	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
TRAFFIC CONTROL GATES	SECURITY EQUIPMENT		2012	Infrequent use for training only, kept in storage	N/A	Operational	75	66	88	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.

CONDITION AND RENEWAL SUMMARY
EQUIPMENT

ASSET ID	ASSET TYPE	MANUFACTERER	PURCHASE YEAR	CURRENT USE	MAJOR RENEWALS	CONDITION SUMMARY (2021)	EST. UL (Years)	EST. RUL (Years)	% RUL	CONDITION RATING	RENEWAL APPROACH SUMMARY
TRAFFIC CONTROL GATES	SECURITY EQUIPMENT		2012	Infrequent use for training only, kept in storage	N/A	Operational	75	66	88	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
CRASH GATE LINCOLN MEM.DR.	SECURITY EQUIPMENT		2006	Infrequent use for training only, kept in storage	N/A	Operational	75	60	80	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
CRASH GATE CARFERRY DR.	SECURITY EQUIPMENT		2006	Infrequent use for training only, kept in storage	N/A	Operational	75	60	80	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
PSC LED MESSAGE CENTER	SECURITY EQUIPMENT	PSC	2012	Infrequent use for training only, kept in storage	N/A	Operational	35	26	74	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
PSC LED MESSAGE CENTER	SECURITY EQUIPMENT	PSC	2012	Infrequent use for training only, kept in storage	N/A	Operational	35	26	74	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
PSC LED MESSAGE CENTER	SECURITY EQUIPMENT	PSC	2012	Infrequent use for training only, kept in storage	N/A	Operational	35	26	74	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
TRAFFIC CONTROL LIGHTS / RED GREEN	SECURITY EQUIPMENT		2012	Infrequent use for training only, kept in storage	N/A	Operational	35	26	74	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
TRAFFIC CONTROL LIGHTS / RED GREEN	SECURITY EQUIPMENT		2012	Infrequent use for training only, kept in storage	N/A	Operational	35	26	74	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
TRAILER MODULAR (ENCLOSED 8' X 30')	SECURITY EQUIPMENT	FOREST RIVER HOUSING, INC	2012	Infrequent use for training only, kept in storage	N/A	Operational	30	21	70	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
TRAILER MODULAR (ENCLOSED 8' X 30')	SECURITY EQUIPMENT	FOREST RIVER HOUSING, INC	2012	Infrequent use for training only, kept in storage	N/A	Operational	30	21	70	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
TRAILER MODULAR (ENCLOSED 8' X 30')	SECURITY EQUIPMENT	FOREST RIVER HOUSING, INC	2012	Infrequent use for training only, kept in storage	N/A	Operational	30	21	70	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
TRAILER MODULAR (ENCLOSED 8' X 20')	SECURITY EQUIPMENT		2012	Infrequent use for training only, kept in storage	N/A	Operational	30	21	70	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
SLIDE GATE / S. END OF CHLD OVER RR TRACKS	SECURITY EQUIPMENT		2014	Infrequent use for training only, kept in storage	N/A	Operational	75	68	91	EXCELLENT	Maintain in accordance with original equipment manufacturer's recommendations.
ELECTRICAL SERVICE - MOORING BASIN WEST	SHIP POWER		2010	480V, 400A, 2 services, normal operational use	N/A	Operational	40	29	73	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
ELECTRICAL SERVICE - MOORING BASIN EAST	SHIP POWER		2011	480V, 400A, 2 services, normal operational use	N/A	Operational	40	30	75	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
ELECTRICAL SERVICE - MOORING BASIN NORTH	SHIP POWER		2018	480V, 400A, 2 services, normal operational use, Heavy Lift Dock	N/A	Operational	40	37	93	EXCELLENT	Maintain in accordance with original equipment manufacturer's recommendations.
New Holland Skid Steer (2009)	SKID STEER	NEW HOLLAND	2009	Normal operational use	None identified	Operational	25	13	52	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
New Holland Tractor 4060 (2009)	TRACTOR	NEW HOLLAND	2009	Normal operational use	None identified	Operational	25	13	52	GOOD	Maintain in accordance with original equipment manufacturer's recommendations.
Dodge Caravan (2010)	VEHICLE	DODGE	2010	Normal operational use	None identified	Operational	10	0	0	DEFICIENT	Condition rating based on useful life and recommended vehicle interval replacement strategy. Vehicles to be replaced every 5 to 10 years based on use.
Dodge Ram 3500 Reg Cab DRW Dump (2007)	VEHICLE	DODGE	2009	Normal operational use	None identified	Operational	10	0	0	DEFICIENT	Condition rating based on useful life and recommended vehicle interval replacement strategy. Vehicles to be replaced every 5 to 10 years based on extent of use.
GMC Sierra 2500 Reg Cab SRW 4x4 (2009)	VEHICLE	GMC	2009	Normal operational use	None identified	Operational	10	0	0	DEFICIENT	Condition rating based on useful life and recommended vehicle interval replacement strategy. Vehicles to be replaced every 5 to 10 years based on use.
Chevrolet Cruze 4D (2017)	VEHICLE	CHEVROLET	2017	Normal operational use	None identified	Operational	10	6	60	GOOD	Condition rating based on useful life and recommended vehicle interval replacement strategy. Vehicles to be replaced every 5 to 10 years based on use.
Ford F-250 4x4 Reg Cab SRW (2016)	VEHICLE	FORD	2015	Normal operational use	None identified	Operational	10	4	40	FAIR	Condition rating based on useful life and recommended vehicle interval replacement strategy. Vehicles to be replaced every 5 to 10 years based on use.
Ford F-250 4x4 Reg Cab SRW (2017)	VEHICLE	FORD	2017	Normal operational use	None identified	Operational	10	6	60	GOOD	Condition rating based on useful life and recommended vehicle interval replacement strategy. Vehicles to be replaced every 5 to 10 years based on use.
Ford Transit Van CB (2019)	VEHICLE	FORD	2019	Normal operational use	None identified	Operational	10	8	80	GOOD	Condition rating based on useful life and recommended vehicle interval replacement strategy. Vehicles to be replaced every 5 to 10 years based on use.
Ford F-250 4x4 Reg cab SRW (2019)	VEHICLE	FORD	2019	Normal operational use	None identified	Operational	10	8	80	GOOD	Condition rating based on useful life and recommended vehicle interval replacement strategy. Vehicles to be replaced every 5 to 10 years based on use.
Jeep Patriot Latitude (2012)	VEHICLE	JEEP	2013	Normal operational use	None identified	Operational	10	2	20	POOR	Condition rating based on useful life and recommended vehicle interval replacement strategy. Vehicles to be replaced every 5 to 10 years based on use.

CONDITION AND RENEWAL SUMMARY
EQUIPMENT

ASSET ID	ASSET TYPE	MANUFACTERER	PURCHASE YEAR	CURRENT USE	MAJOR RENEWALS	CONDITION SUMMARY (2021)	EST. UL (Years)	EST. RUL (Years)	% RUL	CONDITION RATING	RENEWAL APPROACH SUMMARY
JOEY D	VESSEL	GREAT LAKES SHIPYARD	2012	River maintenance, Layed up for winter	None identified	450HP Cummins Diesel, operational	100	91	91	EXCELLENT	Long-term operations maintenance planning, engine & generator upgrades/replacement planned for 2060.
SURVEY BOAT, TOBIN H	VESSEL	MONARK 20	1988	Engineering inspections and soundings	Initial asset procurement survey	Average condition per the Superior Marine Survey performed 6/15/2016	100	67	67	GOOD	Long-term operations maintenance planning, recommended near future hull re-painting and long term future engine rebuild.
HARBOR SEAGULL	VESSEL	T.D.VINETTECO , MARINE DIV ESCANABA, MICH	1961	Year round use, icebreaking, navigation aides, river debris clearing, first response support	Rudder tube seal repair, Hull maintenance for ice breaking operations	260HP Cummins Diesel, operational	100	40	40	FAIR	Long-term operations maintenance planning, engine & generator upgrades/replacement planned for 2030

CONDITION AND RENEWAL SUMMARY
UTILITIES

ASSET ID (SUBSYSTEM)	SYSTEM TYPE	TRACT	LENGTH (FEET)	OTHER SYSTEM COMPONENTS (VALVES, HYDRANTS, ETC.)	CONDITION NOTES (2021)	YEAR CONSTRUCTED	ESTIMATED UL (YEARS)	RUL (YEARS)	CONDITION RATING	RENEWAL APPROACH SUMMARY
16-Inch Pipe, West Section of E. Bay Street Main Header East to S. Lincoln Memorial Dr. (Main Meter Pit to Valve #2)	Water Distribution System	South Harbor Tract	250	16-Inch Valve in Pit	Operational but aged	1932	100	11	FAIR	Recommend inspection of piping and valve pit components for potential replacement at end of useful life as required. Valves may require replacement sooner based on shorter useful life due to exposed conditions.
16-Inch Pipe, Middle Section of E. Bay Street Main Header East to S. Lincoln Memorial Dr. (Between Valve #2 to Valve #72)	Water Distribution System	South Harbor Tract	700	16-Inch Valves in Pit, Hydrants	Operational but aged	1950	100	29	GOOD	Near future internal inspection recommended if opportunity during inspections of older west section of system. Recommend inspection of piping and valve pit components for potential replacement at end of useful life as required. Valves and Hydrants may require replacement sooner based on shorter useful life due to exposed conditions.
16-Inch Pipe, East Section of E. Bay Street Main Header East to S. Lincoln Memorial Dr. (Valve #72 to S. Lincoln Memorial Dr.)	Water Distribution System	South Harbor Tract	600	16-Inch Valves in Pit, Hydrants	Operational but aged	1962	100	41	GOOD	Recommend inspection of piping and valve pit components for potential replacement at end of useful life as required.
2-Inch Pipe, Branch South of E. Bay Street Header	Water Distribution System	South Harbor Tract	250	Isolation valve(s)	Operational but aged	1950	100	29	GOOD	Recommend future inspection of piping and valve pit components for potential replacement at end of useful life as required. Valves and Hydrants may require replacement sooner based on shorter useful life due to exposed conditions.
12-Inch Pipe, North Section of S. Carferry Drive Header (North of Valve #16)	Water Distribution System	South Harbor Tract	3,100	12-Inch Valves in Pits, Hydrants	Operational but aged	1932	100	11	FAIR	Recommend inspection of piping and valve pit components for potential replacement at end of useful life as required. Valves and Hydrants may require replacement sooner based on shorter useful life due to exposed conditions.
12-Inch Pipe, Middle Section of S. Carferry Drive Header (South of Valve #16 to E. Bay Street)	Water Distribution System	South Harbor Tract	3,800	12-Inch Valves in Pits, Hydrants	Operational but aged	1960	100	39	GOOD	Near future internal inspection recommended if opportunity during inspections of older west section of system. Recommend inspection of piping and valve pit components for potential replacement at end of useful life as required. Valves and Hydrants may require replacement sooner based on shorter useful life due to exposed conditions.
12-Inch Pipe, South Section of S. Carferry Drive Header (South of E. Bay Street to E. Lincoln Ave.)	Water Distribution System	South Harbor Tract	1,400	12-Inch Valves in Pits, Hydrants	Operational but aged	1967	100	46	GOOD	Recommend future inspection of piping and valve pit components for potential replacement at end of useful life as required. Valves and Hydrants may require replacement sooner based on shorter useful life due to exposed conditions.
12-Inch Pipe, S. Carferry Drive Branch Header to Municipal Mooring Basin Hydrant Pits	Water Distribution System	South Harbor Tract	600	12-Inch Valves in Pits, Hydrants	Operational but aged	1932	100	11	FAIR	Recommend near future inspection of piping and valve pit components for potential replacement at end of useful life as required. Valves and Hydrants may require replacement sooner based on shorter useful life due to exposed conditions.
12-Inch Pipe, Middle Cross-connect Header between S. Carferry Dr. and S. Harbor Dr. Headers (Cross-connect at fire lane rail crossing)	Water Distribution System	South Harbor Tract	200	12-Inch Valves in Pits, Hydrants	Operational but aged	1950	100	29	GOOD	Recommend inspection of piping and valve pit components for potential replacement at end of useful life as required.
12-Inch Pipe, North End Cross-connect Header between S. Carferry Drive and S. Harbor Drive Headers (Cross-connect at MMSD Jones Island WW Plant)	Water Distribution System	South Harbor Tract	350	12-Inch Valves in Pits	Operational	1989	100	68	EXCELLENT	Internal inspection of piping recommended in 2070 unless operating conditions change.
6-Inch Pipe, S. Carferry Drive Header, Branches to Hydrant Pits B, C, E along Bulk Cargo Dock	Water Distribution System	South Harbor Tract	700	Isolation valve(s)	Operational but aged	1950	100	29	GOOD	Recommend inspection of piping and valves for potential replacement at end of useful life as required.
2 and 1.5 - Inch Small Bore Pipe Branches from S. Carferry Drive Header to Bulk Cargo and Heavy Lift Docks	Water Distribution System	South Harbor Tract	1,500	Isolation valve(s)	Operational but aged	1950	100	29	GOOD	Recommend inspection of piping and valves for potential replacement at end of useful life as required.
12-Inch Pipe, S. Harbor Drive Header (Valve #32 at MMSD Waste Water Plant extending South to E. Lincoln Ave.)	Water Distribution System	South Harbor Tract	6,500	12-Inch Valves in Pits, Hydrants	Operational but aged	1950	100	29	GOOD	Recommend inspection of piping and valve pit components for potential replacement at end of useful life as required. Valves and Hydrants may require replacement sooner based on shorter useful life due to exposed conditions. Small sections of header along S. Harbor Drive have already been replaced since original construction. Review operating conditions and inspect system during opportunities for system openings.
12-Inch Pipe, North Cross-connects between S. Harbor Dr. and S. Lincoln Memorial Dr. Headers (North Cross-connect at Scott St. and Service Rd within MMSD Waste Water Plant)	Water Distribution System	South Harbor Tract	2,050	12-Inch Valves in Pits, Hydrants	Operational	1983	100	62	EXCELLENT	Internal inspection of piping recommended in long term future unless operating conditions change.
8-Inch Pipe, S. Harbor Drive Header Branches to Seaman's Club Building and Tanco Terminals	Water Distribution System	South Harbor Tract	250	8-Inch Valves in Pits	Operational but aged	1950	100	29	GOOD	Recommend inspection of piping and valves for potential replacement at end of useful life as required.
6-Inch Pipe, S. Harbor Drive Header Branches to U.S. Oil and Kinder Morgan	Water Distribution System	South Harbor Tract	350	6-Inch Valves in Pits	Operational but aged	1950	100	29	GOOD	Recommend inspection of piping and valves for potential replacement at end of useful life as required.
12-Inch Pipe, North Section S. Lincoln Memorial Drive Header (North Section, South Slip 1 along waterfront down to and including Cross-connect to S. Harbor Rd at service road just North of Liquid Cargo Pier)	Water Distribution System	South Harbor Tract	4,400	12-Inch Valves in Pits, Hydrants	Operational but aged	1950	100	29	GOOD	Recommend inspection of piping and valve pit components for potential replacement at end of useful life as required. Valves and Hydrants may require replacement sooner based on shorter useful life due to exposed conditions. Small sections of header along S. Lincoln Memorial Drive have already been replaced since original construction. Review operating conditions and inspect system during opportunities for system openings.
12-Inch Pipe, S. Lincoln Memorial Drive Header (Middle Section Header, Valve #61 along waterfront South to connection to main header at Valve #68)	Water Distribution System	South Harbor Tract	2,200	12-Inch Valves in Pits, Hydrants	Operational but aged	1962	100	41	GOOD	Recommend inspection of piping and valves for potential replacement at end of useful life as required.
12-Inch Pipe, S. Lincoln Memorial Drive Header (South Section Header, From Main Header Valve #119 along waterfront South USCG to Main Meter Pit at Russell Ave.)	Water Distribution System	South Harbor Tract	2,200	12-Inch Valves in Pits, Hydrants	Operational	1972	100	51	EXCELLENT	Internal inspection of piping recommended in long term future unless operating conditions change.
8-Inch Pipe, S. Lincoln Memorial Drive Header Branch along North side of South Slip 1	Water Distribution System	South Harbor Tract	500	8-Inch Valves in Pits	Operational but aged	1932	100	11	FAIR	Recommend inspection of piping and valve pit components for potential replacement at end of useful life as required. Valves may require replacement sooner based on shorter useful life due to exposed conditions.
8-Inch Pipe, Header along South Pier 1	Water Distribution System	South Harbor Tract	800	8-Inch Valves in Pits, Hydrants	Operational	1966	100	45	GOOD	Recommend inspection of piping and valves for potential replacement at end of useful life as required.

CONDITION AND RENEWAL SUMMARY
UTILITIES

ASSET ID (SUBSYSTEM)	SYSTEM TYPE	TRACT	LENGTH (FEET)	OTHER SYSTEM COMPONENTS (VALVES, HYDRANTS, ETC.)	CONDITION NOTES (2021)	YEAR CONSTRUCTED	ESTIMATED UL (YEARS)	RUL (YEARS)	CONDITION RATING	RENEWAL APPROACH SUMMARY
3 and 1.5 - Inch Pipe, Small Bore Branches along South Pier 1	Water Distribution System	South Harbor Tract	700	Isolation valve(s)	Operational	1973	100	52	EXCELLENT	Internal inspection of piping recommended in long term future unless operating conditions change.
8-Inch Pipe, Header along South Pier 2	Water Distribution System	South Harbor Tract	1,100	8-Inch Valves in Pits, Hydrants	Operational but aged	1950	100	29	GOOD	Recommend inspection of piping and valves for potential replacement at end of useful life as required.
6-Inch Pipe, Header along South Pier 2	Water Distribution System	South Harbor Tract	650	6-Inch Valves in Pits	Operational	1973	100	52	EXCELLENT	Internal inspection of piping recommended in long term future unless operating conditions change.
4-Inch Pipe, Header along South Pier 2	Water Distribution System	South Harbor Tract	900	Isolation valve(s)	Operational	1973	100	52	EXCELLENT	Internal inspection of piping recommended in long term future unless operating conditions change.
3 and 1.5 - Inch Pipe, Small Bore Branches along South Pier 2	Water Distribution System	South Harbor Tract	1,400	Isolation valve(s)	Operational	1973	100	52	EXCELLENT	Internal inspection of piping recommended in long term future unless operating conditions change.
4-Inch Pipe, Water Distribution Header, Municipal Pier Breakwater	Water Distribution System	North Harbor Tract	820	4-Inch Valves in Pits	Operational, Relatively new	2005	100	84	EXCELLENT	Internal inspection of piping recommended in long term future unless operating conditions change.
12-Inch Clay Pipe, S. Carferry Drive Sewermain Header (North Section along City Heavy Lift Dock, Manholes #41 to #44)	Sanitary System	South Harbor Tract	900	Manholes	Operational but aged	1964	60	3	POOR	Recommended inspection in immediate near future, potential replacement at end of useful life as required.
12-Inch Clay Pipe, S. Carferry Drive Sewermain Header (Short Middle Section along Kazube's Park to fire lane rail crossing, Manholes #44 to #46)	Sanitary System	South Harbor Tract	600	Manholes	Operational but aged	1965	60	4	POOR	Recommended inspection in immediate near future, potential replacement at end of useful life as required.
12-Inch Clay Pipe, S. Carferry Drive Sewermain Header (Long Middle Section, from fire lane rail crossing to E. Bay Street, Manholes #46 to #63)	Sanitary System	South Harbor Tract	3,900	Manholes	Operational but aged	1967	60	6	POOR	Recommended inspection in immediate near future, potential replacement at end of useful life as required.
12-Inch Clay Pipe, S. Carferry Drive Sewermain Header (South Section, E. Bay Street south to E. Lincoln Ave., Manholes #63 to #67)	Sanitary System	South Harbor Tract	1,000	Manholes	Operational but aged	1968	60	7	POOR	Recommended inspection in immediate near future, potential replacement at end of useful life as required.
6-Inch Pipe, S. Carferry Drive Header, Sewer Branch to City Heavy Lift Dock, (Header to Manhole # 43A)	Sanitary System	South Harbor Tract	100	Manholes	Operational but aged	1964	60	3	POOR	Recommended inspection in immediate near future, potential replacement at end of useful life as required.
12-Inch Clay Pipe, Cross-connect Sewermain Headers between S. Carferry Drive and S. Lincoln Memorial Drive (Manholes #41 to #1)	Sanitary System	South Harbor Tract	300	Manholes	Operational but aged	1989	60	28	GOOD	Recommend inspection of piping and valves for potential replacement at end of useful life as required.
10-Inch Clay Pipe, Cross-connect Sewermain Headers between S. Carferry Drive and S. Lincoln Memorial Drive (Manholes #1 to #10)	Sanitary System	South Harbor Tract	1,200	Manholes	Operational but aged	1982	60	21	GOOD	Recommend inspection of piping and valves for potential replacement at end of useful life as required.
8-Inch Clay Pipe, Sewermain Cross-connect Header branch to Seaman's Club building (Manholes #5 to #5B)	Sanitary System	South Harbor Tract	150	Manholes	Operational but aged past useful life	1939	60	0	DEFICIENT	Recommended inspection in immediate near future, potential replacement as required, past useful life.
10-Inch Clay Pipe, S. Lincoln Memorial Drive (North Section along waterfront Piers 1 and 2, Manholes #11A to #21)	Sanitary System	South Harbor Tract	1,950	Manholes	Operational but aged past useful life	1946	60	0	DEFICIENT	Recommended inspection in immediate near future, potential replacement as required, past useful life.
10-Inch Clay Pipe, S. Lincoln Memorial Drive Header (South Section from Liquid Cargo Pier to E. Bay Street, Manholes #21 to #31)	Sanitary System	South Harbor Tract	3,000	Manholes	Operational but aged past useful life	1950	60	0	DEFICIENT	Recommended inspection in immediate near future, potential replacement as required, past useful life.
10-Inch Clay Pipe, S. Lincoln Memorial Drive Header (Small North Section at Pier 1, Manholes #10 to #11A)	Sanitary System	South Harbor Tract	420	Manholes	Operational but aged	1968	60	7	POOR	Recommended inspection in immediate near future, potential replacement at end of useful life as required.
10-Inch Clay Pipe, S. Lincoln Memorial Drive Header (Small Section at Milwaukee Bulk Terminal Domed Tanks, Manholes #25D to #25G)	Sanitary System	South Harbor Tract	100	Manholes	Operational but aged	1987	60	26	GOOD	Recommend inspection of piping and valves for potential replacement at end of useful life as required.
8-Inch Clay Pipe, S. Lincoln Memorial Drive Sewermain branch to South Slip 1, (Manholes #7A to # 9A)	Sanitary System	South Harbor Tract	700	Manholes	Operational but aged	1982	60	21	GOOD	Recommend inspection of piping and valves for potential replacement at end of useful life as required.
8-Inch Clay Pipe, S. Lincoln Memorial Drive Sewermain branch to Milwaukee Bulk Terminals building, (Manholes #25 to #25A)	Sanitary System	South Harbor Tract	500	Manholes	Operational but aged	1987	60	26	GOOD	Recommend inspection of piping and valves for potential replacement at end of useful life as required.
4-Inch Clay Pipe, S. Lincoln Memorial Drive Sewermain branch US Oil Milwaukee, (Manhole #21, Just North of South Slip 4, Liquid Cargo Pier)	Sanitary System	South Harbor Tract	200	Manholes	Operational but aged past useful life	1946	60	0	DEFICIENT	Recommended inspection in immediate near future, potential replacement as required, past useful life.
6-Inch Clay Pipe, Sewer Branch to South Pier 1, Terminal 2 (Manholes #11A to #11B)	Sanitary System	South Harbor Tract	200	Manholes	Operational but aged	1966	60	5	POOR	Recommended inspection in immediate near future, potential replacement at end of useful life as required.
8-Inch Clay Pipe, Sewer Branch to South Pier 2 (Manholes #14 to #17)	Sanitary System	South Harbor Tract	450	Manholes	Operational but aged past useful life	1946	60	0	DEFICIENT	Recommended inspection in immediate near future, potential replacement as required, past useful life.
6-Inch Clay Pipe, Sewer Branch to South Pier 2, Terminal 3	Sanitary System	South Harbor Tract	125	Manholes	Operational but aged past useful life	1946	60	0	DEFICIENT	Recommended inspection in immediate near future, potential replacement as required, past useful life.
6-Inch Clay Pipe, Sewer Branch to South Pier 2, Terminal 4	Sanitary System	South Harbor Tract	100	Manholes	Operational but aged past useful life	1946	60	0	DEFICIENT	Recommended inspection in immediate near future, potential replacement as required, past useful life.
4-Inch Pipe, Sanitary Sewer Header, (Sanitary Force Main) Municipal Pier Breakwater	Sanitary System	North Harbor Tract	820	Manholes	Operational, Relatively new	2005	100	84	EXCELLENT	Internal inspection of piping recommended in long term future unless operating conditions change.
8-Inch Perforated Drain Header along S. Carferry Drive at E. Lincoln Ave.	Storm Sewer System	South Harbor Tract	1,100	Manholes	Operational but aged past useful life	1939	60	0	DEFICIENT	Recommended inspection in immediate near future, potential replacement as required, past useful life.
6-Inch Perforated Drain Header along S. Carferry Drive at E. Bay Street	Storm Sewer System	South Harbor Tract	550	Manholes	Operational but aged past useful life	1939	60	0	DEFICIENT	Recommended inspection in immediate near future, potential replacement as required, past useful life.
12-Inch Clay Pipe, S. Carferry Drive Storm Drain Branch to Bulk Cargo Dock	Storm Sewer System	South Harbor Tract	150	Manholes	Operational but aged	1978	60	17	FAIR	Recommended inspection in immediate near future, potential replacement at end of useful life as required.
21-Inch Clay Pipe, Storm Header to City Heavy Lift Dock	Storm Sewer System	South Harbor Tract	50	Manholes	Operational but aged	1966	60	5	POOR	Recommended inspection in immediate near future, potential replacement at end of useful life as required.

