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ALTERNATIVE USES OF THE RAILCAR FERRY S.S. CHIEF WAWATAM

STATE OF MICHIGAN
DEPARTMENT OF TRANSPORTATION

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Prepared by:

TEMPLE, BARKER & SLOANE, INC.
33 HAYDEN AVENUE
LEXINGTON, MASSACHUSETTS 02173

April 1986

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U.S. DEPARTMENT OF COMMERCE NOAA
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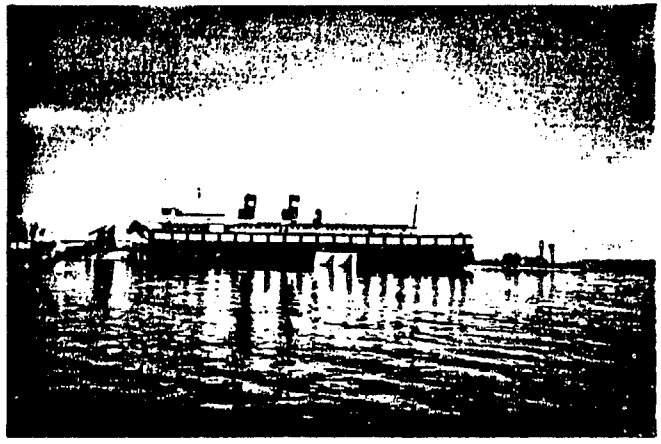
EXECUTIVE SUMMARY

PURPOSE OF THE STUDY

- The State of Michigan through the Department of Transportation (MDOT) has owned the S.S. CHIEF WAWATAM (the CHIEF) since 1977. The state provided a subsidy for operation of the CHIEF for railcar freight service across the Straits of Mackinac from April 1976 to August 1984. Because the need for freight service has diminished, the state is considering alternative uses for the CHIEF.

Figure 1

The CHIEF moored at Mackinaw City Terminal (Site M-1)



- Representatives of the communities of Mackinac City and St. Ignace have approached the state for nontransportation use of the CHIEF. MDOT and the Department of Natural Resources (MDNR) undertook a program to identify alternative uses. In August 1985, MDOT and MDNR commissioned Temple, Barker & Sloane, Inc. (TBS) to perform a feasibility study, analyzing alternative uses, costs, potential financial participation, alternative sites, and regulations. Community involvement was an important part of the study.

STUDY APPROACH

- TBS performed the study through a series of interviews, on-site investigations, cost analyses, and public meetings. Many of these tasks were performed concurrently and some were repeated as new information became available.

- TBS held in-person and telephone interviews with numerous public officials and representatives of private organizations who were either interested in alternative uses of the CHIEF or knowledgeable about the vessel, the region, maritime museums, laws and regulations, fund raising, or other aspects of the project.

- TBS presented project briefings in Mackinaw City and St. Ignace in conjunction with public meetings held by MDOT on December 4, 1985, to inform and gather information from the public.

- The TBS Project Manager and personnel from the subcontractors, White Elephant Management (WEM) and United Design Associates (UDA), made a series of visits to the CHIEF to determine the physical condition of the vessel, identify the ship's spaces available for alternative uses, evaluate accessibility to these spaces, and determine the scope of conversion requirements for the cost analyses.

- TBS and UDA also visited eight alternative sites in Mackinaw City and St. Ignace to observe their physical characteristics and evaluate their suitability for mooring the CHIEF.

- TBS, WEM, and UDA performed a series of cost analyses to determine restoration, conversion, and maintenance costs of the vessel and its mooring for the three best alternative uses and for the eight alternative sites.

- TBS, with assistance from WEM and UDA, prepared the final report.

SELECTION OF BEST USES

- The recommended best use for the CHIEF is a permanently moored floating museum operated on a not-for-profit basis. The next best uses are a museum with shops on board and a museum with a restaurant on board.

Best Use--Museum

- A permanently moored floating museum would fit well with the type of tourist attractions available in the Straits area. It could provide an important part of the twentieth-century historical record of the region and the maritime industry on the Great Lakes.

  --Physical Feasibility: There is no space constraint for museum development. Exhibits would be prepared to show use of the vessel in the wheelhouse, engine room, and boiler room, and on the rail deck. Staterooms and the galley could be refurbished to show the crew's living quarters. Other exhibits of marine-related topics could also be developed on the rail deck. Modifications for walking access to the visited spaces would include decking, handrails, lighting, and asbestos insulation sealing.

  --Local Acceptability: A museum is the ultimate means of using the vessel as a representation of the historical and social role that the CHIEF has played in the region. This use has received the broadest basis of support throughout the region.

  --Regulatory Constraints: By keeping the vessel afloat and permanently moored there would be no significant regulatory constraints imposed by the U.S. Coast Guard, U.S. Army Corps of Engineers, or the MDNR. State or local regulations concerning health, safety, and handicapped access would apply.

SELECTION OF BEST USES (continued)

--Management Feasibility: A museum or historical society could be established on a not-for-profit basis to manage the use of the CHIEF. A private business or city-owned agency may be less desirable from the regional perspective. The inclusion of the CHIEF within the Mackinac Island State Park Commission's system would provide an institution with existing capabilities for managing the museum.

--Cost: The cost of preparing the CHIEF to open as a museum is estimated at $545,000, with an annual maintenance and management cost of $274,000. This does not include the costs of site acquisition and preparation or towing to the site, which vary according to the chosen site. Additional costs for full restoration of the vessel and development of complete exhibits are estimated at $1,425,000.

--Potential Income: The income will come from museum admissions and sales at the museum shop. This will be an integral part of the museum and is not a joint-use shop described in the next best alternative. With sales of 86,000 tickets at $3.00 each during the five seasonal months of operation, $258,000 could be raised. Annual gift shop profits are estimated at an additional $15,000. The total ($273,000) will break even with the annual museum maintenance and management costs.

Second Best Use--Museum with Shops

- This joint use would keep the museum not-for-profit and use some of the staterooms on the upper decks and convert them into shops that would be leased to vendors. An alternative would be to build shops in boxcars that would be fixed on the rail deck. Vendors would pay an annual or monthly rent to the museum. An arrangement could be made to charge for basic services plus a percentage of vendor revenues.

SELECTION OF BEST USES (continued)

Third Best Use--Museum with Restaurant

- This joint use would also keep the museum not-for-profit but operate a restaurant on a for-profit-basis. It would require the acquisition and refurbishment of three rail dining cars to be placed on the rail deck or on tracks ashore leading to the CHIEF. A new full kitchen could be built on board the vessel to provide complete meal service. Alternatively, the cars could be limited to a snack service in self-contained dining cars.