CONDITION AND RENEWAL SUMMARY
UTILITIES

ASSET ID (SUBSYSTEM)	SYSTEM TYPE	TRACT	LENGTH (FEET)	OTHER SYSTEM COMPONENTS (VALVES, HYDRANTS, ETC.)	CONDITION NOTES (2021)	YEAR CONSTRUCTED	ESTIMATED UL (YEARS)	RUL (YEARS)	CONDITION RATING	RENEWAL APPROACH SUMMARY
18-Inch Clay Pipe, Storm Header to City Heavy Lift Dock	Storm Sewer System	South Harbor Tract	200	Manholes	Operational but aged	1966	60	5	POOR	Recommended inspection in immediate near future, potential replacement at end of useful life as required.
15-Inch Clay Pipe, Storm Header to City Heavy Lift Dock	Storm Sewer System	South Harbor Tract	400	Manholes	Operational but aged past useful life	1961	60	0	DEFICIENT	Recommended inspection in immediate near future, potential replacement as required, past useful life.
12-Inch Clay Pipe, Storm Header to City Heavy Lift Dock	Storm Sewer System	South Harbor Tract	1,850	Manholes	Operational but aged past useful life	1961	60	0	DEFICIENT	Recommended inspection in immediate near future, potential replacement as required, past useful life.
10-Inch Clay Pipe, Storm Header to City Heavy Lift Dock	Storm Sewer System	South Harbor Tract	150	Manholes	Operational but aged	1967	60	6	POOR	Recommended inspection in immediate near future, potential replacement at end of useful life as required.
42-Inch Clay Pipe, Storm Sewermain Outfall along S. Lincoln Memorial Drive	Storm Sewer System	South Harbor Tract	100	Manholes	Operational but aged	1968	60	7	POOR	Recommended inspection in immediate near future, potential replacement at end of useful life as required.
30-Inch Clay Pipe, Storm Sewermain Outfall along Memorial Drive	Storm Sewer System	South Harbor Tract	200	Manholes	Operational but aged	1968	60	7	POOR	Recommended inspection in immediate near future, potential replacement at end of useful life as required.
27-Inch Clay Pipe, Storm Sewermain Outfall along Memorial Drive	Storm Sewer System	South Harbor Tract	150	Manholes	Operational but aged past useful life	1954	60	0	DEFICIENT	Recommended inspection in immediate near future, potential replacement as required, past useful life.
24-Inch Clay Pipe, Storm Sewermain Outfall along Memorial Drive	Storm Sewer System	South Harbor Tract	75	Manholes	Operational but aged	1966	60	5	POOR	Recommended inspection in immediate near future, potential replacement at end of useful life as required.
18-Inch Clay Pipe, Storm Sewermain Outfall along Memorial Drive	Storm Sewer System	South Harbor Tract	150	Manholes	Operational but aged past useful life	1956	60	0	DEFICIENT	Recommended inspection in immediate near future, potential replacement as required, past useful life.
18-Inch Clay Pipe, Storm Sewermain Outfall along Memorial Drive	Storm Sewer System	South Harbor Tract	600	Manholes	Operational but aged	1989	60	28	GOOD	Recommend inspection of piping and valves for potential replacement at end of useful life as required.
15-Inch Clay Pipe, Storm Sewermain Outfall along Memorial Drive	Storm Sewer System	South Harbor Tract	150	Manholes	Operational but aged past useful life	1956	60	0	DEFICIENT	Recommended inspection in immediate near future, potential replacement as required, past useful life.
15-Inch Clay Pipe, Storm Sewermain Outfall along Memorial Drive	Storm Sewer System	South Harbor Tract	100	Manholes	Operational but aged	1989	60	28	GOOD	Recommend inspection of piping and valves for potential replacement at end of useful life as required.
8/6/4-Inch Small Clay Piping, Storm Sewermain Outfalls along Memorial Drive	Storm Sewer System	South Harbor Tract	1,000	Manholes	Operational but aged	1989	60	28	GOOD	Recommend inspection of piping and valves for potential replacement at end of useful life as required.
8-Inch Perforated Storm Drain along South Pier 1, Terminal 2	Storm Sewer System	South Harbor Tract	2,050	Manholes	Operational but aged	1962	60	1	POOR	Recommended inspection in immediate near future, potential replacement at end of useful life as required.
24-Inch Clay Pipe, Storm Sewermain Outfall South Pier 1, Terminal 2	Storm Sewer System	South Harbor Tract	200	Manholes	Operational but aged	1962	60	1	POOR	Recommended inspection in immediate near future, potential replacement at end of useful life as required.
21-Inch Clay Pipe, Storm Sewermain Outfall South Pier 1, Terminal 2	Storm Sewer System	South Harbor Tract	200	Manholes	Operational but aged	1962	60	1	POOR	Recommended inspection in immediate near future, potential replacement at end of useful life as required.
15-Inch Clay Pipe, Storm Sewermain Outfall South Pier 1, Terminal 2	Storm Sewer System	South Harbor Tract	650	Manholes	Operational but aged	1962	60	1	POOR	Recommended inspection in immediate near future, potential replacement at end of useful life as required.
42-Inch Clay Pipe, Storm Sewermain Outfall South Pier 2, Terminals 3 and 4	Storm Sewer System	South Harbor Tract	150	Manholes	Operational but aged	1962	60	1	POOR	Recommended inspection in immediate near future, potential replacement at end of useful life as required.
36-Inch Clay Pipe, Storm Sewermain Outfall South Pier 2, Terminals 3 and 4	Storm Sewer System	South Harbor Tract	200	Manholes	Operational but aged	1962	60	1	POOR	Recommended inspection in immediate near future, potential replacement at end of useful life as required.
30-Inch Clay Pipe, Storm Sewermain Outfall South Pier 2, Terminals 3 and 4	Storm Sewer System	South Harbor Tract	200	Manholes	Operational but aged	1962	60	1	POOR	Recommended inspection in immediate near future, potential replacement at end of useful life as required.
18-Inch Clay Pipe, Storm Sewermain Outfall South Pier 2, Terminals 3 and 4	Storm Sewer System	South Harbor Tract	800	Manholes	Operational but aged	1962	60	1	POOR	Recommended inspection in immediate near future, potential replacement at end of useful life as required.
12-Inch Clay Pipe, Storm Sewermain Outfall South Pier 2, Terminals 3 and 4	Storm Sewer System	South Harbor Tract	1,900	Manholes	Operational but aged	1962	60	1	POOR	Recommended inspection in immediate near future, potential replacement at end of useful life as required.
6-Inch Clay Pipe, Storm Sewermain Outfall South Pier 2, Terminals 3 and 4	Storm Sewer System	South Harbor Tract	600	Manholes	Operational but aged	1962	60	1	POOR	Recommended inspection in immediate near future, potential replacement at end of useful life as required.
Dry Fire Line, Municipal Pier Breakwater	Fire Suppression Water	North Harbor Tract	820	Manholes	Operational, Relatively new	2005	100	84	EXCELLENT	Internal inspection of piping and system components recommended in long term future unless operating conditions change.

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Notes
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PORT Milwaukee
CONNECTING TO THE WORLD

SOUTH HARBOR TRACT BOUNDARY
CAPITAL ASSET RENEWAL PLAN

PORT MILWAUKEE
SOUTH HARBOR TRACT

MAP 1

RAMBOLL US CONSULTING
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234 W. Florida St. Milwaukee, Wisconsin
RAMBOLL

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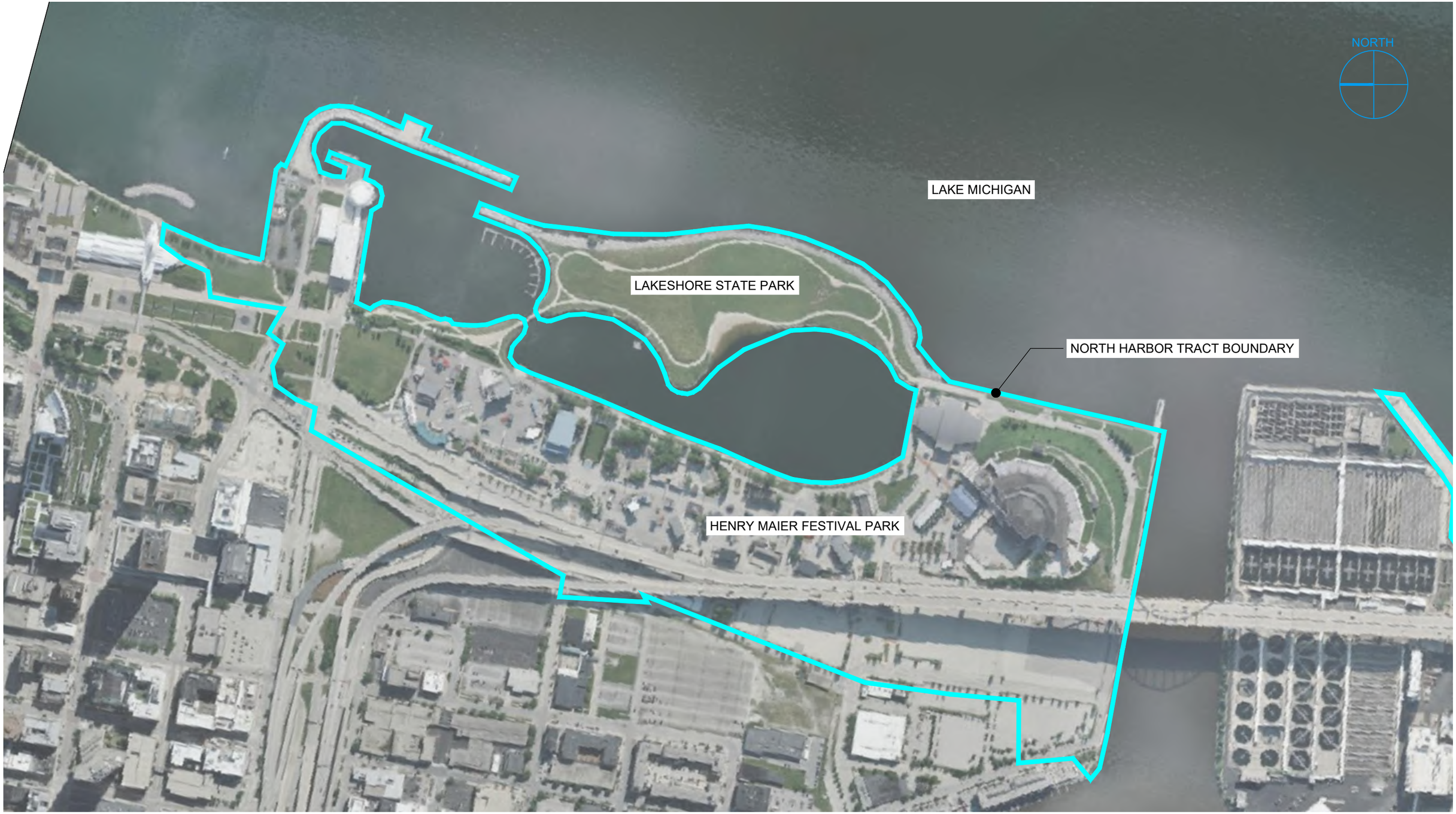

Notes
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PORT Milwaukee
CONNECTING TO THE WORLD

NORTH HARBOR TRACT BOUNDARY
CAPITAL ASSET RENEWAL PLAN

PORT MILWAUKEE
NORTH HARBOR TRACT

MAP 2

RAMBOLL US CONSULTING
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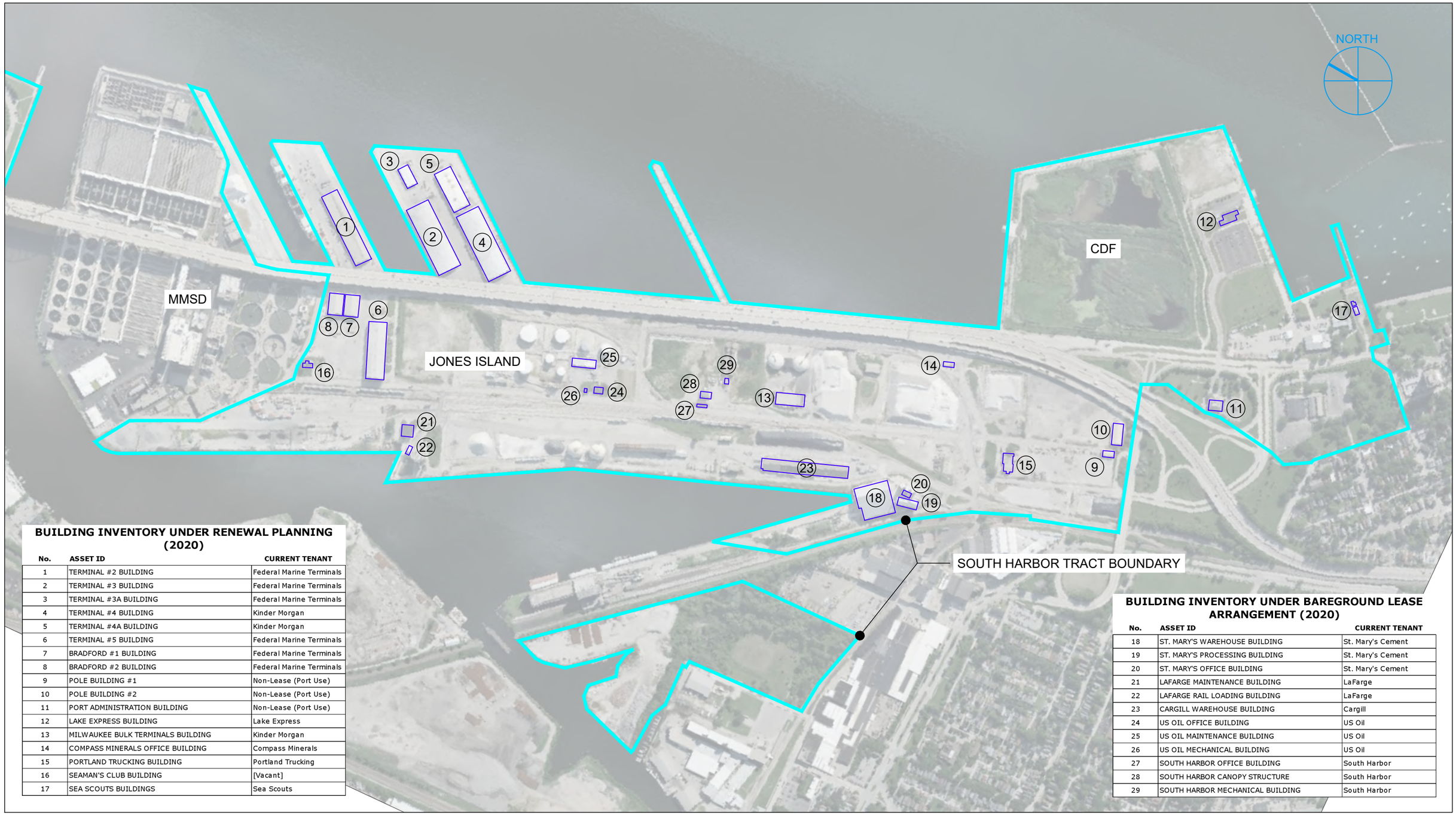

BUILDING INVENTORY UNDER RENEWAL PLANNING (2020)

No.	ASSET ID	CURRENT TENANT
1	TERMINAL #2 BUILDING	Federal Marine Terminals
2	TERMINAL #3 BUILDING	Federal Marine Terminals
3	TERMINAL #3A BUILDING	Federal Marine Terminals
4	TERMINAL #4 BUILDING	Kinder Morgan
5	TERMINAL #4A BUILDING	Kinder Morgan
6	TERMINAL #5 BUILDING	Federal Marine Terminals
7	BRADFORD #1 BUILDING	Federal Marine Terminals
8	BRADFORD #2 BUILDING	Federal Marine Terminals
9	POLE BUILDING #1	Non-Lease (Port Use)
10	POLE BUILDING #2	Non-Lease (Port Use)
11	PORT ADMINISTRATION BUILDING	Non-Lease (Port Use)
12	LAKE EXPRESS BUILDING	Lake Express
13	MILWAUKEE BULK TERMINALS BUILDING	Kinder Morgan
14	COMPASS MINERALS OFFICE BUILDING	Compass Minerals
15	PORTLAND TRUCKING BUILDING	Portland Trucking
16	SEAMAN'S CLUB BUILDING	[Vacant]
17	SEA SCOUTS BUILDINGS	Sea Scouts

BUILDING INVENTORY UNDER BAREGROUND LEASE ARRANGEMENT (2020)

No.	ASSET ID	CURRENT TENANT
18	ST. MARY'S WAREHOUSE BUILDING	St. Mary's Cement
19	ST. MARY'S PROCESSING BUILDING	St. Mary's Cement
20	ST. MARY'S OFFICE BUILDING	St. Mary's Cement
21	LAFARGE MAINTENANCE BUILDING	LaFarge
22	LAFARGE RAIL LOADING BUILDING	LaFarge
23	CARGILL WAREHOUSE BUILDING	Cargill
24	US OIL OFFICE BUILDING	US Oil
25	US OIL MAINTENANCE BUILDING	US Oil
26	US OIL MECHANICAL BUILDING	US Oil
27	SOUTH HARBOR OFFICE BUILDING	South Harbor
28	SOUTH HARBOR CANOPY STRUCTURE	South Harbor
29	SOUTH HARBOR MECHANICAL BUILDING	South Harbor

Notes

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PORT Milwaukee
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BUILDING ASSET INVENTORY

CAPITAL ASSET RENEWAL PLAN

PORT MILWAUKEE
SOUTH HARBOR TRACT

MAP 3

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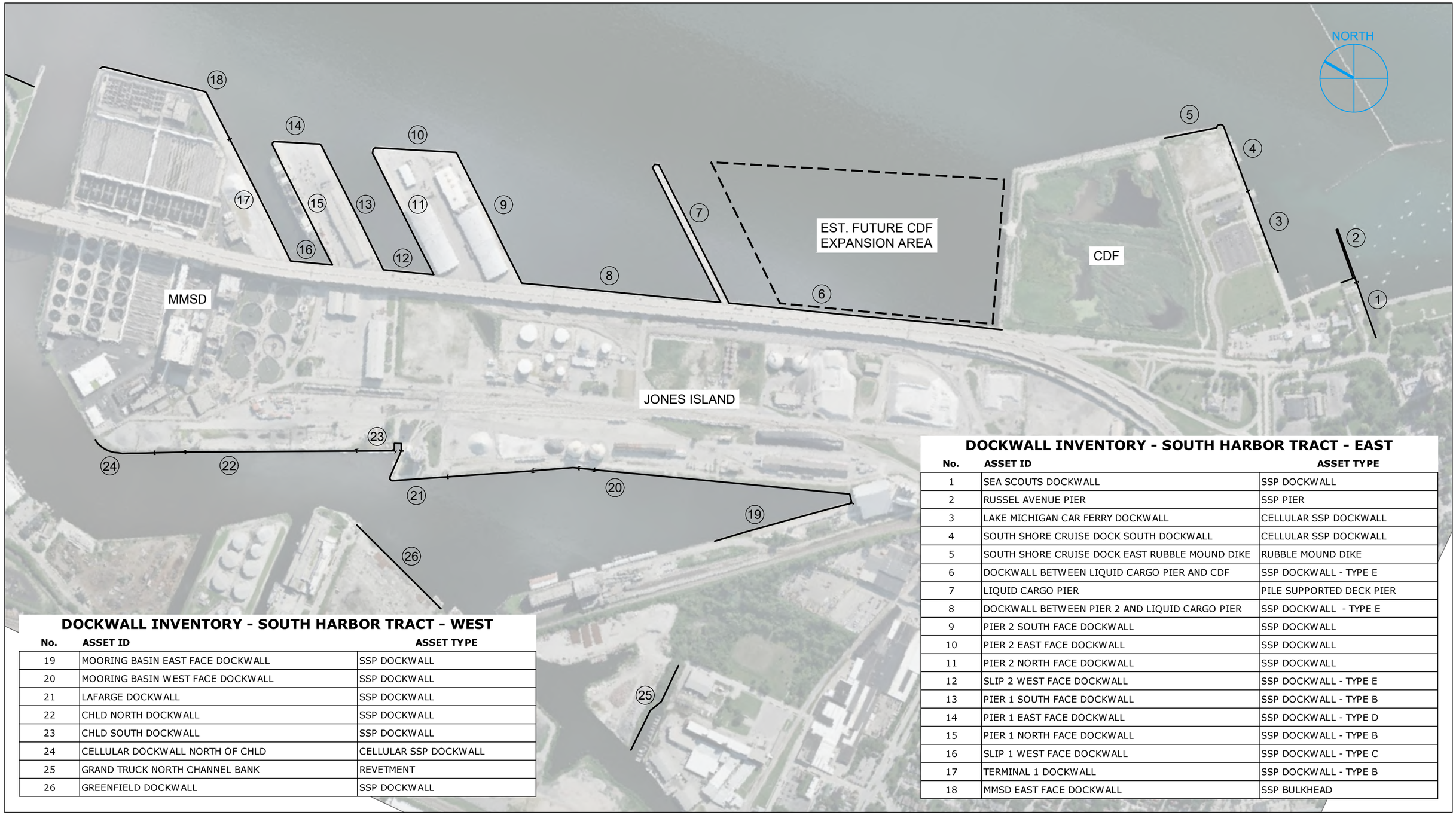

DOCKWALL INVENTORY - SOUTH HARBOR TRACT - WEST

No.	ASSET ID	ASSET TYPE
19	MOORING BASIN EAST FACE DOCKWALL	SSP DOCKWALL
20	MOORING BASIN WEST FACE DOCKWALL	SSP DOCKWALL
21	LAFARGE DOCKWALL	SSP DOCKWALL
22	CHLD NORTH DOCKWALL	SSP DOCKWALL
23	CHLD SOUTH DOCKWALL	SSP DOCKWALL
24	CELLULAR DOCKWALL NORTH OF CHLD	CELLULAR SSP DOCKWALL
25	GRAND TRUCK NORTH CHANNEL BANK	REVETMENT
26	GREENFIELD DOCKWALL	SSP DOCKWALL

DOCKWALL INVENTORY - SOUTH HARBOR TRACT - EAST

No.	ASSET ID	ASSET TYPE
1	SEA SCOUTS DOCKWALL	SSP DOCKWALL
2	RUSSEL AVENUE PIER	SSP PIER
3	LAKE MICHIGAN CAR FERRY DOCKWALL	CELLULAR SSP DOCKWALL
4	SOUTH SHORE CRUISE DOCK SOUTH DOCKWALL	CELLULAR SSP DOCKWALL
5	SOUTH SHORE CRUISE DOCK EAST RUBBLE MOUND DIKE	RUBBLE MOUND DIKE
6	DOCKWALL BETWEEN LIQUID CARGO PIER AND CDF	SSP DOCKWALL - TYPE E
7	LIQUID CARGO PIER	PILE SUPPORTED DECK PIER
8	DOCKWALL BETWEEN PIER 2 AND LIQUID CARGO PIER	SSP DOCKWALL - TYPE E
9	PIER 2 SOUTH FACE DOCKWALL	SSP DOCKWALL
10	PIER 2 EAST FACE DOCKWALL	SSP DOCKWALL
11	PIER 2 NORTH FACE DOCKWALL	SSP DOCKWALL
12	SLIP 2 WEST FACE DOCKWALL	SSP DOCKWALL - TYPE E
13	PIER 1 SOUTH FACE DOCKWALL	SSP DOCKWALL - TYPE B
14	PIER 1 EAST FACE DOCKWALL	SSP DOCKWALL - TYPE D
15	PIER 1 NORTH FACE DOCKWALL	SSP DOCKWALL - TYPE B
16	SLIP 1 WEST FACE DOCKWALL	SSP DOCKWALL - TYPE C
17	TERMINAL 1 DOCKWALL	SSP DOCKWALL - TYPE B
18	MMSD EAST FACE DOCKWALL	SSP BULKHEAD

Notes
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PORT Milwaukee
CONNECTING TO THE WORLD

DOCKWALL ASSET INVENTORY
CAPITAL ASSET RENEWAL PLAN

PORT MILWAUKEE
SOUTH HARBOR TRACT

MAP 4

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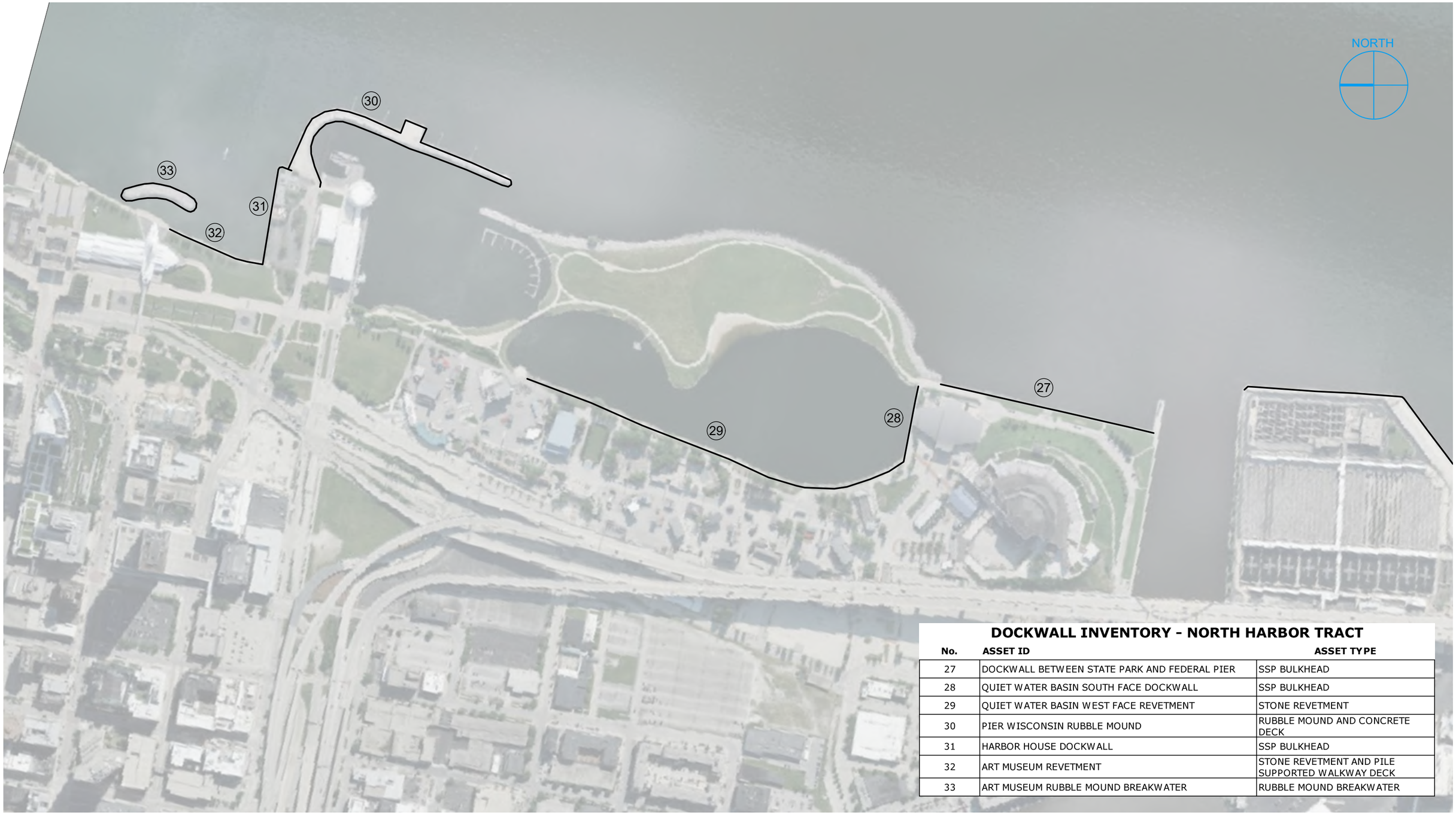

DOCKWALL INVENTORY - NORTH HARBOR TRACT

No.	ASSET ID	ASSET TYPE
27	DOCKWALL BETWEEN STATE PARK AND FEDERAL PIER	SSP BULKHEAD
28	QUIET WATER BASIN SOUTH FACE DOCKWALL	SSP BULKHEAD
29	QUIET WATER BASIN WEST FACE REVETMENT	STONE REVETMENT
30	PIER WISCONSIN RUBBLE MOUND	RUBBLE MOUND AND CONCRETE DECK
31	HARBOR HOUSE DOCKWALL	SSP BULKHEAD
32	ART MUSEUM REVETMENT	STONE REVETMENT AND PILE SUPPORTED WALKWAY DECK
33	ART MUSEUM RUBBLE MOUND BREAKWATER	RUBBLE MOUND BREAKWATER

Notes
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PORT Milwaukee
CONNECTING TO THE WORLD

DOCKWALL ASSET INVENTORY
CAPITAL ASSET RENEWAL PLAN

PORT MILWAUKEE
NORTH HARBOR TRACT

MAP 5

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SLIP 1 (5.29 AC)
DREDGE DEPTH 27 FT

SLIP 2 (6.55 AC)
DREDGE DEPTH 27 FT

SLIP 3 (7.38 AC)
DREDGE DEPTH 27 FT

FEDERAL HARBOR
AUTHORIZED DEPTH 28 FT

SOUTH SHORE CRUISE DOCK /
LAKE EXPRESS CAR FERRY
AREA (20.54 AC)
DREDGE DEPTH 17 FT

NORTH

MMSD

CDF

LIQUID CARGO PIER (15.30 AC)
DREDGE DEPTH 27 FT

CITY HEAVY LIFT DOCK (2.08 AC)
DREDGE DEPTH 27 FT

JONES ISLAND

MUNICIPAL MOORING BASIN (33.31 AC)
DREDGE DEPTH 27 FT

FEDERAL HARBOR
AUTHORIZED DEPTH 27 FT

SOUTH HARBOR TRACT BOUNDARY

GREENFIELD DOCK (1.43 AC)
DREDGE DEPTH 27 FT

GRAND TRUNK SLIP (2.70 AC)
DREDGE DEPTH 17 FT

Notes
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PORT Milwaukee
CONNECTING TO THE WORLD

NAVIGATIONAL AREA ASSET INVENTORY
CAPITAL ASSET RENEWAL PLAN

PORT MILWAUKEE
SOUTH HARBOR TRACT

MAP 6

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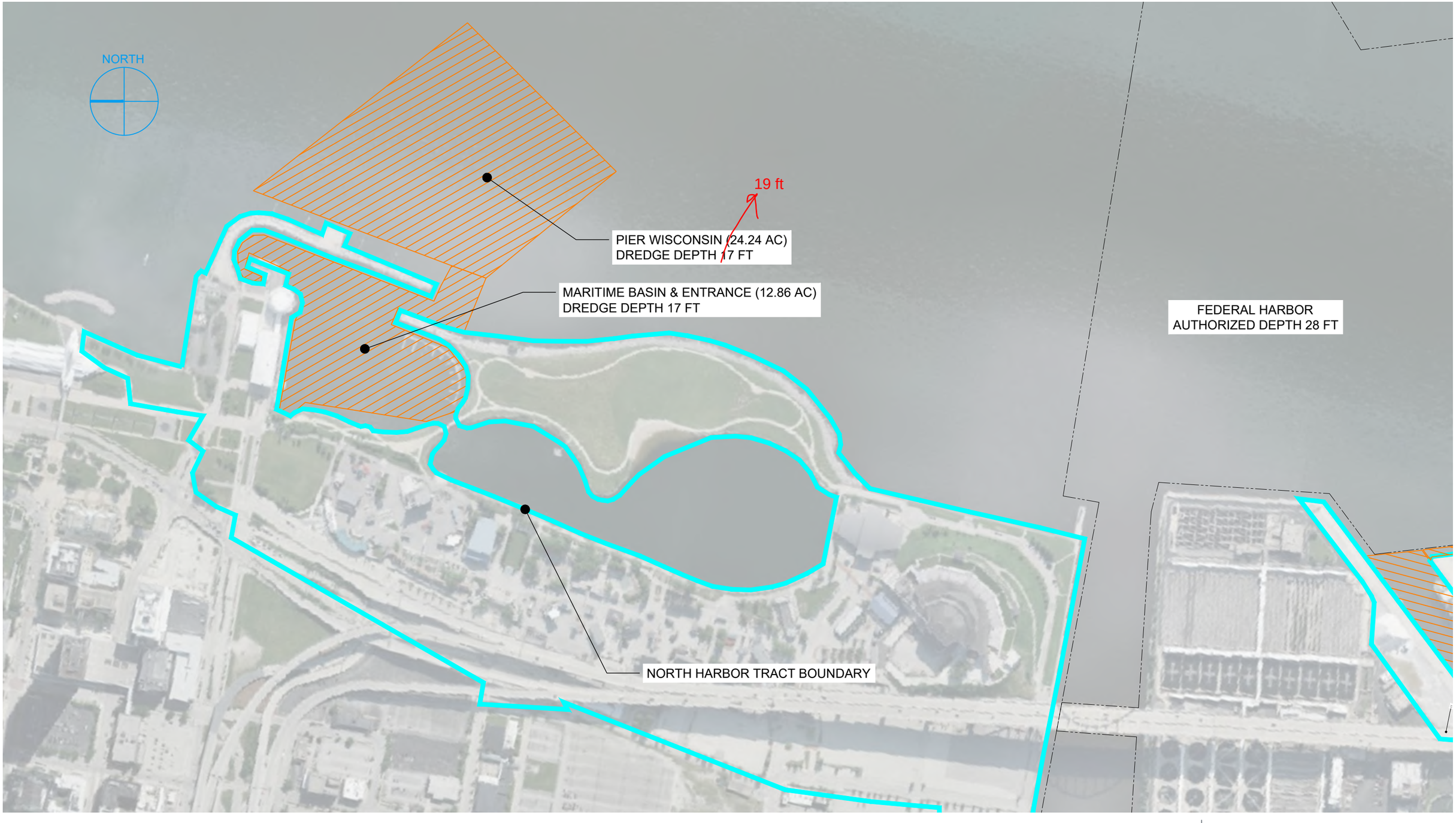

Notes
1. DRAWING NOT TO SCALE

PORT Milwaukee
CONNECTING TO THE WORLD

NAVIGATIONAL AREA ASSET INVENTORY
CAPITAL ASSET RENEWAL PLAN

PORT MILWAUKEE
NORTH HARBOR TRACT

MAP 7

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PORT Milwaukee
CONNECTING TO THE WORLD

FENCING ASSET INVENTORY
CAPITAL ASSET RENEWAL PLAN

PORT MILWAUKEE
SOUTH HARBOR TRACT

MAP 8

RAMBOLL US CONSULTING
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RAMBOLL

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Notes
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LIGHTING ASSET INVENTORY
CAPITAL ASSET RENEWAL PLAN

PORT MILWAUKEE
SOUTH HARBOR TRACT

FIGURE 9

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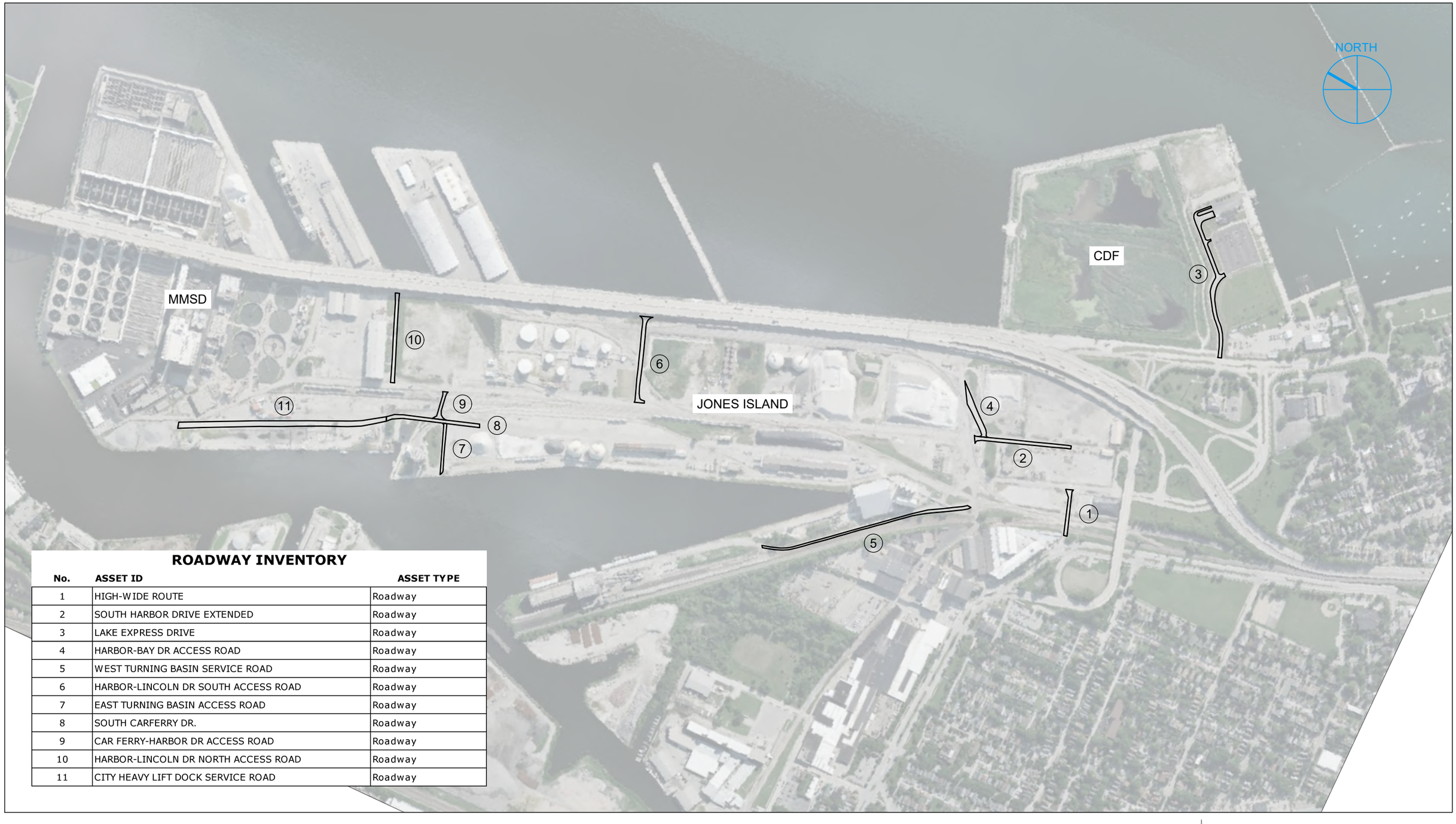

ROADWAY INVENTORY

No.	ASSET ID	ASSET TYPE
1	HIGH-WIDE ROUTE	Roadway
2	SOUTH HARBOR DRIVE EXTENDED	Roadway
3	LAKE EXPRESS DRIVE	Roadway
4	HARBOR-BAY DR ACCESS ROAD	Roadway
5	WEST TURNING BASIN SERVICE ROAD	Roadway
6	HARBOR-LINCOLN DR SOUTH ACCESS ROAD	Roadway
7	EAST TURNING BASIN ACCESS ROAD	Roadway
8	SOUTH CARFERRY DR.	Roadway
9	CAR FERRY-HARBOR DR ACCESS ROAD	Roadway
10	HARBOR-LINCOLN DR NORTH ACCESS ROAD	Roadway
11	CITY HEAVY LIFT DOCK SERVICE ROAD	Roadway

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Notes
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PORT Milwaukee
CONNECTING TO THE WORLD

ROADWAY ASSET INVENTORY
CAPITAL ASSET RENEWAL PLAN

PORT MILWAUKEE
SOUTH HARBOR TRACT

MAP 10

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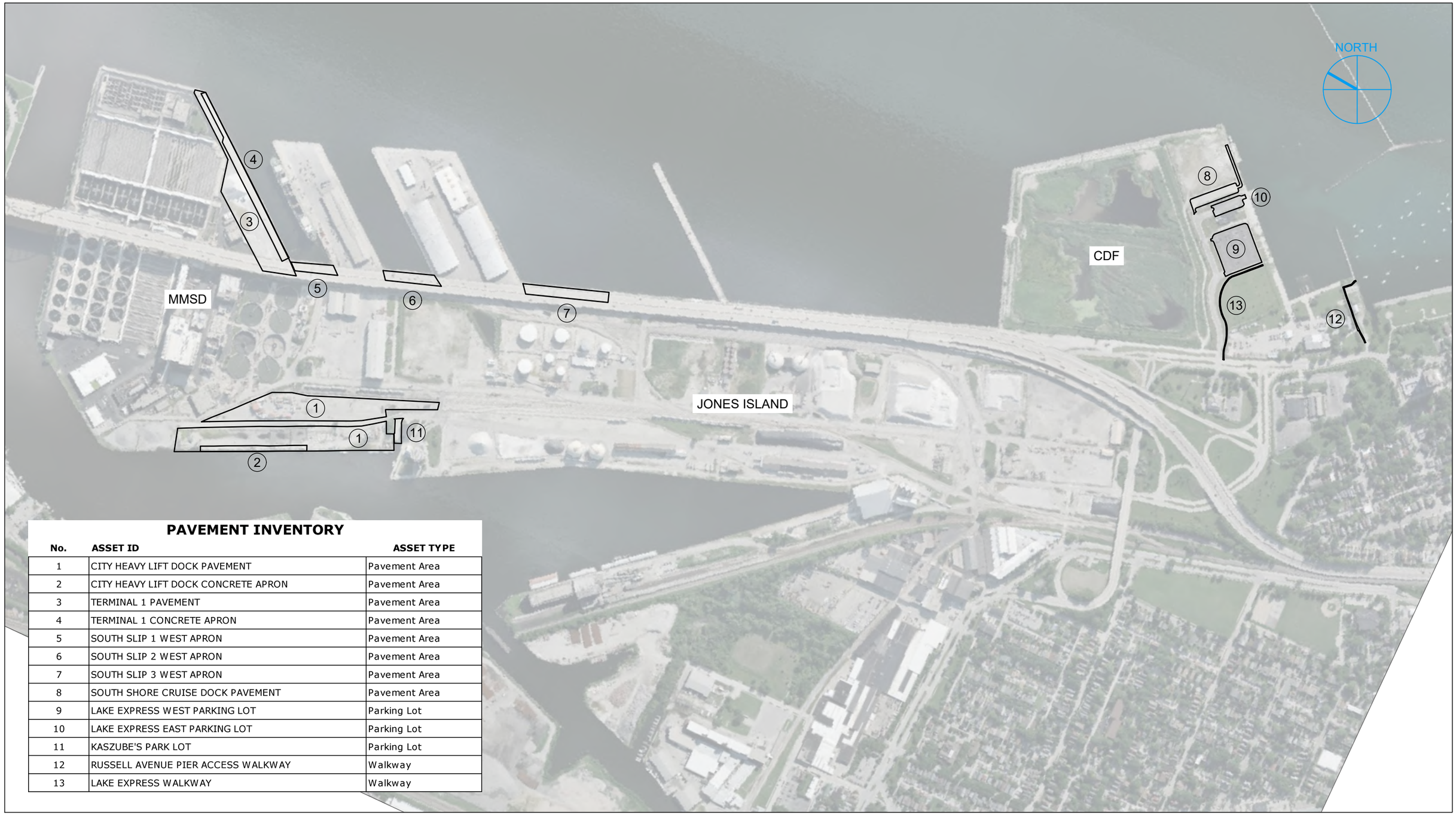

PAVEMENT INVENTORY

No.	ASSET ID	ASSET TYPE
1	CITY HEAVY LIFT DOCK PAVEMENT	Pavement Area
2	CITY HEAVY LIFT DOCK CONCRETE APRON	Pavement Area
3	TERMINAL 1 PAVEMENT	Pavement Area
4	TERMINAL 1 CONCRETE APRON	Pavement Area
5	SOUTH SLIP 1 WEST APRON	Pavement Area
6	SOUTH SLIP 2 WEST APRON	Pavement Area
7	SOUTH SLIP 3 WEST APRON	Pavement Area
8	SOUTH SHORE CRUISE DOCK PAVEMENT	Pavement Area
9	LAKE EXPRESS WEST PARKING LOT	Parking Lot
10	LAKE EXPRESS EAST PARKING LOT	Parking Lot
11	KASZUBE'S PARK LOT	Parking Lot
12	RUSSELL AVENUE PIER ACCESS WALKWAY	Walkway
13	LAKE EXPRESS WALKWAY	Walkway

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Notes

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PORT Milwaukee
CONNECTING TO THE WORLD

PAVEMENT AREA ASSET INVENTORY

CAPITAL ASSET RENEWAL PLAN

PORT MILWAUKEE
SOUTH HARBOR TRACT

MAP 11

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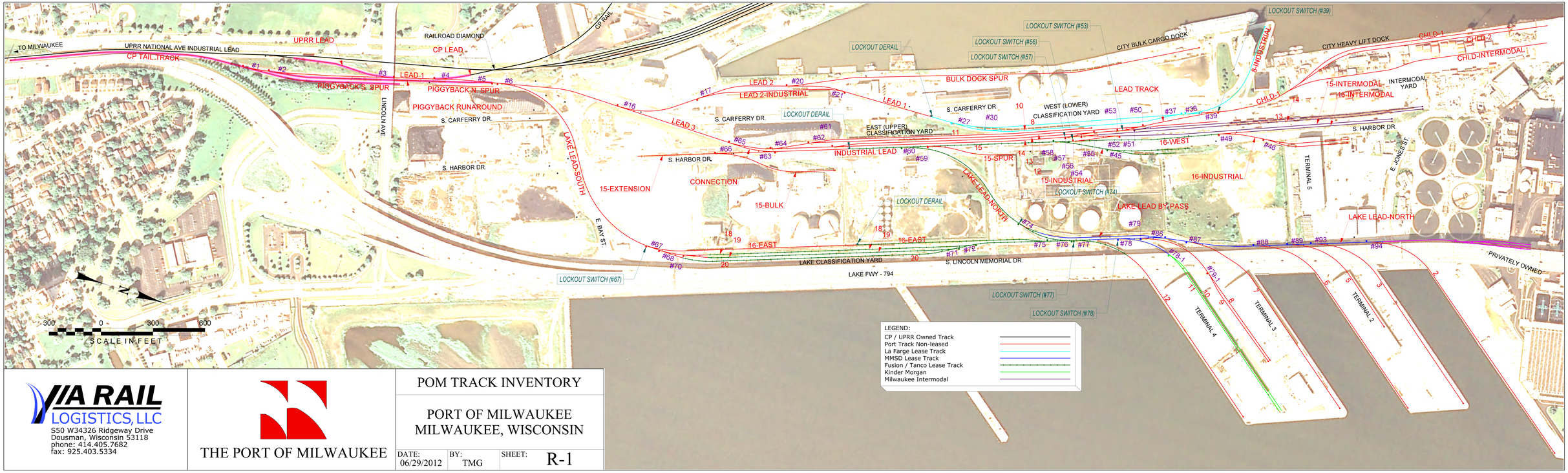
RAMBOLL



VIA RAIL LOGISTICS, LLC
S50 W34326 Ridgeway Drive
Dousman, Wisconsin 53118
phone: 414.405.7682
fax: 925.403.5334