OTHER USES

- The other recommended uses for the CHIEF diverge further from the selection criteria than the three top selected uses.

Performing Arts Center

- Conversion of the rail deck would significantly alter the structure and stability of the vessel. The cost of conversion is estimated at $1.0 million to $3.0 million. There is no apparent widespread popular support for this use. Tourism in the region is directed more toward sightseeing of historical places than attending musical or dramatic performances.

Convention Center

- With similar structural changes for a large meeting hall and additional modifications for smaller meeting rooms, the cost is estimated at $1.5 million to $3.5 million. This use does not include overnight guests.

OTHER USES (continued)

Sleeping Accommodations

- Sleeping accommodations on board the permanently moored CHIEF for a hotel, bed and breakfast, or a youth hostel would impose additional health and safety requirements from the state or local fire marshal or building inspector. Additional personnel would be needed to provide sufficient fire and safety security for overnight visitors aboard the ship. There may be a significant loss in local support from motel owners who would see this use as competitive.

Traveling Museum

- The major problem with a traveling museum would be the high cost of operating the CHIEF. Direct operating costs are estimated at an additional $82,075 per year. There would be additional maintenance costs and annual costs for winterizing and startup. It is not clear that there will be greater museum revenues at multiple locations.

Excursion Vessel

- Using the CHIEF for short term excursions, that would not require overnight accommodations, would still be a major shift in the use of the vessel and would require extensive renovations to accommodate regulatory requirements of the Coast Guard. The vessel is now classed to carry freight and not passengers. An entirely new regulatory regime is imposed for passenger carrying vessels. The cost increase would be very large to pay for the required alterations, equipment, and possibly increased crew size.

OTHER USES (continued)

Passenger Cruise Ship

- Adding overnight accommodations would require still further modifications. Round-the-clock cruising would significantly increase crew requirements. This use would require a significant investment by a cruise operating company with extensive experience in marketing and operating such a service.

Superstructure on a Pier

- This alternative would destroy the unity of the historical vessel by removing the wooden superstructure for use on a pier to house shops or a restaurant. This is the part of the vessel that has suffered the most from weathering and is the most difficult to restore. The strongest part of the CHIEF--its hull--would be scrapped with this use.

Breakwater

- Use as a breakwater would eventually destroy the CHIEF. If it were put aground and surrounded by rock and fill, there would be no way to inspect, repair, or renew the external area of the hull below the waterline. The deterioration would take some time, but the vessel would have no possibility of indefinite life, as it would if it were permanently moored afloat. There are also regulating constraints regarding the use of bottom lands.

ALTERNATIVE SITES

- TBS identified eight sites that satisfied most, if not all, of the selection criteria developed in the study. Five are located in St. Ignace and three in Mackinaw City. Engineering analyses were performed to determine modifications that would be required to the shore, existing piers, and submerged land to prepare for the permanent mooring of the CHIEF. Costs of the modifications were estimated.

S-1. St. Ignace--Railroad Pier

- The site is the former St. Ignace terminal for the CHIEF that is owned by the Soo Line Railroad; 3.4 acres are available for adjacent parking. The site is very visible in downtown St. Ignace. The cost to prepare the site is estimated at $886,470.

S-2. St. Ignace--Merchandise Pier

- The site is the ruins of the former merchandise pier owned by the City of St. Ignace, and is just south of the Soo Line terminal site. There are 3.8 acres available for adjacent parking. The cost to prepare the site is estimated at $1,379,000.

S-3. St. Ignace--State Car Ferry Pier

- The site, the State Car Ferry Pier, which is owned by the City of St. Ignace, is next to the Coast Guard station; 5.7 acres are available for adjacent parking. The site is not visible either from St. Ignace or from the Mackinac Bridge. The cost to prepare the site is estimated at $599,200.

ALTERNATIVE SITES (continued)

S-4. St. Ignace--Northwest Oil Terminal

- The site is land owned by W. R. Grace & Co.--on the north side of the St. Ignace harbor. The site is very visible from downtown St. Ignace. The cost to prepare the site is estimated at $1,911,000.

S-5. St. Ignace--West Side of Straits Bridge

- The site is land owned by the City of St. Ignace at the north end of the bridge to the west of the bridge approach. There are 9.6 acres available for adjacent parking. The site is very visible to northbound traffic on the Mackinac Bridge. The cost to prepare the site is estimated to be $1,991,950.

M-1. Mackinaw City--Railroad Pier

- The site is the former Mackinaw City terminal for the CHIEF, where she is currently moored. This is owned by the Detroit and Mackinac Railroad. The site is very visible from downtown Mackinaw City and from the southbound lanes on the Mackinac Bridge. There are 2.5 acres across Huron Avenue for parking. The cost to prepare the site is estimated at $807,850.

ALTERNATIVE SITES (continued)

M-2. Mackinaw City--State Car Ferry Pier

- The site is the south side of the State Car Ferry Pier in Mackinaw City, owned by the State of Michigan. The site is very visible from downtown Mackinaw City and from the southbound lanes of the Mackinac Bridge. Parking is available on the pier. The cost to prepare the site is estimated at $893,500.

M-3. Mackinaw City--Ferry Pier Breakwater

- The site is the north side of the State Car Ferry Pier. Lying in a north/south direction, the CHIEF would be grounded in position as a breakwater. The site is owned by the State of Michigan and is very visible from downtown Mackinaw City and from the southbound lanes of the Mackinac Bridge. Parking is available on the pier. The cost to prepare the site is $753,400.

REGULATORY CONSTRAINTS

- Any plans for use of the CHIEF would need to comply with regulatory requirements imposed by federal, state, and local agencies to protect people, property, and the environment.

- The Coast Guard relinquishes jurisdiction over floating vessels that are used for other (nonmaritime) purposes when they are permanently moored and thus taken out of navigation. The Coast Guard notifies the appropriate local authorities when the vessel is taken out of navigation so that appropriate local safety codes may be applied. The Coast Guard will allow the CHIEF to be placed in navigation periodically so that it can be towed to a shipyard for drydocking and repairs.

REGULATORY CONSTRAINTS (continued)

- The U.S. Army Corps of Engineers regulates obstructions or alterations of navigable waters of the United States and the discharge and transportation of dredge spoil. In the event that a site that requires dredging is chosen, the CHIEF will need permits so that it can be placed in its permanent mooring and so that new piles can be built. Federal permits are issued in cooperation with the MDNR.

- In addition to regulating new mooring structures and the discharge and transportation of dredge spoil, the MDNR has the responsibility of protecting public bottom lands in state waters. Any dredging project in these waters would require a permit.