THE PORT OF MILWAUKEE

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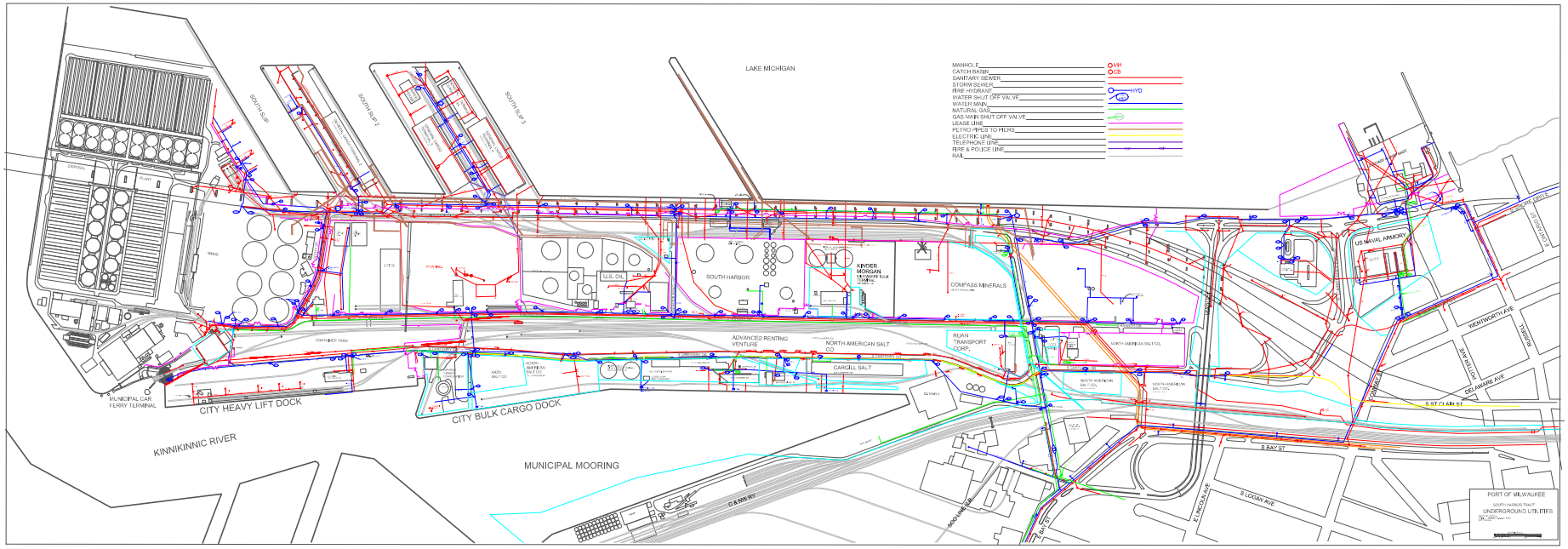
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NATURAL GAS
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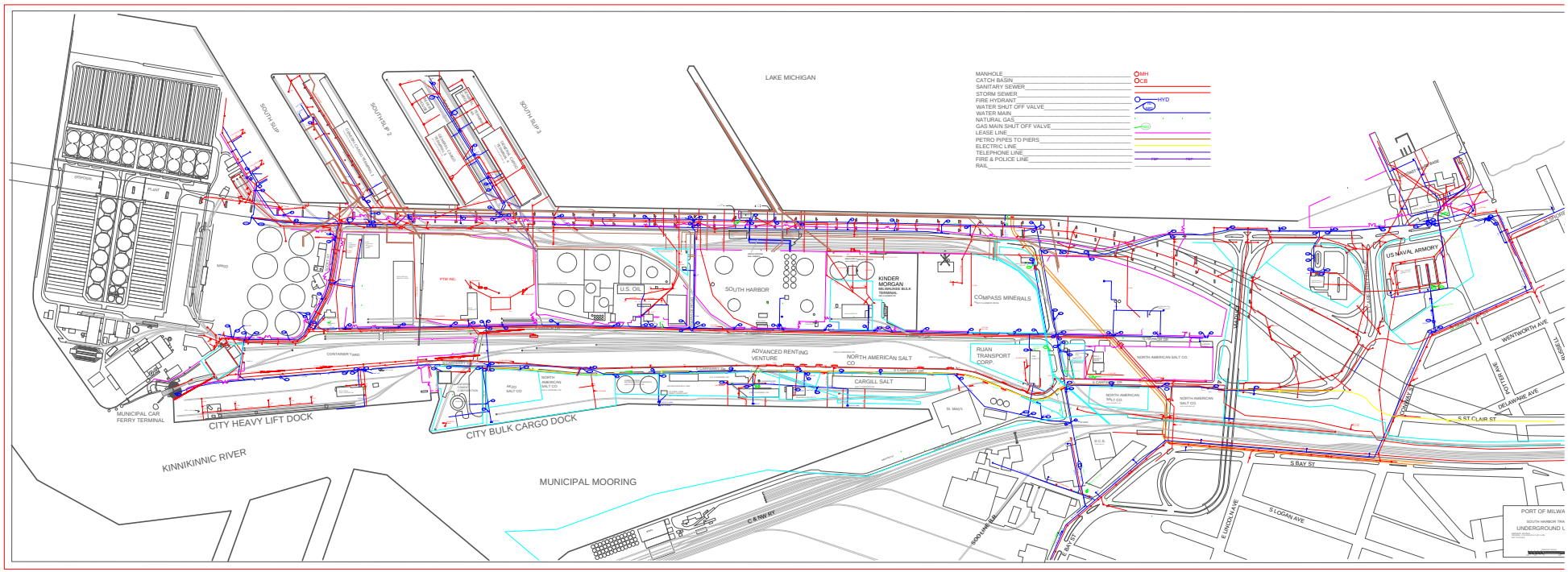
SOUTH HARBOR TRACT
UNDERGROUND UTILITIES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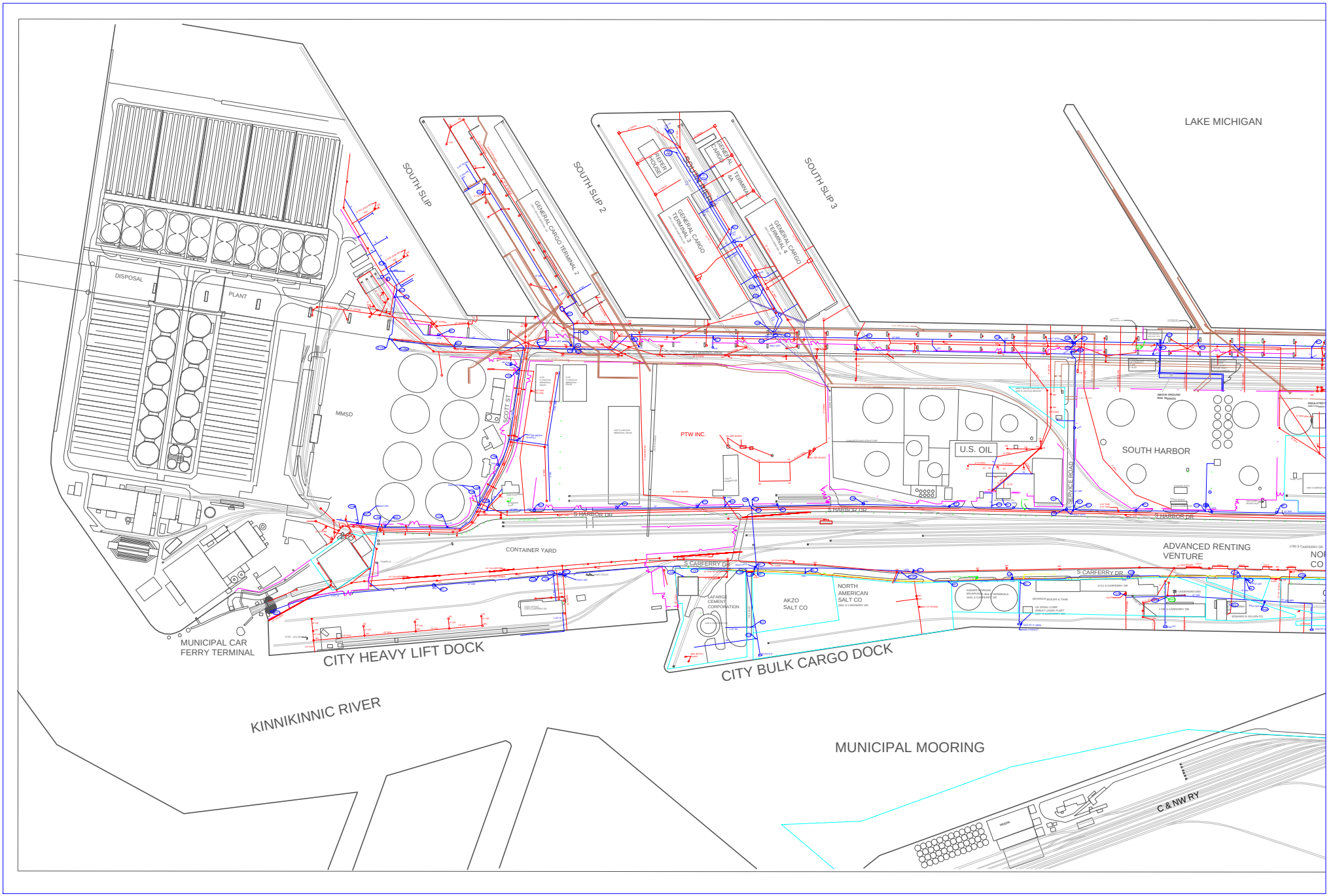
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CONTAINER YARD
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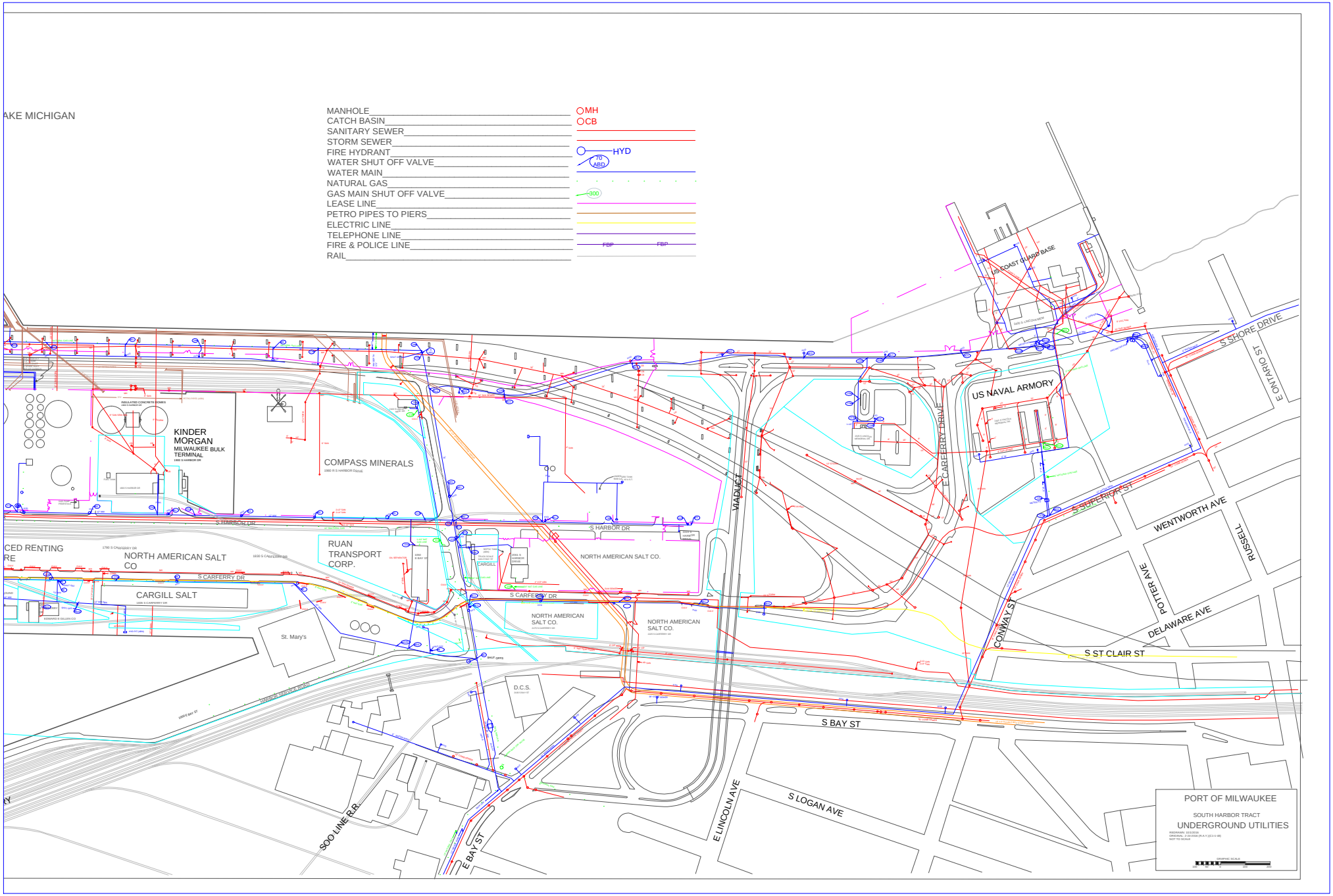
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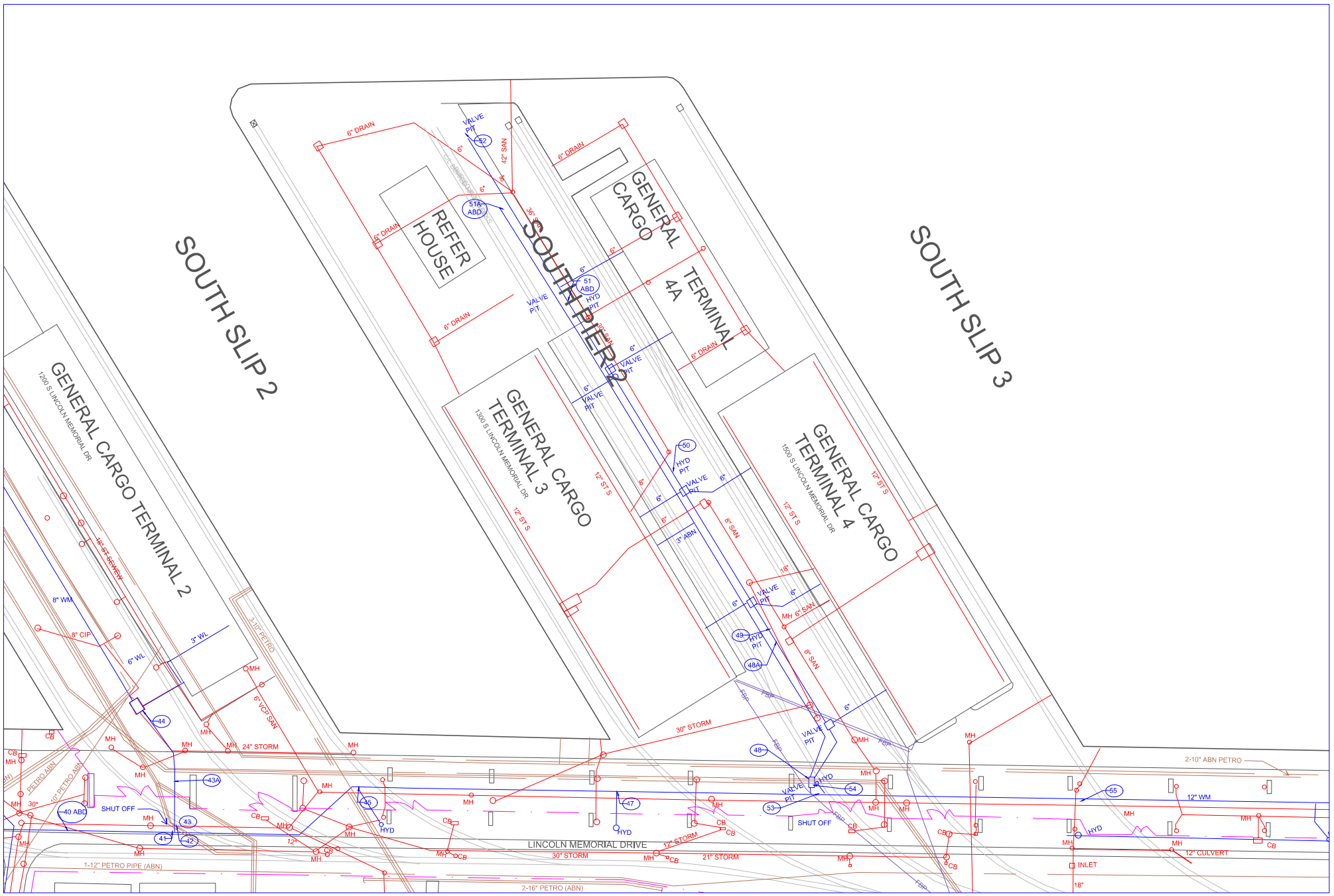
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REFER HOUSE
GENERAL CARGO TERMINAL 4A
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42" SAN
36" SAN
12" ST S
8" SAN
6" SAN
3" ABN
18" ST SEWER
8" WM
8" CIP
6" WL
3" WL
6" VCP SAN
3-10" PETRO
24" STORM
30" STORM
21" STORM
12" STORM
12" WM
12" CULVERT
2-10" ABN PETRO
1-12" PETRO PIPE (ABN)
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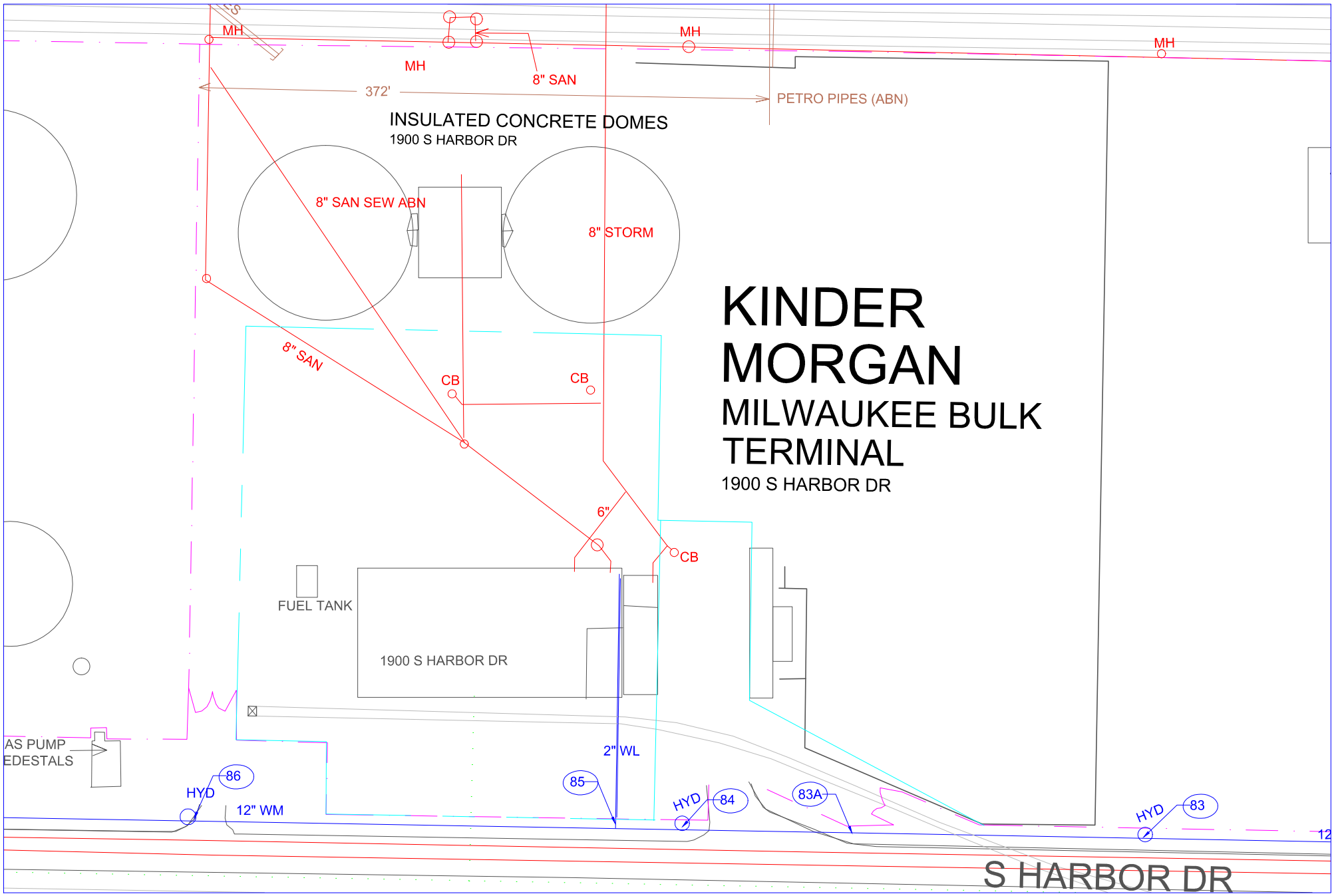
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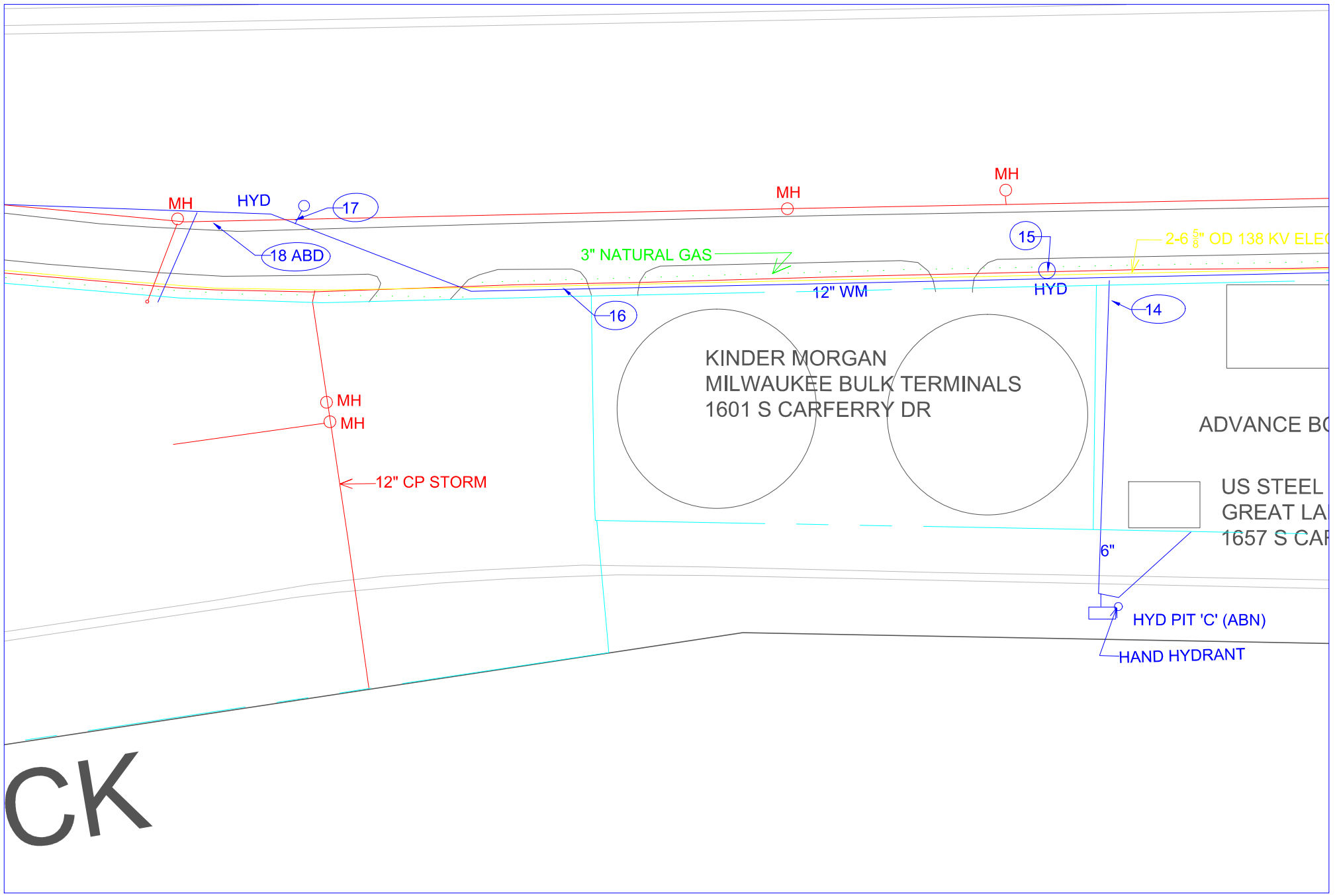
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KINDER MORGAN
MILWAUKEE BULK TERMINALS
1601 S CARFERRY DR
ADVANCE BC
MH
MH
12" CP STORM
US STEEL
GREAT LA
1657 S CAR
6"
HYD PIT 'C' (ABN)
HAND HYDRANT
CK

APPENDIX A
COASTAL MANAGEMENT FRAMEWORK

Prepared for
Port Milwaukee

Date
August 2021

CAPITAL ASSET RENEWAL PLAN
COASTAL MANAGEMENT FRAMEWORK

RAMBOLL Bright ideas. Sustainable change.