- The Bureau of History in the Michigan Department of State has responsibility for maintaining the Register of Historical Sites and encouraging historical preservation of these sites. In some cases, historical preservation is in conflict with barrier-free design for public access.

- The state building code is maintained by the Bureau of Construction Codes in the Michigan Department of Labor. The state code is applicable to all state buildings, which include structures within the jurisdiction of the Mackinac Island State Park Commission. Counties and municipalities also adopt the state code for buildings under their jurisdiction. A portion of the code is concerned with restricted access for the handicapped. The state has established a Barrier Free Design Board, which is empowered to make exceptions to the design requirements for compelling reasons that include historical preservation.

FINANCIAL PARTICIPATION

- The most appropriate way to preserve the CHIEF as a historical structure is as a museum, because it minimizes change to the vessel and emphasizes preservation.

- There should be no false expectations that the vessel will pay for itself easily as a museum. Admission may defray a large part of the museum operating expenses, but the ship is a large, complex structure in need of much maintenance. The five-month tourist season is short. It is difficult to envision the ship being well maintained without subsidy or endowment.

- Many maritime museums attempt to run in the black as a business, but even if they succeed on paper, the vessels are usually found to be steadily corroding away due to lack of major maintenance.

- The order of magnitude of the project requires vision by the larger communities of the state and the nation to see the CHIEF's place in the region and its national historical significance. The vessel is an extremely valuable artifact. It would be a great tragedy to lose it for want of appreciation or vision by the public beyond the local area.

Sources of Funds

- The CHIEF will definitely require sources of funding beyond expected revenues from admissions and souvenirs and any leases from shops or a restaurant. One potential source is from contributions through the dues structure of a Maritime Society.

FINANCIAL PARTICIPATION (continued)

- Private funds can be raised for maritime museums but require a carefully organized group of local, regional, and national participants. It is important that the fund-raising organization be as broad-based as possible and include people and organizations with a variety of interests such as historical, Great Lakes, maritime industry, railroads, Michigan, industries that used the railcar ferry service, Mid-West, Canadian, and other types of interests that are connected to the CHIEF.

- The best approach to obtain major funding is a well-formed group that has a carefully organized plan and that uses business techniques to describe its intentions, expectations, and chances for success.

- The local governments may provide limited funds. In its 1986 budget, the Village of Mackinaw City appropriated $25,000 for use on the CHIEF. The state, through the Mackinaw Island State Park Commission, may be a source of start-up funds if the Commission decides that the CHIEF will support its mission.

- There were few indications of local private financial support for the CHIEF. The Mackinaw County Economic Development Corporation of St. Ignace expressed a willingness to support promotions and advertising for the CHIEF, in keeping with the organization's mission. Conversations with major local passenger ferry operators did not develop any apparent sources of funding.

- Many costs could be saved in restoration and maintenance of the CHIEF through the use of volunteer time. This would require a program to solicit volunteers, develop projects, establish schedules, and maintain enthusiasm. Donations of furnishings, spare parts, railcars, and other relevant materials can significantly reduce the need for cash donations.

I. BACKGROUND

- The S.S. CHIEF WAWATAM (the CHIEF) is a hand-fired, coal-burning, ice-breaking railcar ferry that has served Northern Michigan across the Straits of Mackinac from 1911 to 1984. After the completion of the Mackinac Bridge in the 1950s and the changes in demand for freight transportation, the subsequent shifts in freight transportation modes reduced the need for ferry service. The State of Michigan took ownership of the CHIEF in 1977 and provided subsidies for freight service operations from April 1976 to August 1984.

- The CHIEF is an historic vessel because of both its design and its year-round use in the Straits for 73 years. It is listed in the State of Michigan Register of Historical Sites. Most residents in the Straits region have close connections with the ship through personal experiences or via relatives or friends. The CHIEF has been an integral part of their lives for many years.

- The CHIEF'S unique historical nature derives from the following descriptive characteristics:

  --Railcar ferry

  --Built in 1911

  --Bow loading to four tracks

  --All steel, riveted hull construction

  --Icebreaker hull

  --Six hand-fired, coal-burning, Scotch-type steam boilers (see Figure I-1)

--Three 1,500 HP triple expansion steam engines with three cylinders each

--Triple screw with one bow propeller and two stern propellers

Figure I-1

Fireroom showing hand-fired coal boilers.

II. STUDY OBJECTIVES

- In August 1985, the Department of Transportation (MDOT) and the Department of Natural Resources (MDNR) for the State of Michigan requested that Temple, Barker & Sloane, Inc. (TBS) conduct a feasibility study of alternative uses of the railcar ferry S.S. CHIEF WAWATAM. The study was to include analyses of alternative vessel uses, costs, and potential financial participation; alternative site locations and costs; pertinent regulatory constraints; and opportunities for community involvement. The following sections of this chapter list TBS's particular objectives for each of these aspects of the study.

VESSEL USES, COSTS, AND POTENTIAL FINANCIAL PARTICIPATION

- Identify the best and next two best alternate uses of the CHIEF

- Estimate costs of vessel conversion for these uses

- Estimate costs of general maintenance after conversion to alternative uses

- Analyze potential strategies for obtaining joint community and private financial participation for each public use

ALTERNATIVE SITE LOCATIONS AND COST

- Define desirable site characteristics for location of the CHIEF
- Identify potential mooring areas and their owners in Mackinaw City and St. Ignace
- Estimate costs for establishing new mooring facilities or preparing existing facilities for use by the CHIEF
- Estimate tug costs to move the CHIEF to alternative locations
- Estimate costs to make permanent moorings to withdraw the CHIEF from U.S. Coast Guard jurisdiction
- Determine significant land changes required for adjacent public access, parking, sanitation, utilities, etc.

REGULATORY CONSTRAINTS

- Determine any regulatory constraints affecting the use or location of the CHIEF that would be imposed by:

  --Michigan Department of Natural Resources (DNR) Division of Land Resource Programs

  --Michigan Department of State, Bureau of History

  --U.S. Corps of Engineers (COE)

  --U.S. Coast Guard (USCG)

  --Local agencies

COMMUNITY INVOLVEMENT

- Conduct in-depth interviews with key St. Ignace and Mackinaw City officials and interested parties

- Participate in public meetings scheduled by MDOT to obtain public input and reactions to the study

III. GENERAL APPROACH

STUDY APPROACH

- TBS performed the study through a series of interviews, on-site investigations, cost analyses, and public meetings. Many of these tasks were performed concurrently and some were repeated as new information became available.