CAPITAL ASSET RENEWAL PLAN
COASTAL MANAGEMENT FRAMEWORK

Project name	**Capital Asset Renewal Plan / Coastal Management Framework**
Recipient	**Port Milwaukee**
Version	**Final**
Date	**August 2021**
Description	**Coastal Management Framework Prepared as Supplement to Capital Asset Renewal Plan**

Ramboll
234 W. Florida Street
Fifth Floor
Milwaukee, WI 53204
USA

T 414-837-3607
F 414-837-3608
https://ramboll.com

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1. INTRODUCTION

Port Milwaukee developed a Capital Asset Renewal Plan (CARP) in 2021 that covered an initial planning horizon of 50-years, or through year 2070. The CARP is a component of the Port's overall asset management system and is planned for regular update and improvement. This Coastal Management Framework was developed as a companion to the CARP.

1.1 Purpose

The purpose of this Coastal Management Framework is to identify the current and projected coastal processes affecting Port Milwaukee assets and provide a framework for long term strategic asset renewal planning and mitigation of risks to vulnerable waterfront assets.

1.2 Scope

The scope of this Coastal Management Framework includes:

- Assess Lake Michigan coastal processes affecting Port Milwaukee and identify vulnerable assets.
- Evaluate historic data as well as available studies and reports to determine predictive planning parameters for key coastal factors (i.e. likely high and low water levels for Lake Michigan) over the renewal planning period.
- Provide high level guidance for planning asset management strategies that incorporate coastal protection and resiliency specific to Port Milwaukee assets impacted by Lake Michigan.

2. COASTAL PROCESSES IMPACTING PORT ASSETS

Coastal processes of the Great Lakes affect maintenance and replacement planning of waterfront facilities. Port Milwaukee waterfront assets are primarily affected by Lake Michigan water levels, storm surge, and wave action. Port Milwaukee is situated within the protection area of the federal breakwater of Milwaukee Harbor and therefore the coastal process of long-shore sediment transport is not a major factor in Port asset renewal planning and is not considered here. The Milwaukee Harbor breakwater also serves to dampen the impacts of wave action on Port assets. Wave heights experienced at the Port facilities are reduced by the presence of the breakwater from what they would otherwise be if the breakwater were not present. Long term asset planning should assume continued protection being provided by the breakwater structure. Many factors influence lake levels, including precipitation, evaporation, anthropogenic uses (diversion, consumption, etc.), and water level regulation structures. Air temperature, wind, and barometric pressure also influence water level as well as storm surge and wave heights in the Great Lakes. Long term trends of a changing climate also play a role in those factors affecting lake levels, storm surge, and wave heights. Lake seiche also has a minor influence on lake levels. Seiche are typically caused when strong winds and rapid changes in atmospheric pressure push water from one side of the lake to the other. The typical height of lake seiche is on the order of inches and has a typical duration of minutes to hours.

Lake levels vary as the result of annual and decadal evaporation and rainfall cycles, as well as anthropogenic activities, as described in Section 2.1. Coastal flooding is primarily the result of

storm-induced surge and waves, as described in Section 2.2. Tidal forces on the Great Lakes is only 1 to 2 inches (Melby, 2012), and therefore are not a significant consideration for coastal resiliency. Anthropogenic diversions also have a small impact on the Great Lakes system (IA Report, 2018).

2.1 Water Levels

Lake levels are a complex balance between input and output from the Great Lakes basin, mainly driven by precipitation and evaporation. Short-term water level fluctuations occur during storm events as well as seasonally. Lake levels vary seasonally with the lowest levels in the winter and highest in the summer. Long-term fluctuations occur over a period of years where continuous wet and cold years cause water levels to rise and consecutive warm and dry years cause water levels to decline. A long-term rebounding of the earth's crust following retreat of the glaciers in the last ice age, known as glacial isostatic adjustment (GIA), also plays a role in long-term water level trends.

2.2 Storm Surge and Waves

Storm events not only result in an increase in precipitation affecting the overall lake level, but also cause storm surge and wave inundation that affect the coast. Storm surge can be defined as: "High winds blowing in a specific direction can develop significant shear stress on the water surface producing large waves. The shear stresses, combined with pressure differentials, can cause water to pile up on the shoreline" (Melby, 2012). The degree of impacts of storm surge and wave inundation depends on the overall lake level, ice cover present and storm conditions (i.e. wind speed, direction, duration, and barometric pressure). Storm surge is an added height above lake level. For the Milwaukee area, a storm surge of 2 feet would be considered an extreme event. An additional 2 feet of water on top of a low or average lake elevation will have less potential impact on structures than a 2-foot surge on top of a high lake level condition.

3. PROJECTED COASTAL FACTORS FOR ASSET RENEWAL PLANNING

This section summarizes information derived from available studies and reports used for projecting long-term coastal conditions most likely to be experienced by Port Milwaukee assets. Coastal processes evaluated primarily include long term projections of lake levels, storm surge, and storm driven wave heights. A recommended planning range for lake elevations is provided.

All water levels are referenced to the most recent datum, IGLD85 (likely to be updated soon – see *Effect of Isostatic Rebound* discussion in Section 3.1). The nearest National Oceanic and Atmospheric Administration (NOAA) water level gage to Port Milwaukee is Milwaukee Station No. 9087057.

3.1 Lake Levels

The best available studies and data were reviewed to predict future Lake Michigan water level changes for Milwaukee. This includes seasonal and long-term fluctuations based on evaluation of historic data, as well as predictions of water level changes under future climate change models. Summaries for Lake Michigan water levels are provided in tables in below.

Table 1 - Lake Michigan Water Levels (Lake-Wide)

Summary of Lake-Wide Levels (ft, IGLD 85)
➢ Seasonal fluctuations average 12 to 20 inches with low water in the winter and higher water levels in summer.[1]
➢ Monthly water levels vary 2-3 feet above or below the long-term monthly average. [1]
➢ Annual average water levels range 6.5 feet over recorded time. [1]
➢ Several year periods of high or low levels are normal feature of Great Lakes water levels dynamics but are difficult to predict. [1]
➢ Lake Michigan Low Water Datum (LWD) Elevation of 1985 is 577.5
➢ All-time record high lake level is 582.35 (Monthly, 1918-2020) [2]
➢ All-time record low lake level is 576.02 (Monthly, 1918-2020) [2]

Table References:

1. Great Lakes Water Levels Integrated Assessment Report (2018)
2. The Great Lakes Dashboard

Table 2 -Lake Michigan Water Levels Near Milwaukee, Melby (2012)

Summary of Lake Levels Near Milwaukee (ft, IGLD 85)
➢ Highest recorded lake level is 583.4 (1838)
➢ Long-term Lake Michigan lake level statistics: o Mean of Monthly Averages - 579.2 o Max. of Monthly Averages - 583.3 o Min. of Monthly Averages - 575.9 o Standard deviation of monthly averages - 1.3
➢ 100-year return lake level (1% exceedance) - 583.3
➢ 500-year return lake level (0.2% exceedance) - 583.8

Climate change is predicted to raise air temperatures, however current studies are uncertain regarding how long-term changes in regional climate will affect future water levels in the Great Lakes. Numerous studies have projected changes in the Great Lakes water levels under alternative climate scenarios. The Great Lakes Water Level Dashboard maintained by NOAA's Great Lakes Environmental Research Laboratory provides projected water levels from four different studies [Angel (2010), Hayhoe (2010), Lofgren (2011), MacKay (2012)]. Each study uses similar climate predictive base models with varying temperature and precipitation scenarios. The water level predictions of all the models through year 2070 are summarized in Table 3. Of the studies, the highest and lowest modeled lake levels were found in Lofgren's work which are referenced.

Table 3 – Summary of Long-Term Projected Lake Levels Through 2070, IGLD 85

	HIGH	LOW
Highest and Lowest Modeled Lake Levels	581.55 (Lofgren, CGCM3-EA)	572.44 (Lofgren, GFDL20-TA)
Average Lake Levels from all Models Reviewed	579.25 (Range: 577.71 to 581.55)	577.5 (Range: 572.44 to 579.4)

Based on the summary of predicted lake levels provided in Table 3, a few observations can be made:

- The average of the modeled low lake levels is 577.5 which coincides with the current elevation of low water datum IGLD 85. This would suggest a prediction of typical low lake levels through 2070 as has been historically experienced.
- The low water elevation of 572.44 predicted by Lofgren is a very low lake level and if experienced in the future would have wider implications on operation and maintenance of the Great Lakes Navigation System. Other changes to the system would likely be required in addition to dredging slips and channels to accommodate Seaway maximum depths at this low elevation.
- The highest projected monthly average (581.55) is below both the record high level for the lake-wide basin (582.35) and the maximum monthly averages observed near Milwaukee (583.3). This would suggest that asset planning for lake levels above those historically experienced at Port Milwaukee can be limited at this time with low risk.

Overall, long term lake levels are predicted to remain relatively stationary over the next 50 years. Any deviation from long term averages would like trend downward due to change in climate conditions. Based on the model projections through year 2070, and not considering the extreme low lake level of 572.44 predicted by Lofgren, the following table provides a reasonable planning range for monthly average lake level over the 50-year planning period.

Table 4 - Recommended Planning Range for Lake Levels

	HIGH	LOW
Planning Range for Monthly Average Lake Level Through Year 2070, IGLD 85	582	576

A summary of projected and planning water levels presented here are summarized together in Figure 1.

Effect of Isostatic Rebound and Adjustment to International Great Lakes Datum

The International Great Lakes Datum (IGLD) is planned for an update in the coming years. The need for the update is in part due to the long-term phenomena of a rebounding earth crust in the Great Lakes basin following retreat of the glaciers at the end of the last ice age. The process, referred to as glacial isostatic adjustment (GIA), is a slow process that has the overall effect of tilting the basin southward. Therefore, long term changes in water levels due to GIA will favor

higher water levels in the southern portion of the lakes and lower lake levels in the northern areas (Great Lakes Water Levels Integrated Assessment Report [2018]). For Port Milwaukee, which is located within the southern zone of the Great Lakes, the estimated rate of lowering earth is about 5.5 inches per century. The result of GIA for Port Milwaukee will likely trend toward higher lake levels. However, average lake levels may be offset by the predicted lowering of water due to factors identified in this planning document. The overall net effect of raising and lowering factors over the next 50-100 years may be negligible. For the next 50-year planning period, Port may consider a negligible impact and therefore limited asset planning as it relates to GIA and adjustment of IGLD.

3.2 Precipitation

Current global climate models have difficulty estimating future changes in precipitation patterns and rainfall intensity. However, climate change, resulting in increased air temperatures, will likely increase the frequency and intensity of severe storms. Annual average precipitation will likely increase or remain nearly stable, as the warmer temperatures will lead to less precipitation falling as snow, and more falling as rain. This will increase the intensity of precipitation during rainfall events, even if total averaged annual rainfall remains stable (Great Lakes Coastal Resilience Planning Guide, 2013).

3.3 Storm Surge

High surge events that raise the water level at Port Milwaukee are caused by strong storms with high winds and atmospheric pressure variations. Strong storm conditions typically occur in late spring and winter, with surge levels usually around 1.5 to 2 feet (Melby, 2012). A figure excerpt from Melby below shows the calculated probability of storm surge height (ft) for Milwaukee. A storm surge with a 2% probability (50-year return period) is around 2 feet.

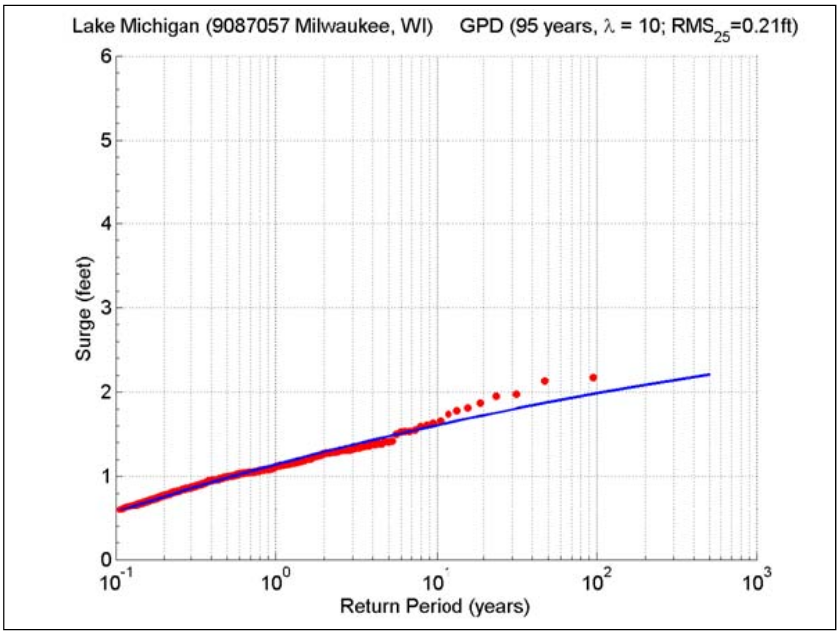

Figure 67. Milwaukee surge PDS empirical distribution and best fit using GPD.

There appears to be little correlation between surge height and lake levels. For coastal planning purposes, Port Milwaukee should consider storm surges around 2 feet in height will be experienced over the planning period.

3.4 Wave Heights and Runup

For assets on the outer harbor, wave breaking, wave setup, wave runup and wave overtopping are also considerations in total water level. Below is a summary of the ten most significant storm events and their resulting wave conditions for a beach profile near Milwaukee (Melby, 2012).

Table 5 - Wave Runup Data Example (Melby, 2012)

Table 24. Wave runup results for top 10 storms for beach profile near Milwaukee gage.

Year	Month	Surge (ft)	Offshore H_{m0} (ft)	Nearshore H_{m0} (ft)	CSHORE $R_{2\%}$ (ft)	Total Water Level (ft, IGLD85)
1987	3	2.13	14.11	9.25	5.81	588.2
1987	12	1.95	16.40	9.62	6.09	587.6
1990	12	1.78	14.11	9.24	6.04	586.5
1985	3	1.61	10.83	7.27	4.11	586.9
1971	12	1.52	9.19	6.95	3.58	585.5
1974	2	1.24	19.03	9.48	6.80	585.5
1984	2	1.03	19.03	9.62	6.31	585.1
1973	12	0.96	16.73	9.11	5.79	585.3
1987	12	1.95	16.40	9.62	6.09	587.6
1993	4	1.36	16.40	9.62	6.33	586.6

The calculated wave runup results shown in Table 5 is for a beach profile transect into Milwaukee Harbor. The model results do not account for the presence of the federal breakwater but are still informative. The actual wave runup will be less than the modeled result due to the dampening effect of the breakwater. The runup elevation accounts for a beach or shallow slope profile at the shoreline, in this case 1:33. Most of Port Milwaukee's waterfront exposed to offshore waves is constructed of vertical face dockwalls. Runup and wave interaction with these structures will differ. Specifically, dockwalls such as those on South Piers 1 and 2, with relatively deep water depths in front of them may experience wave heights similar to those represented in the fifth column of Table 5 (Nearshore, Hmo (ft)), not accounting for effects of the breakwater. As can be seen in the table, wave heights on the order of 6 to 9.5 ft at the dockwalls may have been experienced during these modeled storm events.

For this evaluation, it is a reasonable assumption that a maximum 9-foot wave could potentially interact with the piers. The specifics of how a 9-foot wave interacts with the piers in these cases will depend on the wave angle and orientation of the dockwall. Waves tend to be almost fully reflected by vertical dockwall structures. However, when large non-breaking waves encounter a dockwall, they may be in some instances reflected up along the dockwall allowing for water to overtop the structure. The general dock elevations for South Pier 1 & 2 are 589 to 590 so it would be expected for these 9-foot wave scenarios to overtop the piers during high lake level conditions (582 + 9 = 591). Any additional lake level due to storm surge would certainly

exacerbate the amount of wave overtopping. Of course, as stated prior, it is expected that the federal breakwater provides some level of reduction to the wave heights experienced at the piers to those indicated in Table 5. Historical observations indicate that conditions do arise where the dockwalls along the east side of the Port's south harbor tract are overtopped by storm-driven wave events during high lake level conditions. For Port asset planning purposes, it is recommended that Port consider wave heights of at least 590 will be experienced on its eastern dockwalls and runup and overtopping of dockwalls will occur during major storm events.

4. VULNERABLE ASSETS

Port Milwaukee waterfront assets are susceptible to damage, wear, and being rendered inoperable or reduced in function by effects of coastal processes. A summary of vulnerable assets and specific negative impacts from coastal processes is provided in Table 6.

Table 6 - Asset Vulnerabilities

Asset	Coastal Process	Vulnerabilities
Buildings		
Terminal #2 Building	Wave Runup and Overtopping Dockwall	Damage to south face overhead doors due to wave forces.
Terminal #3 Building	Wave Runup and Overtopping Dockwall	Damage to north face overhead doors due to wave forces particularly at northwest corner of building where geometry of Slip 2 focuses wave energy. During winter condition, ice buildup inhibits use of apron alongside building in northwest corner.
Terminal #4 Building	Wave Runup and Overtopping Dockwall	Damage to south face overhead doors due to wave forces.
Dockwalls		
South Pier 1 & Terminal 1 Dockwalls	Low Water Levels	South Pier 1 dockwalls and Terminal 1 Dockwall were constructed in 1930s and designed for -25 ft dredge depth. An additional 5 ft depth (-30 ft) was dredged in 1950s to accommodate Seaway max depth. Low water levels may require dredging to maintain navigational depth. Wall stability is a factor to consider if additional dredge depths are required.
Navigational Areas (Dredging)		
Slip 1	Low Water Levels	Dredging to maintain navigational depth. (~8,500 CY per foot of dredging)
Slip 2	Low Water Levels	Dredging to maintain navigational depth. (~10,500 CY per foot of dredging)

Asset	Coastal Process	Vulnerabilities
Slip 3	Low Water Levels	Dredging to maintain navigational depth. (~11,900 CY per foot of dredging)
Liquid Cargo Pier (North & South Slips)	Low Water Levels	Dredging to maintain navigational depth. Pier has slips on both sides. Vulnerability may be limited to dredging north side only to maintain use. (~24,600 CY per foot of dredging)
City Heavy Lift Dock (CHLD)	Low Water Levels	Dredging to maintain navigational depth. (~3,400 CY per foot of dredging)
Municipal Mooring Basin	Low Water Levels	Low water levels may require dredging to maintain navigational depth More extreme precipitation/storm events may cause more upland erosion, leading to increased sedimentation
Fencing		
Fenceline and Gates, East Side of Lincoln Memorial Drive	Wave Runup and Overtopping Dockwall	Damage to fence and gates due to wave overtopping of dockwalls and inland flooding.
Green Infrastructure & Public Spaces		
Gravel Apron / Public Space Adjacent to Dockwall Between Confined Disposal Facility (CDF) and Slip 3.	Wave Runup and Overtopping Dockwall	Erosion of gravel surface and loss of public use from wave overtopping
Pavement and Roads		
South Pier 1 – East Asphalt Pavement	Wave Runup and Overtopping Dockwall	Damage and excessive wear of asphalt pavements from wave overtopping and erosion.
South Pier 2 – East Asphalt Pavement	Wave Runup and Overtopping Dockwall	Damage and excessive wear of asphalt pavements from wave overtopping and erosion.
Slip 1 - Asphalt Apron West of Slip 1	Wave Runup and Overtopping Dockwall	Damage and excessive wear of asphalt pavements from wave overtopping and erosion.
Slip 2 - Asphalt Apron West of Slip 2	Wave Runup and Overtopping Dockwall	Damage and excessive wear of asphalt pavements from wave overtopping and erosion.
Slip 3 - Asphalt Apron West of Slip 3	Wave Runup and Overtopping Dockwall	Damage and excessive wear of asphalt pavements from wave overtopping and erosion.
City Heavy Lift Dock Asphalt Apron	High Lake Levels	Flooding in low areas of CHLD.

Asset	Coastal Process	Vulnerabilities
Rail		
Piers 1 and 2	Wave Runup and Overtopping Dockwall	Ice cover from wave overtopping may damage rails
Utilities		
Storm Sewers	High Lake Levels and Storm Surge	Flooding of upland low areas through storm sewer inlets during high lake level and storm surge conditions.

5. MITIGATION AND RENEWAL STRATEGIES

Mitigation and renewal strategies to address vulnerabilities of assets described in Section 4 are presented below and shown on Figure 2. These strategies are presented at a high level as alternatives and are intended to provide guidance for planning major repairs and renewals for port assets with vulnerabilities to coastal processes. These strategies should be regularly reviewed and updated with new data as it becomes available.

5.1 Wave Runup and Overtopping

Terminal Buildings (#2, #3, #4)

Terminals buildings #2, #3, and #4 are positioned relatively close to the dockwall which leaves the buildings susceptible to wave runup and overtopping conditions. Each building has a concrete foundation wall extending above grade that serves to protect the structure from damage caused by wave action on the piers. However, overhead door assemblies, particularly those toward the western end of the piers, are susceptible to damage from overtopping wave action. Some overhead door openings on the west end of Terminal building #2 have been barricaded with timbers for wave protection.

Mitigation alternatives include the following:

- Raise dockwall cap height during rehabilitation or replacement.
- Install flood resilient door systems.
- Change building use plan to permanently remove western overhead doors on the dockside of the terminal and close openings. Construct concrete wall across opening, ~3 feet high to provide continuation of flood protection.

Some protection of the western most doors may be provided by installation of wave protection structure such as wave-return wall, barrier, or wave energy dissipation (i.e. stone structure). Such structure would be limited to the western end of the pier where they would not interfere with the normal dockside use and operations.

Asphalt Pavements

Several locations associated with South Piers 1 & 2 and Slips 1, 2, & 3 have asphalt pavement installed directly adjacent to the dockwall where it is susceptible to wave overtopping and damage. The reinforced concrete aprons running alongside the piers provide a reasonable level of

protection from the erosive and damaging forces of wave overtopping and freeze/thaw cycling as compared to the asphalt pavement aprons found adjacent to the Ports dockwalls. Particularly since the concrete aprons are integrally tied into the sheet pile cap which provides a solid interface between dockwall and apron that protects against the erosive forces of overtopping wave action. Further, asphalt aprons behind the dockwall are in locations that are most susceptible to wave runup and overtopping due to their orientation to the primary wind-wave direction (east) associated with high wave conditions. Specifically, this refers to the aprons at the east end of South Piers 1 & 2 and west end of Slips 1, 2, & 3.

Mitigation alternatives include the following:

- Construct reinforced concrete apron integrated into pile cap.
- Raise dockwall cap height.
- Construct wave protection structures such as wave-return wall, barrier wall, or wave energy dissipation structure (i.e. large stone mound system).

Gravel and Public Spaces Areas

The Port's dockwall segments between the Confined Disposal Facility and South Pier 2 have a gravel apron behind them that is vulnerable to erosion from waves overtopping the dockwall. A portion of these dockwall segments are also available to public use and therefore are also susceptible to loss of use by the public resulting from wave damage. A section of the dockwall between the CDF and Liquid Cargo Pier will receive additional protection from planned expansion of the CDF. Any planned mitigations in this area should account for this planned future work.

Mitigation alternatives include the following:

- Construct wave protection in front of the dockwall such as a stone rubble mound. These sections of dockwall are not used operationally and therefore may be able to accommodate such protection without interfering in Port use.
- Raise dockwall height.
- Install resilient ground cover behind the dockwall such as apron of riprap stone. Material may need to be underlain with geosynthetic fabric or other separation material. Size should be large enough to resist erosion from overtopping waves while still providing a functional surface for maintenance vehicle and public fishing access.