INTERVIEWS

- TBS held in-person and telephone interviews with numerous public officials and representatives of private organizations who were either interested in alternative uses of the CHIEF or knowledgeable about the vessel, the region, maritime museums, laws and regulations, fund raising, or other aspects of the project. Interviews were held with the following people:

--Municipal Officials

- Lewis J. Steinbrecher--Village Manager, Mackinaw City
- Gary Heckman--City Manager, St. Ignace

--Local Community Organizations

- Gary L. Reid--Director, Mackinac County Economic Development Corporation
- Carol L. Jenkins--Mackinac County Economic Development Corporation
- Bob Barker--Mackinaw Area Tourist Bureau, Inc.
- Debby McNeal--Greater Mackinaw City Chamber of Commerce

--Michigan State Officials

- Carol C. Norris--Deputy Director, Bureau of Urban and Public Transportation, Department of Transportation
- Susan G. Brook--Administrator, Freight Division, Department of Transportation
- Pauline Misjak--Manager, Operations Section, Freight Division, Department of Transportation
- Don Moore--Operations Section, Freight Division, Department of Transportation
- Katherine Eckert--Supervisor of Historic Preservation, Bureau of History, Department of State
- Robert Christensen--Bureau of History, Department of State
- Michael Kessler--Division of Land Resource Programs, Department of Natural Resources
- Mogens C. Nielsen--Division of Land Resource Programs, Department of Natural Resources
- John Arnsman--Division of Land Resource Program, Department of Natural Resources
- Keith Wilson--Chief, Waterways Division, Department of Natural Resources
- Robert Olson--Chief of Design, Waterways Division, Department of Natur Resources
- Robert Birch--Division of Forest Management, Department of Natural Resources

- Margaret A. Nelson--Assistant Attorney General, Transportation Division
- Lt. Robert Endelman--State Fire Marshall, Department of State Police
- Henry L. Green--Deputy Director, Bureau of Construction Codes, Department of Labor

--Federal Officials

- Commander Hardin--Officer in Charge of Marine Inspection, U.S. Coast Guard, St. Ignace, MI
- Robert Tucker--U.S. Army Corps of Engineers, Detroit, MI

--Transportation Company Representatives

- Prentis (Moey) Brown, Jr.--Owner, Arnold Transit Company (Mackinac Island Ferry)
- William Shepler--President, Shepler's Ferry (Mackinac Island Ferry)
- Gerald Smith--Former President, The Boat Company (previously operated the CHIEF)
- Joseph P. Darling--Vice President, Planning, Soo Line Railroad
- Terry Lee--Soo Line Railroad
- Roger Moffatt--Executive Vice President, Detroit and Mackinac Railroad Company
- David Kish--General Counsel, Delta Queen Steamboat Company

--Museum Developers and Operators

- Kenneth C. Teysen--Commissioner, Mackinac Island State Park Commission
- David Armour--Acting Superintendent, Mackinac Island State Park Commission
- David C. Brink--Galveston Historical Foundation
- Peter Stanford--National Maritime Historical Society
- Conrad Milster--Pratt Institute
- Thomas Manse--Le Sault de Sainte Marie Historical Sites, Inc. (S.S. VALLEY CAMP)
- Capt. John P. Wellington--Le Sault de Sainte Marie Historical Sites, Inc. (S.S. VALLEY CAMP)

--Utilities

- Don Purnell--Consumers Power Company, Cheboygan
- Don Olmstead--Edison Sault Electric Co., St. Ignace
- John Dott--Michigan Power Company, Marquette
- Jack Elder--Michigan Consolidated Gas Co.
- Bruce R. Boring--Michigan Bell
- George W. Kinsella--Michigan Bell, Sault Ste. Marie

--Other Sources

- William Warden--Detroit Historic Advisory Board
- Eugene Andrezejewski--President, Andy's Engineering, Incorporated
- Frances D. Burgtorf--Author, Chief Wawatam, The Story of a Hand Bomber
- Professor Harry Benford--Department of Naval Architecture and Marine Engineering, University of Michigan
- Bonnie D. McArthur--Hostel Development Coordinator, Michigan Council, American Youth Hostels, Inc.
- George Yshinski--State Wide Real Estate, St. Ignace
- Theodore Utchen--Attorney, Chauncey and Marion Deering McCormick Foundation
- John Schlack--Engineer for Mackinaw City at United Design Associates

PUBLIC MEETINGS

- TBS presented project briefings in Mackinaw City and St. Ignace in conjunction with public meetings held by MDOT on December 4, 1985, to inform and gather information from the public.

INSPECTION OF THE VESSEL

- The TBS Project Manager and personnel from the subcontractors, White Elephant Management (WEM) and United Design Associates (UDA), made a series of visits to the CHIEF to determine the current physical condition of the vessel, identify the ship's spaces that were available for alternative uses, evaluate accessibility to these spaces, and determine the scope of conversion requirements for the cost analyses.

INSPECTION OF ALTERNATIVE SITES

- TBS and UDA also visited eight alternative sites in Mackinaw City and St. Ignace to observe their physical characteristics and evaluate their suitability for mooring the CHIEF.

ANALYSIS OF COSTS

- TBS, WEM, and UDA performed a series of cost analyses to determine restoration, conversion, and maintenance costs of the vessel and its mooring for the three best alternative uses and for the eight alternative sites.

FINAL REPORT

- TBS, with assistance from WEM and UDA, prepared the final report.

IV. ALTERNATIVE USES

TYPES OF USES

- Over the course of the study, a number of alternative uses for the CHIEF were proposed. They can be classified under three categories of use for the vessel: fixed mooring, mobile operation, and non-permanent life.

Fixed Mooring

- Most of the uses for the CHIEF that have been identified would keep the vessel afloat and permanently moored at Mackinaw City or St. Ignace. These alternative uses are:

  --Museum: The vessel would be restored to its former condition and prepared to handle visitors. This would involve repairing deteriorated superstructure, refurbishing interior spaces, and developing exhibits in the engine room, staterooms, wheelhouse, and rail deck.

  --Museum Jointly with Other Uses: The vessel would be restored and converted as above, but provision would be made to use portions of the CHIEF for other purposes. Possible joint uses include:

    - Shops: Staterooms could be converted into shops that would offer gifts, crafts, historical reproductions, Indian lore, or maritime accessories for sale. An alternative would be to modify boxcars on tracks on the main deck as shops.

    - Restaurant: The galley and messing area in the crews quarters could be restored and developed as a restaurant. Crew staterooms could also be converted into additional dining spaces. A railcar alternative could use dining cars on the main deck rails or outside the ship on the loading tracks where the view through the dining

car windows would be more scenic than the interior bulkheads of the train deck. Either type of restaurant could serve preprepared meals or use renovated galley facilities or have a new kitchen installed on the ship.

- Performing Arts Center: The main deck could be modified into an auditorium to provide a stage and seating area over the rail tracks for musical and dramatic performances.

- Convention Center: Meeting rooms would be required. These could be added with modifications of the crews staterooms or by enclosing the rail deck to make additional rooms. A large meeting area similar to the auditorium for the performing arts center would be useful for general meetings. The convention center could be designed to include hotel and restaurant facilities or could have only meeting rooms with the staterooms and galley spaces converted to this use.

- Sleeping Accommodations: The staterooms could be refurbished to provide sleeping accommodations for a hotel, bed and breakfast, or youth hostel. Bathing and toilet facilities should be improved for this use. Food preparation facilities would also be needed.

Mobile Operation

- If it were not permanently moored, but kept able to steam on the Great Lakes, alternative uses for the CHIEF would include:

  --Traveling Museum: The ship would be converted to a museum but not permanently moored. It would steam or be towed to various locations and receive visitors at each port of call. Overnight accommodations for crew could be restored for long voyages. No passengers would be carried when under way.

--Excursion Vessel: The ship would be used for short trips carrying passengers on excursions to locations near the Straits. The trips would be designed for special purposes or events such as a visit to a historical site or for a jazz cruise. A special seating area for accommodating the passengers would be installed. No sleeping facilities would be installed.

--Passenger Cruise Ship: This alternative is to convert the ship to a passenger carrying cruise ship with overnight accommodations for passengers and crew. Since the sleeping spaces were originally designed for the crew only, modifications would be necessary for additional staterooms as well as the restoration of former crews quarters, galley, and mess deck.

Non-Permanent Use of the CHIEF

- The remaining uses would not keep the CHIEF as a permanent historical site. It would be used in a manner that would break down the physical integrity of the vessel either immediately or over time. These uses are:

  --Superstructure on a Pier: The superstructure would be removed and placed on a pier for use as a museum, restaurant, or shops. The hull would be scrapped.

  --Breakwater: The CHIEF would be grounded and rip rap (i.e., large rocks) would be built up alongside, creating a protective barrier for a small craft marina. The ship could also be used as a museum or for any other stationary use until deterioration of the hull eventually required abandonment and removal as a safety measure.

CRITERIA FOR SELECTION OF BEST USES

- Criteria were developed to provide an initial screen of all proposed uses for the CHIEF. Both quantitative and qualitative criteria were applied. In most cases, the quantitative measures used rough estimates of costs and income that were sufficient to provide the ranking necessary to select the best and next two best uses for further detailed analysis. The criteria are listed below.

Physical Feasibility

- Is there enough space on board the CHIEF to permit the alternative use?

- What modifications would be required to adapt the vessel to the use?

Local Acceptability

- Is the use in keeping with the historical and social role that the CHIEF has played in the region and in Michigan's maritime industry?

- Will there be local support for this form of public use of the vessel?

Regulatory Constraints

- What are the local, state, and federal laws and regulations that would be applied to this use?

- What modifications would be required to adapt the vessel to the use?

Management Feasibility

- What type of management would be required?

- Is an organization available, or potentially available, to manage this use?

Costs

- What are the costs of conversion, modification, operation, and maintenance for the alternative use?

Potential Income

- What sources of income can be expected from this use?

- How much income is necessary to break even with annual maintenance and operating costs.

SELECTION OF BEST USES

- The recommended best use for the CHIEF is a permanently moored floating museum. The next best uses are a museum with shops on board and a museum with a restaurant on board.

Best Use--Museum

- A permanently moored floating museum would fit well with the type of tourist attractions available in the Straits area. It could provide an important part of the twentieth-century historical record of the region and the maritime industry on the Great Lakes. The CHIEF is a unique reminder of the era predating the construction of the Mackinac Bridge.

  --Physical Feasibility: There is no space constraint for museum development. Exhibits would be prepared to show use of the vessel in the wheelhouse, engine room, and boiler room, and on the rail deck. Staterooms and the galley could be refurbished to show the crew's living quarters. Other exhibits of marine-related topics could also be developed on the rail deck. Modifications for walking access to the visited spaces would include decking, handrails, lighting, and asbestos insulation sealing.

  --Local Acceptability: A museum is the ultimate means of using the vessel as a representation of the historical and social role that the CHIEF has played in the region. This use has received the broadest basis of support throughout the region.

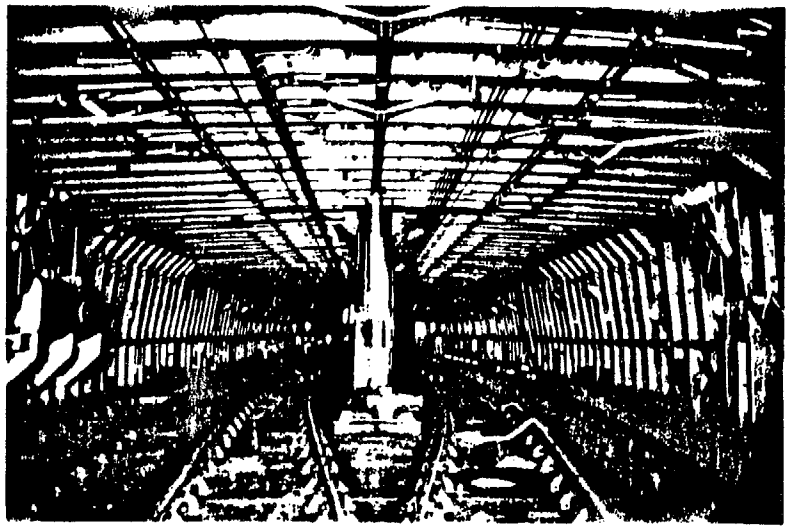
  --Regulatory Constraints: By keeping the vessel afloat and permanently moored, as described in Chapter VI below, there would be no significant regulatory constraints imposed by the U.S. Coast Guard, U.S. Army Corps of Engineers, or the Michigan Department of Natural Resources. State or local regulations concerning health, safety, and handicapped access would apply.

    - The principal modification to the vessel would be for wheelchair access to the rail deck (see Figure IV-1). Because of existing limited access to the upper and lower decks, an exemption may be required from the Michigan Barrier Free Design Board to eliminate the need for an elevator installation for the handicapped. An elevator would be very expensive and would require extensive modifications that

conflict with the preservation objective. It would also seriously impair the watertight integrity of the vessel by providing a path for flooding from the main deck to the engine room.

Figure IV-1

Rail deck, looking aft.