5.2 Flooding

Fencing (East Side of Lincoln Memorial Drive)

The Port has a long line of security fencing running on the east side of Lincoln Memorial Drive that is susceptible to damage from coastal flooding under extreme events. The fenceline is primarily galvanized chain link fence. Some segments of the fenceline are required for security of Port operations. Other sections of the fence toward its southern end may potentially be eliminated with adjustment to operations.

Mitigation alternatives include the following:

- Construct flood resilient fencing during replacement.
- Eliminate fence in areas where not operationally required.
- Frequency of occurrence and relative damage repair costs are low. Consider maintaining fence as-is and replace when damaged.

Storm Sewers

During high lake level conditions combined with storm surge events, storm sewer outfalls into Lake Michigan with low inland catchment areas can become flooded from backflow through the system. A few locations have been identified during the high-water conditions of 2019/2020 where this problem exists.

Mitigation alternatives for these conditions include:

- Installation of flood protection devices on storm sewer outfalls such as elastomeric duckbill assemblies or flap gates.

Two outfalls that could be targeted initially include the storm sewer outfall serving the Milwaukee Bulk Terminals lot and an outfall serving the City Heavy Lift Dock. Both outfalls are identified on Figure 2.

5.3 Low Water Conditions

Low water conditions exacerbate the need for dredging. The projected low water level used for planning (576) may require additional dredging to maintain Seaway max depths. This amounts to an additional 1 to 1.5 feet of dredge depth which should be readily accommodated by the South Pier 2 dockwalls and those at the CHLD and Municipal Mooring Basin. The dockwall associated with Terminal 1 and South Pier 1 are already dredged lower than their design height and therefore will require additional analysis before deepening to determine what, if any, bracing our reinforcement to the wall may be required to ensure stability. When replacing the wall, design should account for lower planned water levels.

5.4 Increased Precipitation Intensity/Frequency

Under any lake water level conditions, climate change is likely to cause more intense rain precipitation events. For these conditions, the following asset renewal strategies should be considered:

- Storm sewer capacity should be evaluated and potentially increased
- Sedimentation of upstream eroded material should be monitored and dredging frequency potentially increased.

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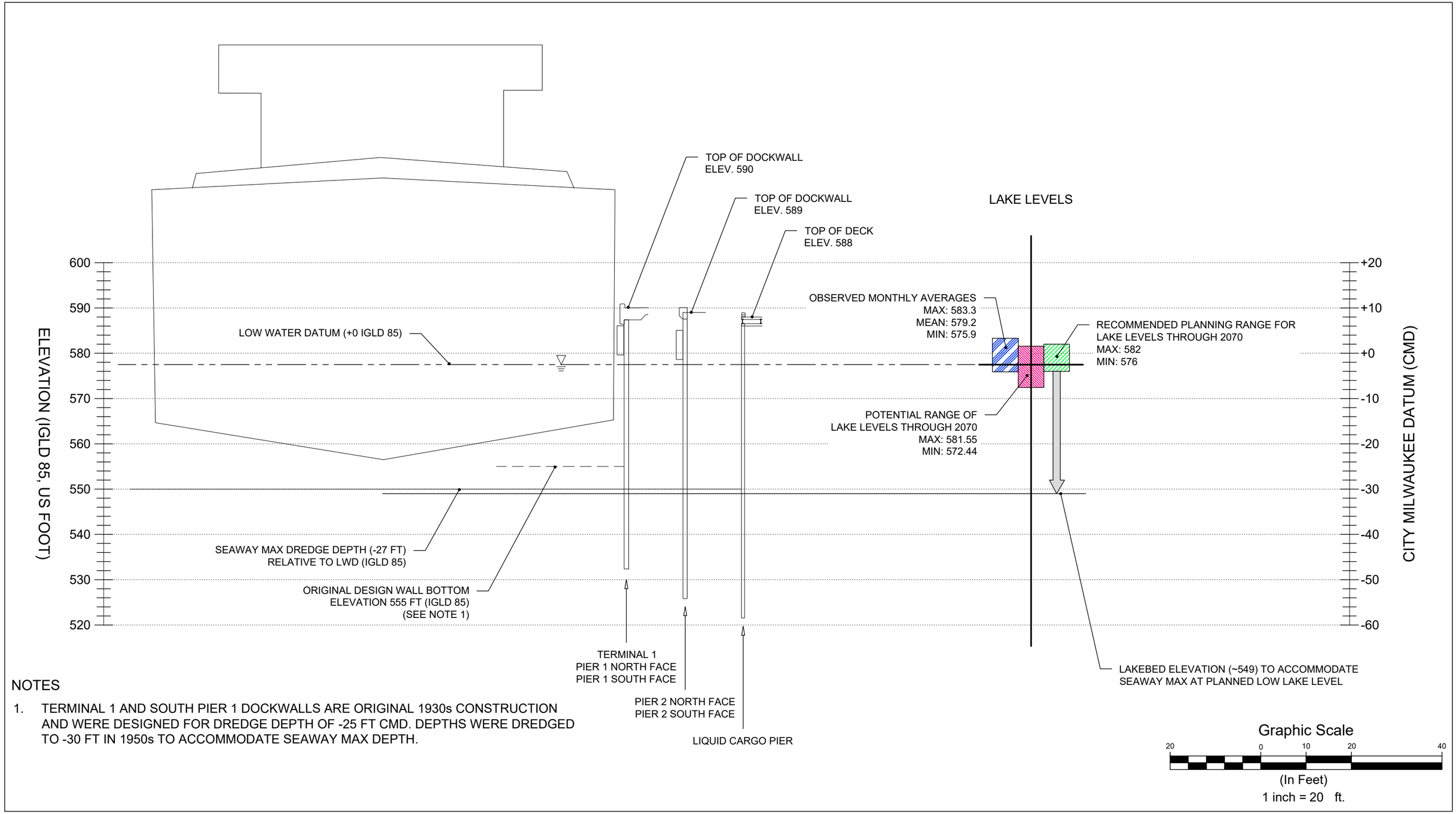

NOTES

1. TERMINAL 1 AND SOUTH PIER 1 DOCKWALLS ARE ORIGINAL 1930s CONSTRUCTION AND WERE DESIGNED FOR DREDGE DEPTH OF -25 FT CMD. DEPTHS WERE DREDGED TO -30 FT IN 1950s TO ACCOMMODATE SEAWAY MAX DEPTH.

Graphic Scale

20 0 10 20 40

(In Feet)

1 inch = 20 ft.

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WATER LEVELS
COASTAL MANAGEMENT FRAMEWORK

PORT MILWAUKEE

FIGURE 1

RAMBOLL US CONSULTING
A RAMBOLL COMPANY
234 W. Florida St. Milwaukee, Wisconsin

RAMBOLL

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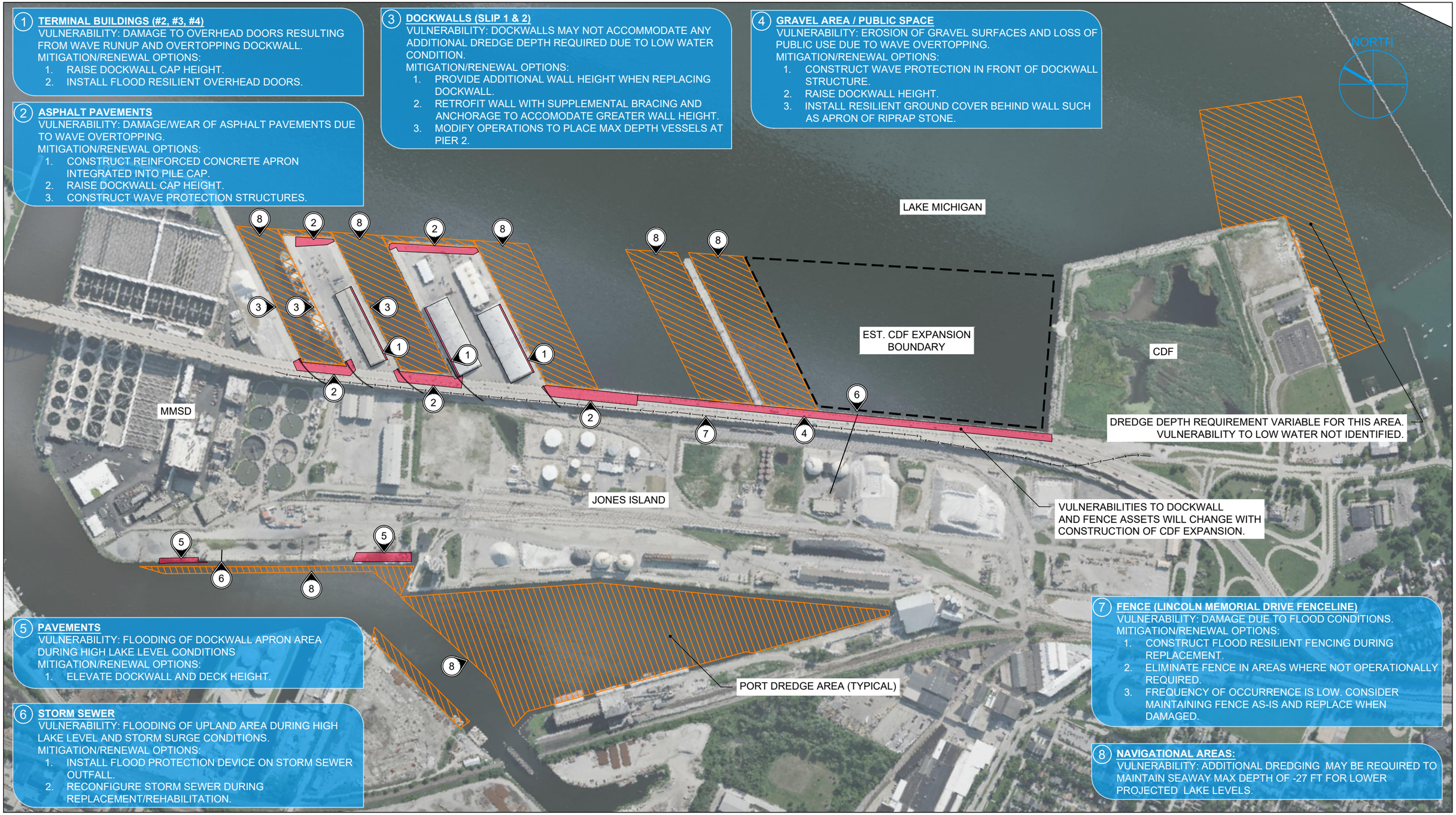

1 TERMINAL BUILDINGS (#2, #3, #4)
VULNERABILITY: DAMAGE TO OVERHEAD DOORS RESULTING FROM WAVE RUNUP AND OVERTOPPING DOCKWALL.
MITIGATION/RENEWAL OPTIONS:
1. RAISE DOCKWALL CAP HEIGHT.
2. INSTALL FLOOD RESILIENT OVERHEAD DOORS.

2 ASPHALT PAVEMENTS
VULNERABILITY: DAMAGE/WEAR OF ASPHALT PAVEMENTS DUE TO WAVE OVERTOPPING.
MITIGATION/RENEWAL OPTIONS:
1. CONSTRUCT REINFORCED CONCRETE APRON INTEGRATED INTO PILE CAP.
2. RAISE DOCKWALL CAP HEIGHT.
3. CONSTRUCT WAVE PROTECTION STRUCTURES.

3 DOCKWALLS (SLIP 1 & 2)
VULNERABILITY: DOCKWALLS MAY NOT ACCOMMODATE ANY ADDITIONAL DREDGE DEPTH REQUIRED DUE TO LOW WATER CONDITION.
MITIGATION/RENEWAL OPTIONS:
1. PROVIDE ADDITIONAL WALL HEIGHT WHEN REPLACING DOCKWALL.
2. RETROFIT WALL WITH SUPPLEMENTAL BRACING AND ANCHORAGE TO ACCOMODATE GREATER WALL HEIGHT.
3. MODIFY OPERATIONS TO PLACE MAX DEPTH VESSELS AT PIER 2.

4 GRAVEL AREA / PUBLIC SPACE
VULNERABILITY: EROSION OF GRAVEL SURFACES AND LOSS OF PUBLIC USE DUE TO WAVE OVERTOPPING.
MITIGATION/RENEWAL OPTIONS:
1. CONSTRUCT WAVE PROTECTION IN FRONT OF DOCKWALL STRUCTURE.
2. RAISE DOCKWALL HEIGHT.
3. INSTALL RESILIENT GROUND COVER BEHIND WALL SUCH AS APRON OF RIPRAP STONE.

5 PAVEMENTS
VULNERABILITY: FLOODING OF DOCKWALL APRON AREA DURING HIGH LAKE LEVEL CONDITIONS
MITIGATION/RENEWAL OPTIONS:
1. ELEVATE DOCKWALL AND DECK HEIGHT.

6 STORM SEWER
VULNERABILITY: FLOODING OF UPLAND AREA DURING HIGH LAKE LEVEL AND STORM SURGE CONDITIONS.
MITIGATION/RENEWAL OPTIONS:
1. INSTALL FLOOD PROTECTION DEVICE ON STORM SEWER OUTFALL.
2. RECONFIGURE STORM SEWER DURING REPLACEMENT/REHABILITATION.

7 FENCE (LINCOLN MEMORIAL DRIVE FENCELINE)
VULNERABILITY: DAMAGE DUE TO FLOOD CONDITIONS.
MITIGATION/RENEWAL OPTIONS:
1. CONSTRUCT FLOOD RESILIENT FENCING DURING REPLACEMENT.
2. ELIMINATE FENCE IN AREAS WHERE NOT OPERATIONALLY REQUIRED.
3. FREQUENCY OF OCCURRENCE IS LOW. CONSIDER MAINTAINING FENCE AS-IS AND REPLACE WHEN DAMAGED.

8 NAVIGATIONAL AREAS:
VULNERABILITY: ADDITIONAL DREDGING MAY BE REQUIRED TO MAINTAIN SEAWAY MAX DEPTH OF -27 FT FOR LOWER PROJECTED LAKE LEVELS.

Graphic Scale
600 0 300 600 1,200
(In Feet)
1 inch = 600 ft.

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VULNERABILITIES & MITIGATIONS
COASTAL MANAGEMENT FRAMEWORK

PORT MILWAUKEE

FIGURE 2

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RAMBOLL

APPENDIX B
STAKEHOLDER ENGAGEMENT SUMMARY

PORT MILWAUKEE

CAPITAL ASSET RENEWAL PLAN

Stakeholder Meeting Presentations

February 18, 2021 @ 1:00 PM – 3:30 PM CST

February 19, 2021 @ 9:30 AM – 12:00 PM, CST

Primary Project Team

Port Milwaukee

- → Adam Tindall-Schlicht, Director
- → Brian Kasprzyk, Harbor Engineer
- → Maria Cartier, Market Development Manager
- → Eric Polzin, Port Facilities Supervisor
- → Steve Paczesny, Field Engineer

Ramboll

- → Craig Harley, Project Manager
- → Laurie Parsons, Senior Vice President
- → Jessica Geurts, Project Engineer

And many others…including important project funding partners at Wisconsin Coastal Management Program

WISCONSIN COASTAL MANAGEMENT PROGRAM

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PUBLIC FEEDBACK PROCESS AND EXPECTATIONS

- Please keep cameras turned off and microphones muted.
- Questions may be submitted anytime using the Chat feature.
- After an overview of the project is presented, comments received will be addressed.
    - Persons submitting questions may be called upon to verbally expound upon written question – in this case use of camera and microphone is encouraged!
- The meeting will then move into an overview of each of the Port's 10 asset categories. Specific feedback will be sought and comments addressed after each category is presented.
- Should meeting time allow and all Chat feedback be addressed, attendees may then be asked to use the Raise Hand feature by the moderator, signifying interest in providing additional feedback.

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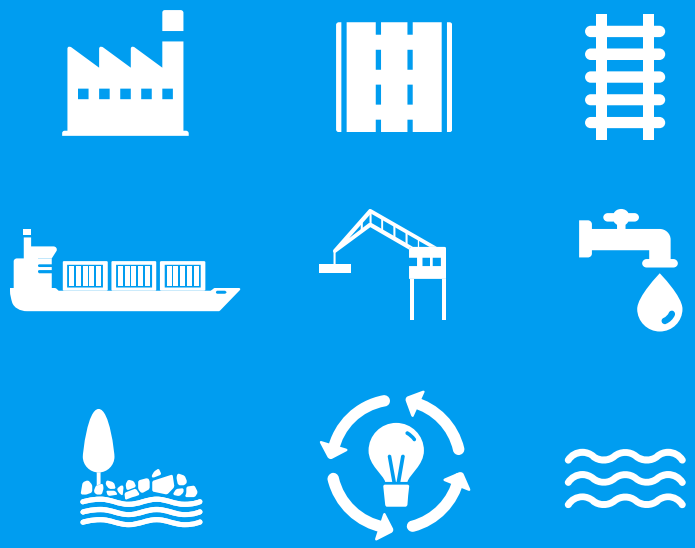
AGENDA

1. DIVERSITY AND INCLUSION MOMENT
2. OVERVIEW OF PORT MILWAUKEE CAPITAL ASSET RENEWAL PLAN PROJECT
   - PURPOSE & CONTEXT
   - PROJECT SCHEDULE
   - PLAN REQUIREMENTS
   - PLAN DEVELOPMENT METHODOLOGY AND APPROACH
3. OVERVIEW OF ASSET INVENTORIES
4. DEFINING LEVEL OF SERVICE
5. HIGH-LEVEL ASSET RENEWAL STRATEGIES
6. PAUSE FOR STAKEHOLDER FEEDBACK
7. GENERAL REVIEW OF EACH ASSET CATEGORIES AND RENEWAL STRATEGIES – PAUSE FOR STAKEHOLDER FEEDBACK AFTER EACH



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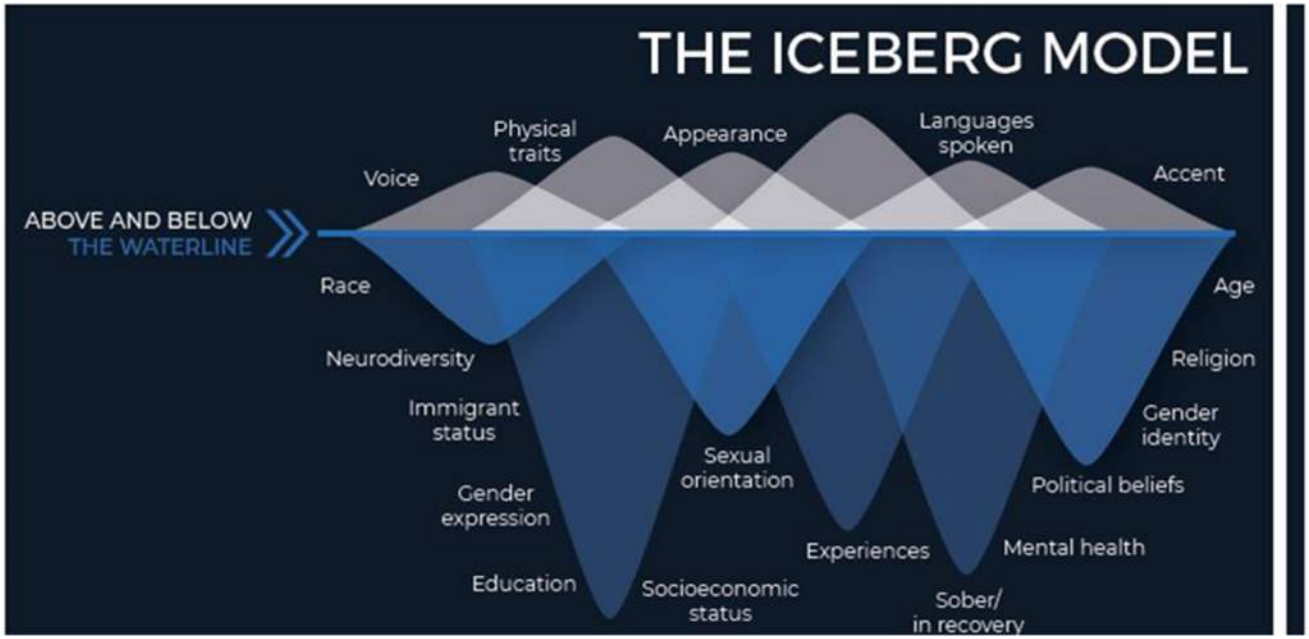
DIVERSITY & INCLUSION

- Diversity is more than what meets the eye
- Recognizing what's both above and below the waterline
- Creating the safety to share and understand what's below the waterline is **Inclusion**
- People bringing their unique experiences and backgrounds together sparks solutions that create a better and healthier community
- When every person feels valued, motivated and acts responsibly we are able to build an inclusive, diverse and prosperous environment.



Source: *Emerge Stronger: Architecting a More Inclusive & Equitable Future of Work, Jennifer Brown Consulting 2020*

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PURPOSE OF PLAN

- In 2020 Port Milwaukee began the process of establishing a Capital Asset Renewal Plan (CARP) to comprehensively address deficiencies in port facilities and infrastructure and establish a maintenance and replacement schedule.
- The CARP will serve as a tool for Port Milwaukee to:
  - strategically plan significant improvements to port facilities; and
  - develop funding strategies for long-term asset repair and replacement.
- The CARP provides a high level, long-term action plan for asset renewal through the year 2070 and includes considerations for several key factors influencing asset renewal planning at the port, including growth plans and long-term trends in coastal conditions and infrastructure resiliency.

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CONTEXT OF PLAN

- CARP will be managed/maintained by Port Milwaukee.
- Currently Port Milwaukee requires a comprehensive asset management system that encompasses all major asset categories.
    - Plan is being developed to stand alone but able to roll into future asset management system.
- Plan will align with the Port's Mission and Vision and other objectives related to asset management.
- Plan will consider input from Port and City leadership, key stakeholders including tenants, customers and community organizations.

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PROJECT SCHEDULE OVERVIEW

PROJECT KICK-OFF

Port Milwaukee Awards Project to Consultant (Ramboll)

NOVEMBER

STAKEHOLDER ENGAGEMENT

Port Tenants, Customers, Community Orgs, BHC, MCC

FEBRUARY - MARCH

2020 — 2021

DECEMBER - MARCH

FACILITY INSPECTION AND CONDITION ASSESSMENTS

Assess Asset Inventories, Data, and Condition.

Determine Renewal Requirements

MARCH – AUGUST

CARP DEVELOPMENT

First Draft by March 2021

Final Draft by August 2021

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PLAN REQUIREMENTS

- Align with Port Mission and Vision
- Align with Asset Renewal Objectives:
  - *Position the Port for future growth.*
  - *Maintain assets in a state of good repair.*
- Develop plan to support future incorporation into comprehensive asset management system

Port Milwaukee Mission

The mission of Port Milwaukee is to strengthen the overall economic and social environment of Milwaukee and the region by increasing international trade, business development, job creation and public access to the waterfront. The Port is a premiere provider of domestic and international transportation and freight distribution services for its commercial customers.

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OVERVIEW OF PLAN DEVELOPMENT METHODOLOGY AND APPROACH

Evaluate State of Port Infrastructure	Define Level of Service (LOS)	Identify Asset Renewal Strategies and Develop Plan
• Establish, organize, and assess asset inventory to be included in plan. • Determine current replacement value (CRV) of assets. • Assess condition of assets and estimate Useful Life (UL) and Remaining Useful Life (RUL). • Identify deferred maintenance and replacement needs and costs.	• Define LOS for each asset type • Standardize LOS for each asset category around 5-point scale based on RUL or specific condition rating *In basic terms, Level of Service is the Port's required level of quality and performance of its assets.*	• Define asset renewal strategies that consider several factors. • Develop renewal plan for maintenance and replacement work over the plan period (through year 2070).