--Institutional Capability: A museum or historical society could be established on a not-for-profit basis. A private business or city-owned agency may be less desirable from the regional perspective. The inclusion of the CHIEF within the Mackinac Island State Park Commission's system would provide an institution with existing capabilities for managing the museum.

--Cost: The cost of preparing the CHIEF to open as a museum is estimated at $545,000, with an annual maintenance and management cost of $274,000. This does not include the costs of site acquisition and preparation or towing to the site, which vary according to the chosen site and which are described in Chapter V. Additional costs for full restoration of the vessel and development of complete exhibits are estimated at $1,425,000. These figures are summarized in Table IV-1 and detailed in Appendix A.

Table IV-1

WATERSIDE COST OF MUSEUM[1]

Initial Cost	
Vessel stabilization	$ 310,000
Minimum museum preparation	235,000
Total	$ 545,000
Annual Cost	
Vessel maintenance	$ 110,000
Museum maintenance	27,000
Dockside Maintenance	10,000
Museum management	127,000
Total	$ 274,000
Full restoration and development	$1,425,000

[1]Excludes costs of site aquisition, site preparation, site maintenance and towing to site.

--Potential Income: The income will come from museum admissions and sales at the museum shop. The shop will sell a range of products from artifacts to nautical books to T-shirts. This will be an integral part of the museum and is not a joint-use shop described in the next best alternative. Table IV-2 shows that 86,000 tickets must be sold at $3.00 each during the five seasonal months of operation to raise $258,000. Annual gift shop profits are estimated at an additional $15,000. The total ($273,000) will break even with the annual museum costs. This assumes that the startup costs and full museum development costs would be funded by donation. The required income levels appear feasible when compared with the $160,000 and $166,000 in ticket sales for the S.S. VALLEY CAMP in Sault Ste. Marie in 1983 and 1984, respectively. The number of visitors in the Straits area is estimated to be at least two or three times the number visiting the Soo locks.

Table IV-2

REQUIRED ANNUAL MUSEUM INCOME[1]

TICKET SALES (@ $3.00/admission)

Month	Days	Tickets/Day	Tickets/Month	Revenue
May	31	200	6,200	$ 18,600
June	30	600	18,000	54,000
July	31	900	27,900	83,700
August	31	900	27,900	83,700
September	30	200	6,000	18,000
			86,000	$258,000
Gift shop profits				$ 15,000
Total				$273,000

[1]To recover annual expenses.

Second Best Use--Museum with Shops

- This joint use would take some of the staterooms on the upper decks and convert them into shops that would be leased to vendors. An alternative would be to build shops in boxcars that would be fixed on the rail deck. Vendors would pay an annual or monthly rent to the museum. An arrangement could be made to charge for basic services plus a percentage of vendor revenues.

  --Physical Feasibility: There is sufficient space to reuse staterooms for shops. The wooden joiner bulkheads would be altered to provide sufficient space for each shop out of two or three staterooms. For boxcar shops, ramps and handrails outside the cars would be needed and the cars would be modified inside for shop use.

  --Local Acceptability: The stateroom modifications would change the historical integrity of those spaces. More importantly, local merchants may feel that the museum is competing with their shops. It is noteworthy that the Mackinac Island State Park Commission has a policy to exclude concessionaires from their historical sites and museums.

  --Regulatory Constraints: The problem of access by the handicapped to the staterooms would continue, but shops in the boxcars with ramps would provide additional visiting points on the rail deck that would be accessible to all.

  --Institutional Capability: The museum staff would be required to negotiate and handle leases with the vendors. The presence of the shops may affect the not-for-profit status of the organization and have an impact on tax requirements.

  --Cost: The cost of converting the staterooms to shops is estimated at $218,000. For shops in four boxcars, the cost is estimated at $97,000. These costs are described in Appendix A.

--Potential Income: If staterooms were modified into eight shops, the annual lease revenue required to recover (in five years) the $218,000 investment and the annual cost of $17,000 for utilities and maintenance would be approximately $65,000 or $8,000 per shop. This would amount to $32.00 per square foot per year. Writing off the conversion costs, the lease rate to recover only the annual utility and maintenance costs would be $8.50 per square foot per year.

If four boxcars were used for four shops, lease revenue required to recover (in five years) the $97,000 investment and the annual cost of $17,000 for utilities and maintenance would be approximately $44,000 or $10,000 per shop per year. At 250 square feet per shop, this is $40.00 per square foot per year. Even though this is higher than $32.00 per square foot for the converted state rooms on the upper deck, the boxcars will be more visible and accessible on the rail deck.

Third Best Use--Museum with Restaurant

- This joint use would require the acquisition and refurbishment of three rail dining cars to be placed on the rail deck or on tracks ashore leading to the CHIEF. A new full kitchen could be built on board the vessel to provide complete meal service. Alternatively, the cars could be limited to a snack service in self-contained dining cars.

--Physical Feasibility: For the full service restaurant, a kitchen will have to be constructed on the rail deck, or the ship's galley re-outfitted and arrangements made for delivering meals from the upper deck to the rail deck. Space is available for a new kitchen. Ramps and handrails will be needed for the dining cars for use by the handicapped. To position the dining cars ashore, the vessel will need a site with laid rail track.

--Local Acceptability: The new kitchen will change the historical integrity of the rail deck, as will the dining cars to a lesser degree since they were never carried on the CHIEF. Competition with other restaurants in the area may discourage local support for this use.

--Regulatory Constraints: Additional local or state health requirements must be met concerning food services. These will affect layout, utility needs, and cleanliness requirements.

--Institutional Capability: The contract management requirements for the museum staff will be similar to the joint use with shops. Staff members should have additional knowledge about restaurant operations to maintain suitable control of the joint use. Tax considerations are again a potential problem.

--Cost: The cost of developing a restaurant in three rail dining cars and a kitchen aboard the CHIEF is estimated at $277,000. Annual costs for utilities and maintenance will be $31,000. For a snack bar in the three dining cars, without a full scale kitchen on board the vessel, the initial cost is estimated at $150,000 with annual costs of $5,000 for utilities and maintenance.

--Potential Income: If three dining cars were installed with a full kitchen, the lease revenue required to recover (in five years) the $277,000 investment and the annual cost of $31,000 would be approximately $70,000 per year. Table IV-3 shows that the three dining cars (open seven days a week and seating 40 people per car for lunch and dinner with occupancy rates varying within the season) can accumulate $50,112 if contributions to recovery of fixed costs are figured at $2.00 per lunch and $3.00 per dinner. Writing off the conversion costs, the contributions clearly would recover the $31,000 annual costs.

Table IV-3

EXPECTED ANNUAL CONTRIBUTION TO FIXED COSTS RECOVERY FROM DINING CAR REVENUES[1]

		Lunch[2]		Dinner[3]		
Month	Days	Occupancy Rate	Contribution	Occupancy Rate	Contribution	Total Contribution
May	31	30%	$2,232	20%	$2,232	$ 4,464
June	30	65%	4,680	50%	5,400	10,080
July	31	90%	6,696	80%	8,928	15,624
August	31	90%	6,696	80%	8,928	15,624
September	30	30%	2,160	20%	2,160	4,320
			$22,464		$27,648	$50,112

[1]Three dining cars seating 40 each and serving full meals.
[2]With $2.00 contribution from $7.00 lunch ($5.00 for variable costs).
[3]With $3.00 contribution from $12.00 dinner ($9.00 for variable costs).

OTHER USES

- The other recommended uses for the CHIEF diverge further from the selection criteria than the three top selected uses. Each of these other uses is listed below. Comments describe the major characteristics that eliminated each from selection.

Performing Arts Center

- Conversion of the rail deck would significantly alter the structure and stability of the vessel. The cost of conversion is estimated at $1.0 million to $3.0 million. There is no apparent widespread popular support for this use. Tourism in the region is directed more toward sightseeing of historical places than attending musical or dramatic performances.

Convention Center

- With similar structural changes for a large meeting hall and additional modifications for smaller meeting rooms, the cost is estimated at $1.5 million to $3.5 million. This use does not include overnight guests.

Sleeping Accommodations

- Sleeping accommodations on board the permanently moored CHIEF for a hotel, bed and breakfast, or a youth hostel would impose additional health and safety requirements from the state or local fire marshal or building inspector. A galley would have to be installed and rest rooms would have to upgraded. Additional personnel would be needed to provide sufficient fire and safety security for overnight visitors aboard the ship. There may be a significant loss in local support from motel owners who would see this use as competitive.

Traveling Museum

- The major problem with a traveling museum would be the high cost of operating the CHIEF. Daily operating costs in the summer months average $1,758 when steaming and $305 when moored. If the vessel were under way five days and moored 25 days per month for the five seasonal months, it would cost an additional $82,075 per year for direct, operating costs. There would be additional maintenance costs, and, to keep its Coast Guard certification, the drydocking would have to done every five rather than ten years. The drydocking alone would cost $20,000 per year on annualized basis. It is not clear that there will be greater museum revenues at locations away from the Straits. There would also be annual costs for winterizing and startup.

  There may be additional opportunities for revenue generation from special programs at other ports of call. One problem with keeping the vessel operational is that many of the museum exhibits that could be developed for the working spaces of a dead ship would not be feasible. Tours of the engine and boiler rooms would be more restrictive.

Excursion Vessel

- The vessel could be used for short excursions that would not require overnight accommodations. This would be a major shift in the use of the vessel and would require extensive renovations in accommodations, safety equipment, life saving equipment, manning levels, and other regulatory requirements of the Coast Guard. The vessel is now classed to carry freight and not passengers. An entirely new regulatory regime is imposed for passenger-carrying vessels. The cost increase would be very large to pay for the required alterations, equipment, and possibly increased crew size.

Passenger Cruise Ship

- Adding overnight accommodations would require still further modifications to the CHIEF to provide improved and additional sleeping quarters, rest rooms, and galleys for both crew and passenger use. Round-the-clock cruising would significantly increase crew requirements. This use would require a significant investment by a cruise operating company with extensive experience in marketing and operating such a service.

Superstructure on a Pier

- This alternative would destroy the unity of the historical vessel by removing the wooden superstructure for use on a pier to house shops or a restaurant. This is the part of the vessel that has suffered the most from weathering and is the most difficult to restore. The strongest part of the CHIEF--its hull--would be scrapped with this use.

Breakwater

- Use as a breakwater would eventually destroy the CHIEF. If it were put aground and surrounded by rock and fill, there would be no way to inspect, repair, or renew the external area of the hull below the waterline. The deterioration would take some time, but the vessel would have no possibility of indefinite life, as it would if it were permanently moored afloat. There are also regulating constraints regarding the use of bottom lands (i.e., land submerged below water level). The Michigan Department of Natural Resources and the U.S. Corps of Engineers would require a strong justification to give up portions of public bottom land for any use. In addition, regulations would require that any public bottom land occupied by the CHIEF to be compensated for by the transferral of private bottom land to the public domain.

V. ALTERNATIVE SITES

CRITERIA FOR SELECTION OF SITE

- Criteria were developed to evaluate the alternative sites in St. Ignace and Mackinaw City for their suitability to permanently mooring the CHIEF. The ideal site should be accessible, serviceable, and secure.

- Accessible: The site should have:

  --A large parking area dedicated for use by patrons of the CHIEF

  --Easy access for pedestrians from the parking area and street

  --Convenient ramp for truck access for loading and unloading equipment and supplies and for bus access for visitors

  --Railroad track connection for movement of railcars on and off the vessel

  --Highly visible location for the vessel

  --Convenient locations for signs

- Serviceable: The site should provide:

  --Electrical connections with sufficient voltage and power

  --Potable water connections with sufficient pressure and volume

  --Sewer hook ups with sufficient capacity

  --Source of space heat for habitability and preservation needs

  --Ability to unmoor and move to drydock when necessary for bottom inspection and repair

- Secure: The site should include:

  --Strong pier or other permanent fixture to provide secure mooring

  --Vessel positioned to minimize effect of wind and ice

  --Ease in controlling access to the vessel through fences and locked gates

  --Minimal need for security guards during off hours

IDENTIFIED SITES

- TBS identified eight sites that satisfied most, if not all, of the criteria. The locations are shown in Exhibit V-1. Five are located in St. Ignace and three in Mackinaw City. Engineering analyses were performed to determine modifications that would be required to the shore, existing piers, and submerged land to prepare for the permanent mooring of the CHIEF. Costs of the modifications were estimated and are presented in detail in Appendix A. The physical characteristics and cost requirements of each site are described in this chapter.