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OVERVIEW OF ASSET INVENTORY

- Assets organized into 10 primary categories
- Facilities and structures included:
  - Assets within 10 primary categories and within Port Parcel Boundaries of North and South Harbor Tracts
- Facilities and structures excluded:
  - Roadways within the public right of way (ROW)
  - Utilities within ROW
  - Above ground assets at bare ground lease facilities

Port Asset Category	Inventory Status
Buildings	Complete
Dockwalls	Complete
Draft (Dredge Depths)	Complete
Fencing	Not Inventoried
Green Infrastructure & Public Spaces	Partially Complete
Lighting	Not Inventoried
Pavement and Roads	Complete
Rail	Complete
Utilities (Water, Sanitary, & Stormwater)	Complete
Vehicles, Vessels, Cranes, and Other Equipment	Partially Complete

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SOUTH HARBOR TRACT

Asset Categories Present (All):

- **Buildings**
- **Dockwalls**
- **Draft (Dredge Depths)**
- **Fencing**
- **Green Infrastructure & Public Spaces**
- **Lighting**
- **Pavement and Roads**
- **Rail**
- **Utilities (Water, Sanitary, & Stormwater)**
- **Vehicles, Vessels, Cranes, and Other Equipment**

BOUNDARY OF SOUTH HARBOR TRACT LAND AREA

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NORTH HARBOR TRACT

Asset Categories Present:

- **Dockwalls**
- **Draft (Dredge Depths)**
- **Green Infrastructure & Public Spaces**
- **Lighting**
- **Utilities**

BOUNDARY OF NORTH HARBOR TRACT LAND AREA

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LEVEL OF SERVICE

- Define Level of Service (LOS) for each asset type.
  - Organizational goals
  - Stakeholder expectations and considerations
  - Consider future level of demand and change in level of service.
- LOS Defined (based on ISO 55000):
  - Parameters, or combination of parameters, which reflect social, political, environmental, and economic outcomes that the organization delivers.
  - Parameters can include safety, customer satisfaction, quality, quantity, capacity, reliability, responsiveness, environmental acceptability, cost, and availability.

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ASSET RENEWAL STRATEGIES

- Factors considered in asset renewal planning
  - Port goals and objectives
  - Stakeholder input
  - Risk in assumed asset deterioration rate
  - New technology factors that may influence asset management plan
  - Future changes in regulations
  - Coastal resiliency
  - What else?
- Determine rehabilitation and replacement options
  - Prepare lifecycle cost through year 2070.
  - Use assumed annual inflation rate to estimate future cost of work based on 2021 cost

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END OF PROJECT OVERVIEW PRESENTATION
PAUSE TO ADDRESS COMMENTS RECEIVED

BUILDINGS, TERMINALS, AND WAREHOUSES

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NORTH
TERMINAL #3A BUILDING
TERMINAL #3 BUILDING
TERMINAL #4A BUILDING
TERMINAL #4 BUILDING
SEA SCOUTS BUILDINGS
LAKE EXPRESS BUILDING
EST. FUTURE CDF EXPANSION AREA
CDF
MILWAUKEE BULK TERMINAL WAREHOUSE
MMSD
COMPASS MINERAL OFFICE BUILDING
TERMINAL #5 BUILDING
BRADFORD #2 BUILDING
BRADFORD #1 BUILDING
SEAMAN'S CLUB BUILDING
PORT ADMIN BUILDING
POLE BUILDING #2
POLE BUILDING #1
PORTLAND TRUCKING BUILDING
SOUTH HARBOR TRACT BOUNDARY

PORT ADMINISTRATION BUILDING

- Primary Use:
  - Office space
  - Maintenance Garage
- Site Features:
  - Asphalt parking lot
  - Green Space
  - Public Walkway
  - Wind Turbine
- Planned Future Use:
  - Office Space/ Maintenance

PORT ADMINISTRATION BUILDING

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TERMINAL BUILDING #2

- Primary Use:
  - Warehouse / Office
- Site Features:
  - Concrete Dockside Apron
  - Rail Spur
  - Asphalt Pavement Yard
- Planned Future Use:
  - Warehouse / Office

TERMINAL BUILDING #2

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SOUTH PIER #2 TERMINAL BUILDINGS

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TERMINAL BUILDING #5

- Primary Use:
  - Warehouse
- Site Features:
  - Rail Spur
  - Asphalt Pavement Yard
- Planned Future Use:
  - Warehouse

TERMINAL BUILDING #5

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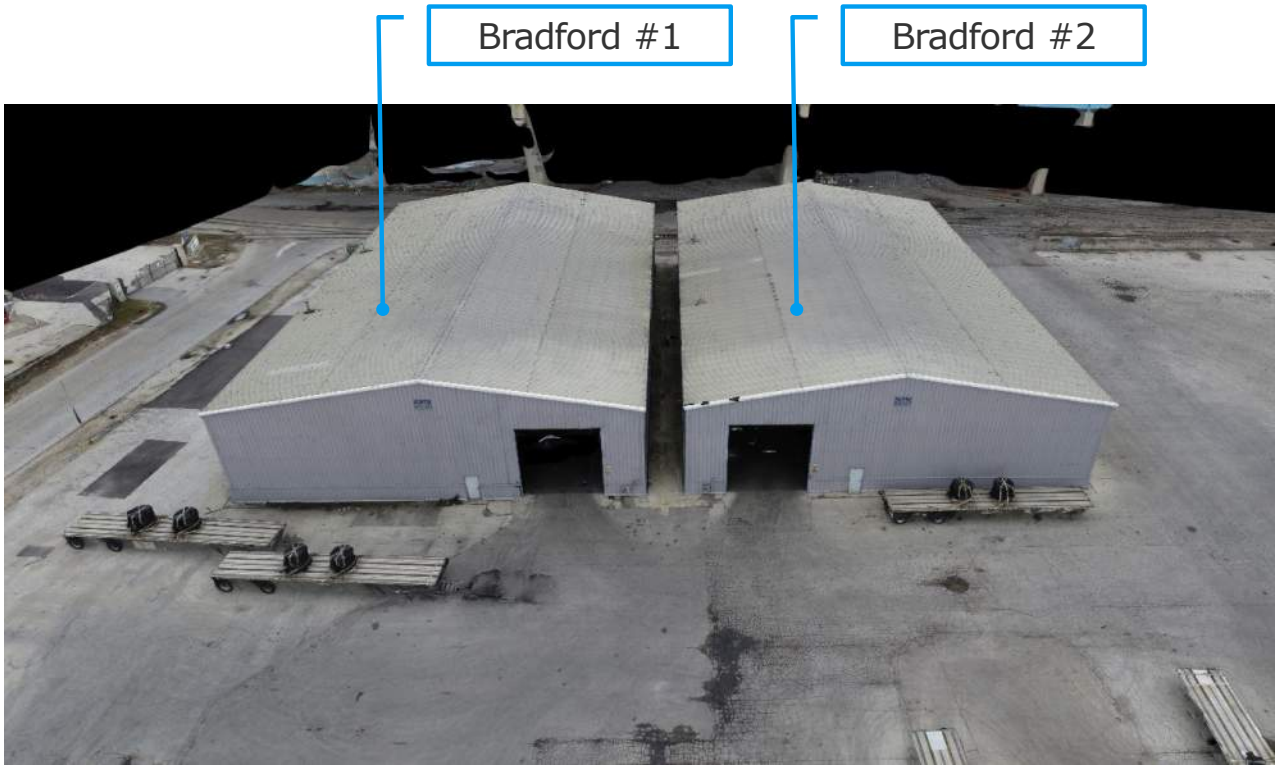
BRADFORD BUILDINGS

- Primary Use:
  - Warehouse
- Site Features:
  - Asphalt Pavement Yard
  - Climate controlled
- Planned Future Use:
  - Warehouse



BRADFORD BUILDINGS #1 & #2

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SEAMAN'S CLUB BUILDING

- Primary Use:
  - Office space
  - Currently Vacant
- Site Features:
  - Turf & Landscape Areas
  - Asphalt Parking Lot
- Planned Future Use:
  - Evaluating

SEAMAN'S CLUB

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MILWAUKEE BULK TERMINAL WAREHOUSE BUILDING

- Primary Use:
  - Office space
  - Warehouse
- Site Features:
  - Limited
- Planned Future Use:
  - Office space
  - Warehouse

MILWAUKEE BULK TERMINAL WAREHOUSE

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COMPASS MINERAL OFFICE BUILDING

- Primary Use:
  - Office space
- Site Features:
  - Limited
- Planned Future Use:
  - Office Space

COMPASS MINERAL OFFICE BUILDING

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PORTLAND TRUCKING BUILDING

- Primary Use:
  - Office space
  - Warehouse
- Site Features:
  - Limited
- Planned Future Use:
  - Office Space
  - Warehouse

COMPASS MINERAL OFFICE BUILDING

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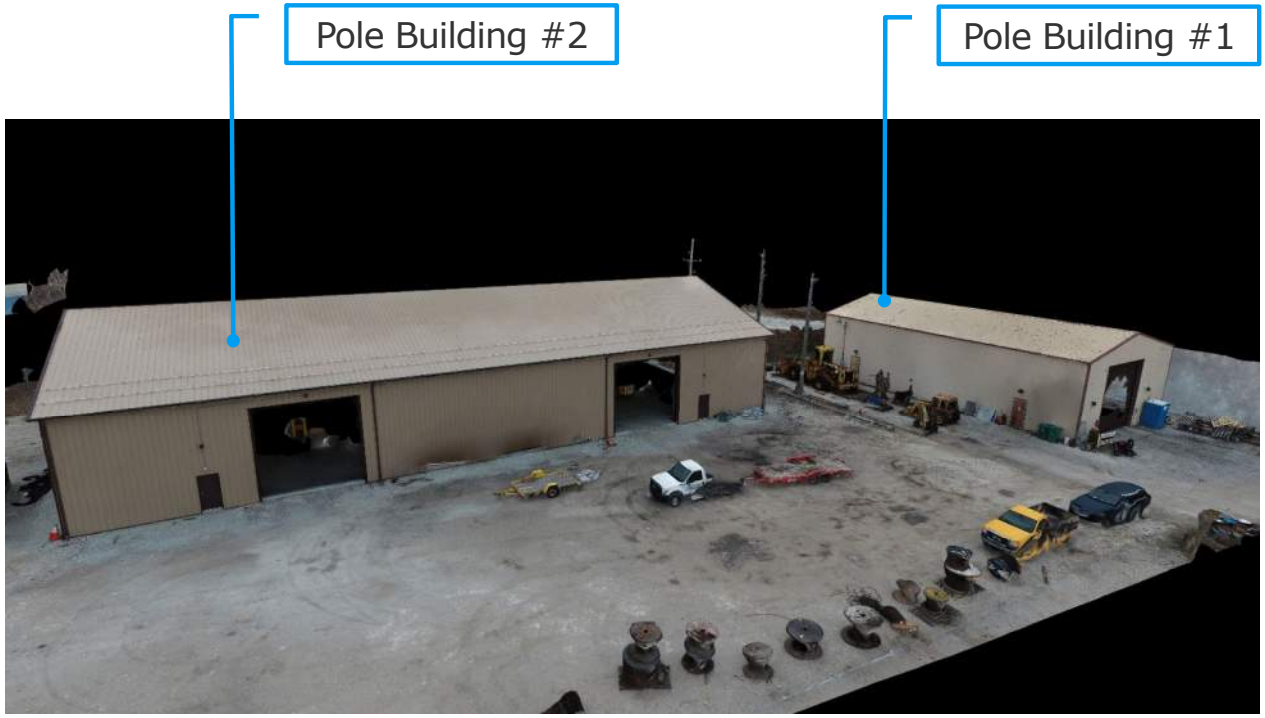
POLE BUILDINGS #1 AND #2

- Primary Use:
  - Warehouse / Maintenance Shop
- Site Features:
  - Asphalt yard
  - Gravel yard
- Planned Future Use:
  - Warehouse / Maintenance Shop



POLE BUILDINGS

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LAKE EXPRESS BUILDING

- Primary Use:
  - Car Ferry Terminal
- Site Features:
  - Asphalt Parking Lot
  - Hardscape Public Spaces
  - Dock & Apron
  - Turf & Landscape Areas
- Planned Future Use:
  - Car Ferry Terminal

LAKE EXPRESS BUILDING

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SEA SCOUTS BUILDINGS

- Primary Use:
  - Storage & Club Space
- Site Features:
  - Gravel drive and parking lot
  - Turf & Landscape Areas
  - Boat lift
- Planned Future Use:
  - Evaluating

SEA SCOUTS BUILDINGS

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RENEWAL PLAN FEEDBACK

Buildings

State of Infrastructure

Inventory: 17 Building structures ranging from warehouse to office buildings.

High value asset category

Level of Service

- Define LOS using building FCI
- Maintain FCI of 0.10 or below
- Maintain buildings to meet or exceed state building code requirements and other regulatory requirements.

Renewal Strategies

- Maintain or improve level of service
- Align replacements with growth plans
- Plan for new technologies (e.g. electric vehicle charge stations)
- Incorporate coastal resiliency factors associated with high lake levels and flood risks

Condition Rating	Excellent	Good	Fair	Poor	Deficient
Facility Condition Index (FCI)	<0.05	0.05-0.10	0.10-0.15	0.15-0.20	>0.20

$$Facility\ Condition\ Index = \frac{Renewal\ Costs}{Current\ Replacement\ Value}$$

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DOCKWALLS

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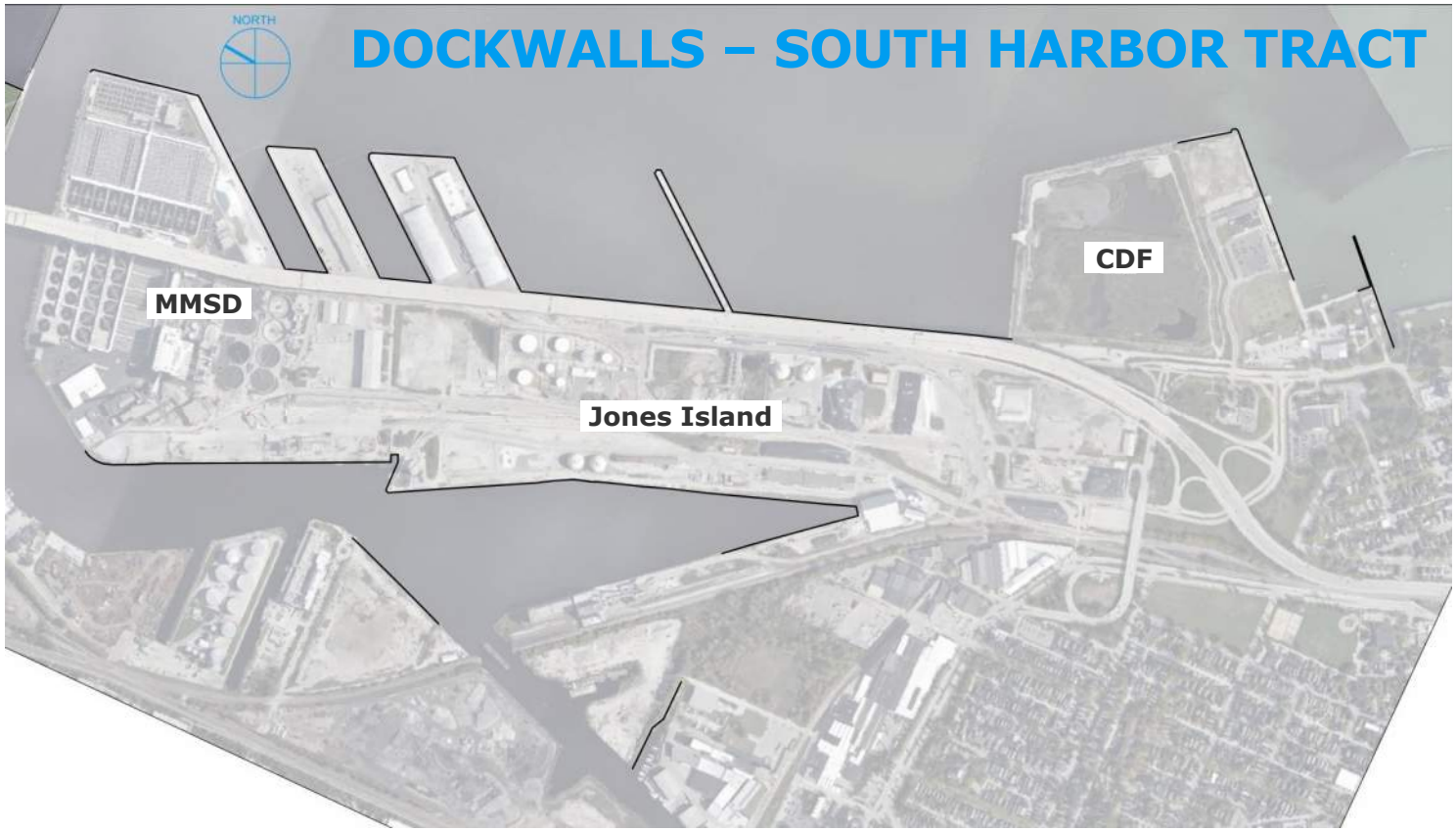

OVERVIEW MAP OF SHT DOCKWALL INVENTORY

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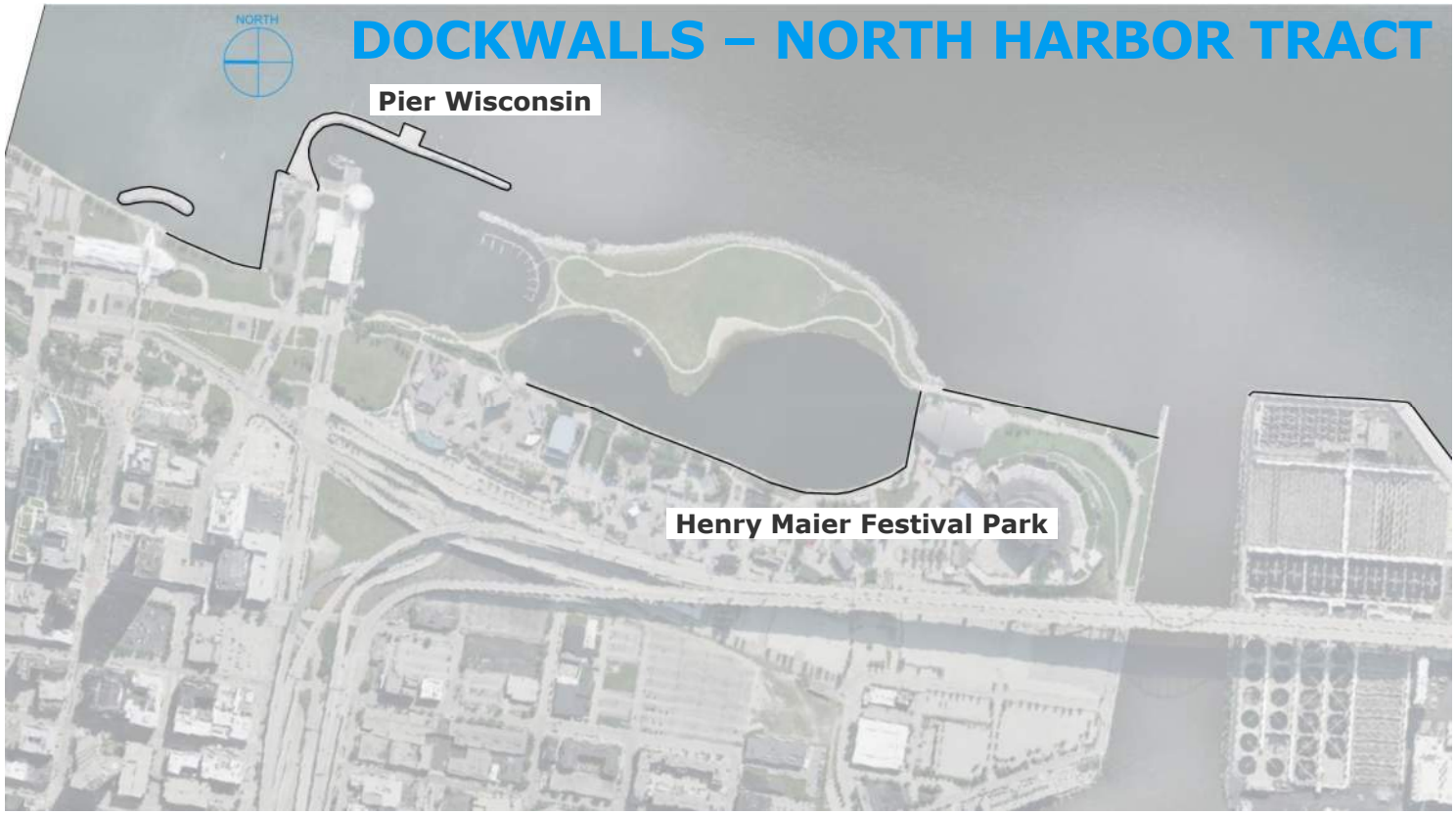

OVERVIEW MAP OF NHT DOCKWALL INVENTORY

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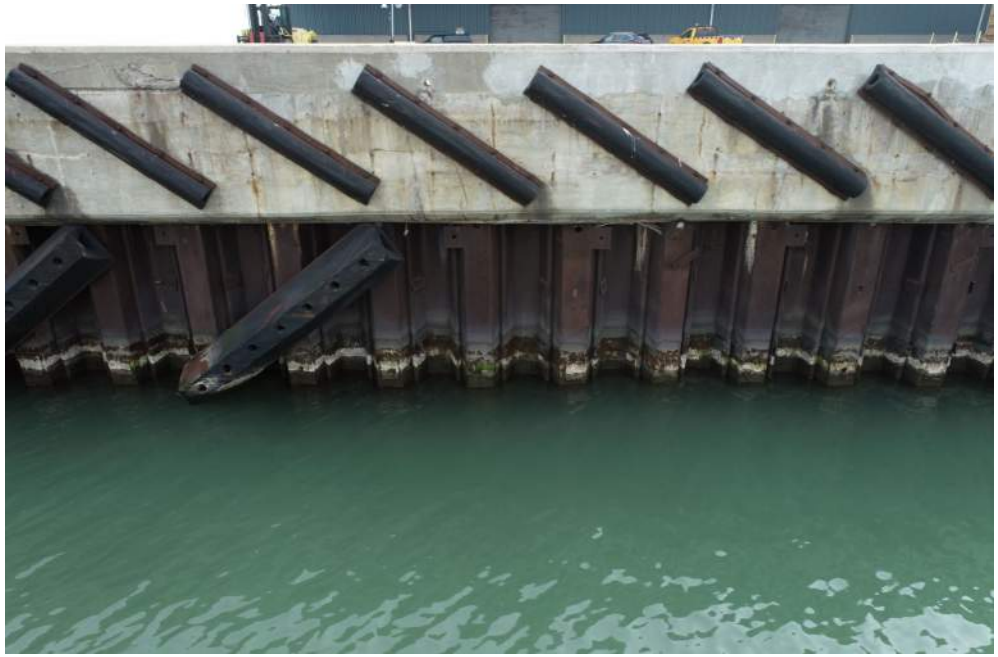
ANCHORED STEEL SHEET PILE WALL

DOCKWALL – BETWEEN FEDERAL PIER AND LAKESHORE STATE PARK



DOCKWALL – NORTH FACE OF SOUTH PIER 1

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CELLULAR STEEL SHEET PILE WALL

DOCKWALL – NORTH OF CITY HEAVY LIFT DOCK

DOCKWALL – LAKE EXPRESS

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DOCKWALL ASSET CATEGORY INVENTORY
STONE REVETMENT

QUIET WATER BASIN – NORTH HARBOR TRACT

RUBBLE MOUND - CDF

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PILE SUPPORTED DECK PIER (LIQUID CARGO PIER)

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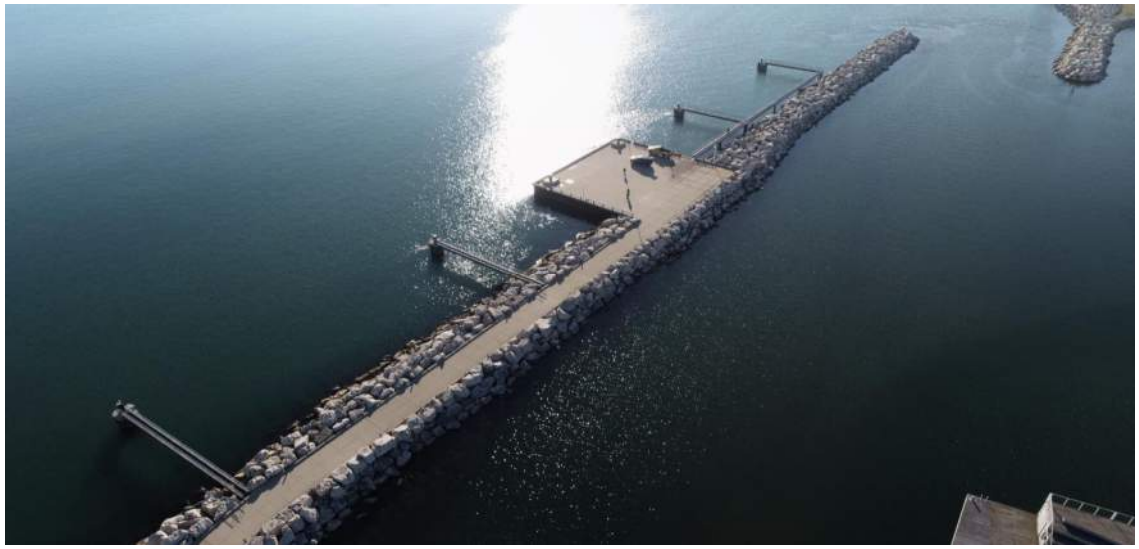
RUBBLE MOUND PIER WITH CONCRETE DECK (PIER WISCONSIN)



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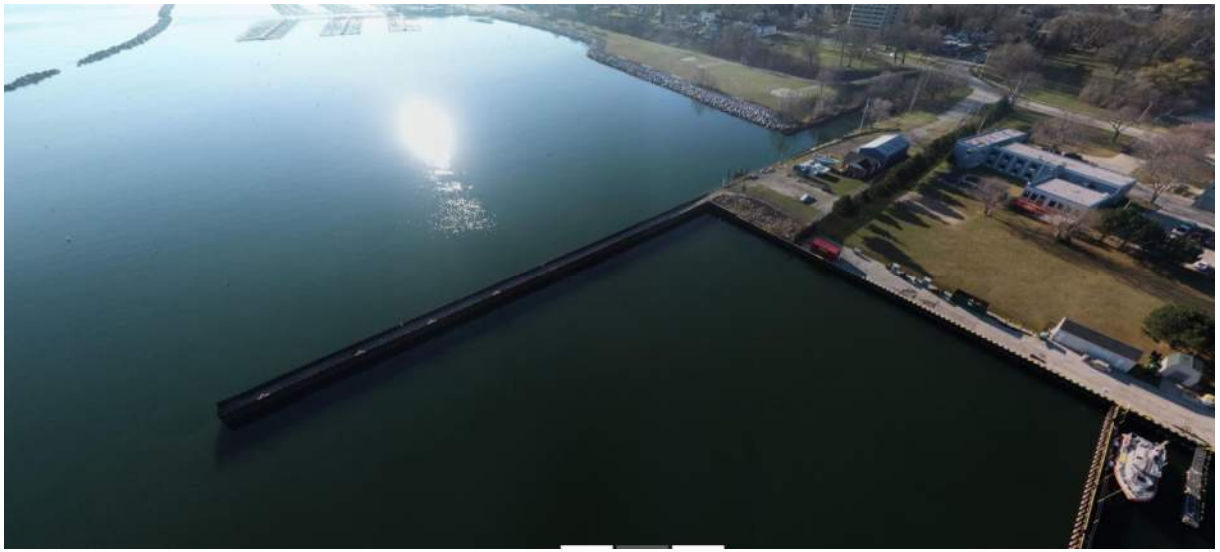
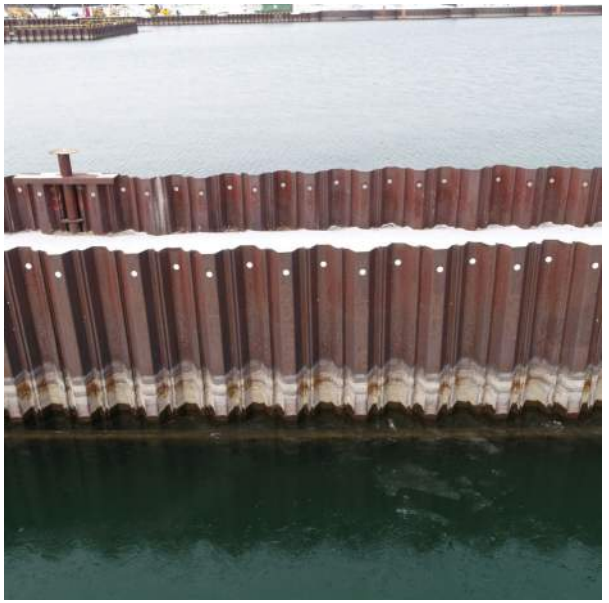
SSP PIER WITH ASPHALT/GRAVEL DECK (RUSSEL AVENUE PIER)





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RENEWAL PLAN FEEDBACK

Dockwalls

State of Infrastructure

Inventory: 33 Dockwall Segments

Types Include: Anchored SSP Wall, Cellular Wall Stone Revetment, Pile Supported Pier, Unimproved Shoreline

Condition:

- Overall Condition is Serviceable

High value asset category

Level of Service

- Maintain dockwalls in good condition.

Renewal Strategies

- Phased replacement
- Maintain level of service
- Replace in-kind, some areas to be improved
- Consider coastal resiliency factors associated with project lake levels.
- Operational changes to reduce accelerated deterioration.

Condition Rating	Excellent	Good	Fair	Poor	Deficient
% Remaining Useful Life (RUL)	>90	50-90	20-50	<10	Beyond Useful Life

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RAIL

RAMBOLL

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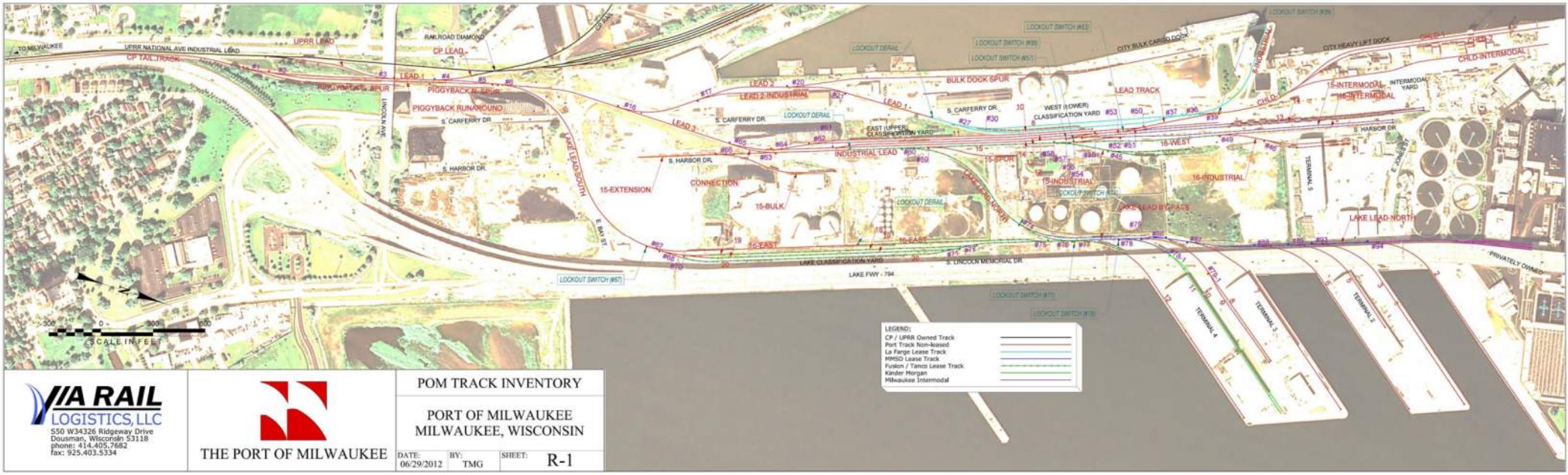
RAIL INVENTORY
SYSTEM OVERVIEW



2012 RAIL SYSTEM MAP

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RAIL INVENTORY

SWITCHES

CROSSINGS

TRACK

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RENEWAL PLAN FEEDBACK

Rail

State of Infrastructure

Inventory:

- Leased / Non-Leased Track Segments
- Switches
- Crossings
- Signals / Signage

Condition:

- Comprehensive condition assessment performed in 2020.
- Overall condition is serviceable

Level of Service

- Maintain in good condition
- Meet Railway Requirements/Regulations

Renewal Strategies

- Maintain or improve level of service
- Categorize track area/segments into priority areas based on condition and use.
- Consider coastal resiliency factors associated with risk to flooding.
- Upgrade rail to 115# standard and switches (Samson).
- Leverage state/fed funding with renewal planning approach.

Condition Rating	Excellent	Good	Fair	Poor	Deficient
% RUL	>90	50-90	20-50	<10	Beyond Useful Life

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PAVEMENTS AND ROADS

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OVERVIEW MAP OF SHT ROADWAY INVENTORY

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RENEWAL PLAN FEEDBACK

Pavements & Roads

State of Infrastructure

Inventory:

- Port Service Drives
- City Heavy Lift Dock
- Other Terminals and Piers

Condition:

- Under assessment

Level of Service

- Maintain in good condition

Renewal Strategies

- Consideration for heavier vehicle use and cranes when renewing.
- Consideration for stormwater drainage.
- Look to convert concrete aprons to durable asphalt surfaces as appropriate.
- Aligning/considering City PWD renewals for island roadways
- Align with other regional Port BMPs

Condition Rating	Excellent	Good	Fair	Poor	Deficient
PACER Rating	8-10	6-7	4-5	2-3	1

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UTILITIES

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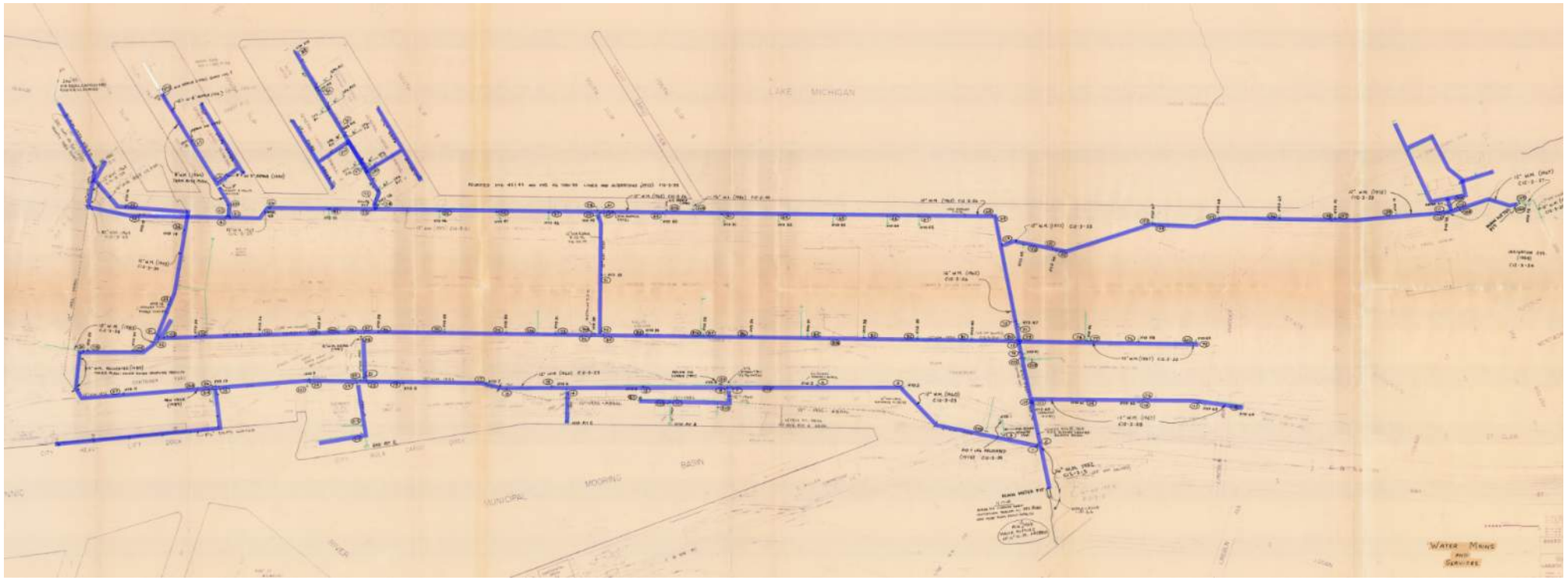
WATER DISTRIBUTION SYSTEM



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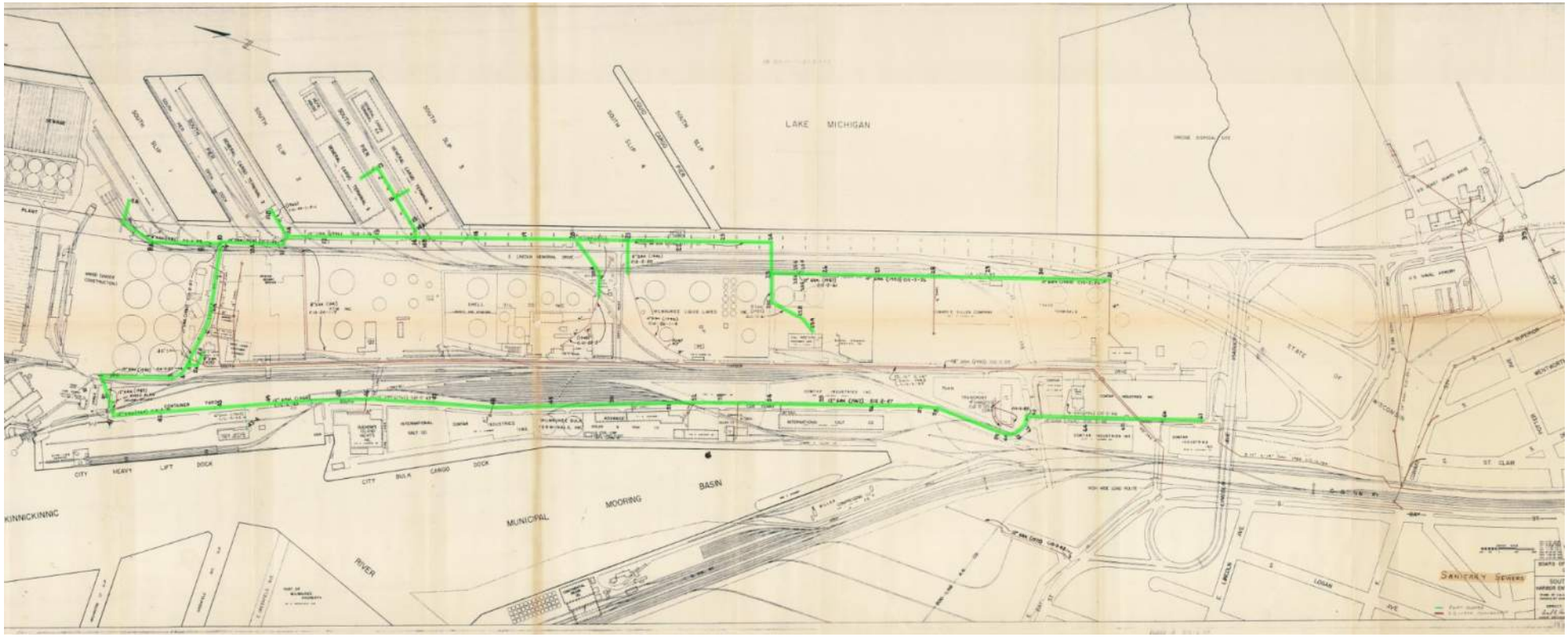
SANITARY SYSTEM



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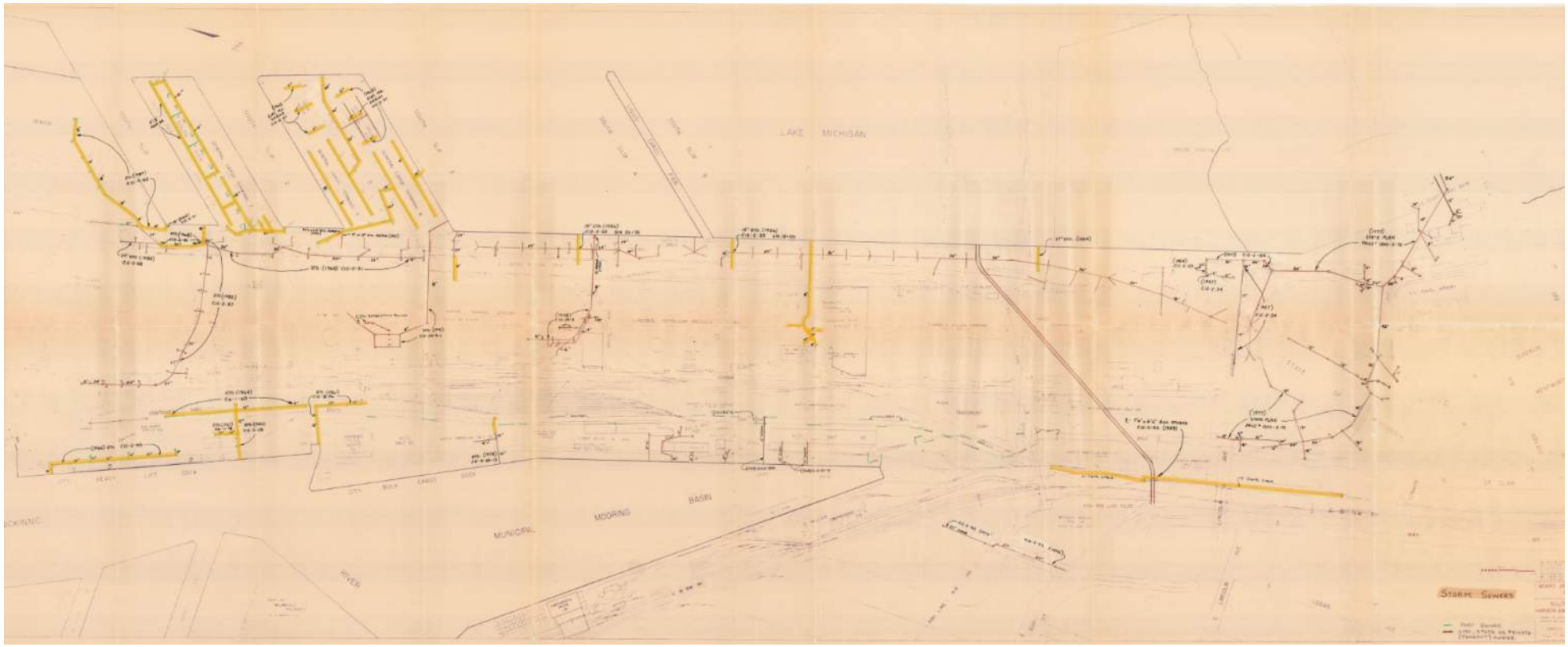
STORM SEWER SYSTEM



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RENEWAL PLAN FEEDBACK

Utilities

State of Infrastructure

Inventory:

- Asset Category Includes:
  - Water Distribution, approx. 3.7 miles
  - Sanitary Sewer, approx. 2 miles
  - Storm Sewer, approx. 1.5 miles

Condition:

- Water Dist. System avg. age 52 years
- Sanitary Sewer average age 54 years
- Storm Sewer average age 56 years

Level of Service

- Maintain utility systems in good condition
- Provide water and sewer systems as required by port and tenant operations

Renewal Strategies

- Maintain or improve current level of service
- Consider coastal resiliency factors associated with flooding risk relative to storm sewer infrastructure
- Phased replacement based on system age
- Operational changes to reduce accelerated deterioration
- Planned improvements to system capacity and operations based on future growth to shipping tonnage and cruise business

Condition Rating	Excellent	Good	Fair	Poor	Deficient
% Remaining Useful Life (RUL)	>90	50-90	20-50	<10	Beyond Useful Life

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DRAFT (DREDGE DEPTHS)
FENCING
GREEN INFRASTRUCTURE & PUBLIC SPACES
LIGHTING
VEHICLES, VESSELS, CRANES, AND OTHER EQUIPMENT

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RENEWAL PLAN FEEDBACK

Draft (Dredge Depths)

State of Infrastructure

Inventory:

- Slip 1
- Slip 2
- Liquid Cargo Pier
- Municpial Moring Basin
- Pier Wisconsin
- Lake Express

Condition:

- Port draft areas have historicaly required little maintenance dredging
- Federal Channel and Harbor Area dredge responsibility contributes to light burden.

Level of Service

- Maintain current dredge depth
- (e.g. 27 ft for Seawaymax)
- Provide drafts for projected low lake levels.

Renewal Strategies

- Factor long-term projections for lake levels in renewal planning.
- Consider system approach with dockwalls (dockwalls may need to be modified or changed during replacement to accommodate change in level of service)

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RENEWAL PLAN FEEDBACK

Fencing

State of Infrastructure

Inventory (In-Progress):

- Still assessing inventory
- Largely unified type through commercial port area (Chain link, 8-ft, 3 strand)
- Some decorative security fencing

Condition:

- Overall in good condition.

Level of Service

- Maintain in good condition
- Provide security

Renewal Strategies

- Consider future security factors
- Establish fencing standard to ensure continued unification in type

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RENEWAL PLAN FEEDBACK

Green Infrastructure & Public Spaces

State of Infrastructure

Inventory:

- North Urban Park
- Public Waterfront:
  - Russel Avenue Pier and Walkway
  - Adajacent to Lake Express
  - Pier Wisconsin
  - Dock Beneath Hoan Bridge
- Stormwater Pond (Parcel C)
- Grand Trunk Wetlands (in coordination with DCD)

Level of Service

- Accessibility
- Good Condition
- Meet regulatory requirements

Renewal Strategies

- Maintain in good condition

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RENEWAL PLAN FEEDBACK

Lighting

State of Infrastructure

Inventory (In-Progress):

- Mixed inventory (street lighting, bollard lighting, building exterior lighting)

Level of Service

- Maintain in good condition
- Provide security

Renewal Strategies

- Unify type / Align with City Standards
- Factor energy efficiencies into replacements (e.g. LED)
- Consider opportunities for incorporating renewable energy sources
- Consider future security factors

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RENEWAL PLAN FEEDBACK

Vehicles, Vessels, Cranes, and Other Equipment

State of Infrastructure

Inventory (In-Progress):

- Fleet Vehicles
- Vessels (2 workboats, 1 survey boat)
- Cranes (Gantry, Stiff Leg Derrick, Crawler (3), Truck Crane)

Level of Service

- Maintain in good condition

Renewal Strategies

- Consider new technologies (e.g. hybrid, EV fleet)

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CARP Information Session #1
Thursday, February 18 - 1pm to 3:30om
Attendee List

NAME	COMPANY	EMAIL	CONF. EMAIL SENT
Lynn Lafond	Fednav		Yes
Selena Cole	Port Milwaukee		Yes
Nelson G. Goodwin	Union Pacific Railroad		Yes
Steve Rose	Redwood Logistics		Yes
Bob McInnes	Seascouts		Yes
Rich Pecard	Seascouts		Yes
Louis Saint-Cyr	Federal Marine Terminals		Yes
Aaron Bensinger	Intership (Chicago)		Yes
Marie-Adree Giuere	Fednav		Yes
Kevin Tyszkiewicz	Tata Steel Europe		Yes
Matthew Schwister	XPD Security		Yes
Timothy Thur	COM Dept. of Public Works		Yes
Matthew McPhail	Federal Marine Terminals		Yes
Adam Bechle	University Of Wisconsin Sea Grant Institute		Yes
Steve Smiley - Sea Scouts			

CARP Informational Session #2
Friday, February 19, 2021 - 9:30am to Noon
Attendee List

NAME	COMPANY	EMAIL	CONf. EMAIL SENT
Taylor Holterman	Union Pacific Railroad		Yes
Kyle Gorman	COFCO		Yes
Frank Nicotera	Milwaukee World Festivals		Yes
Jim Bohl	COM Intergovernmental Relations Division		Yes
Bo DeLong	The DeLong Company		Yes
Roy Pelland	Cargill Salt		Yes
Keith Trafton	The Bartolotta Restaurants		Yes
Monica Wauck-Smith	COM Dept. Of City Development		Yes
Paul Bartolotta	The Bartolotta Restaurants		Yes
Bob Koepsell	Michels Corporation		Yes
Mark Matziger	Collins Engineers		Yes
Claude Krawczyk	BHC		Yes
Juan P. Montalvo	Union Pacific Railroad		Yes
John Luckey	XPD Security		Yes
Mark Barker	Interlake Steamship		Yes
John D. Baker, Jr.	International Longshoremen's Association		Yes
Michael Baker	International Longshoremen's Association		Yes
Ethan Johnson	Southeastern Wisconsin Regional Planning Commission		Yes
Kyle Weitzell	USCG Sector Lake Michigan		Yes
Nelson G. Goodwin	Union Pacific Railroad		Yes
Tina Kimble	Tata Steel Europe		Yes
William Baines	Kinder Morgan		Yes
Douglas Gold	FMT Milwaukee		Yes