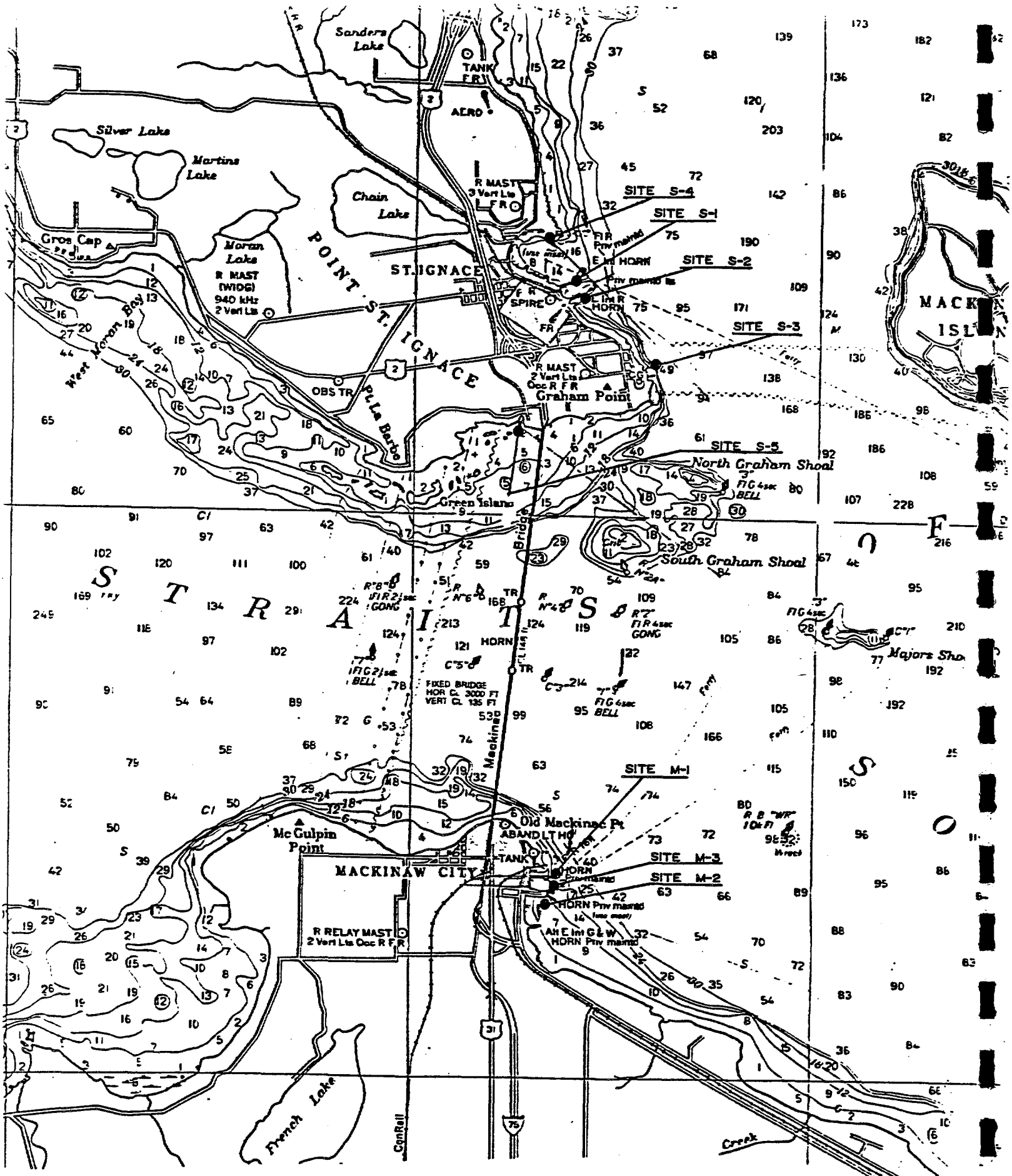


Exhibit V-1

AREA MAP

S-1. St. Ignace--Railroad Pier

- The site is the former St. Ignace terminal for the CHIEF.
- Exhibit V-2 shows the precise location.
- There are 3.4 acres available for adjacent parking.
- The site is very visible in downtown St. Ignace.
- The terminal is owned by the Soo Line Railroad.
- The cost to prepare the site is estimated at $886,470. This includes:

  --Repairs to the pier, and leveling ramp (see Figure V-1)

  --New parking lot

  --Lighting

  --Four hundred and fifty (450) feet of fencing

  --Utility connections

  --Gangway

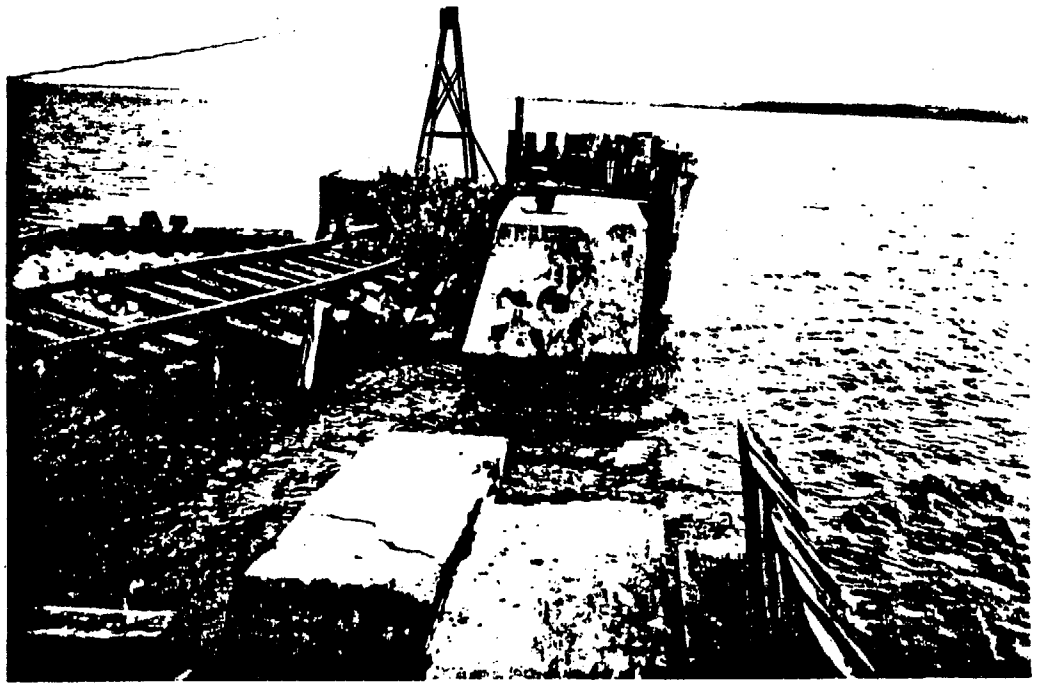
  --Restrooms aboard

  --Ticket booth/souvenir shop

- If a breakwater is necessary to provide protection against waves and ice movements, an additional cost of $440,000 will be needed, making the total $1,326,470.

Figure V-1

Deterioration of pier at St. Ignace Terminal (Site S-1).



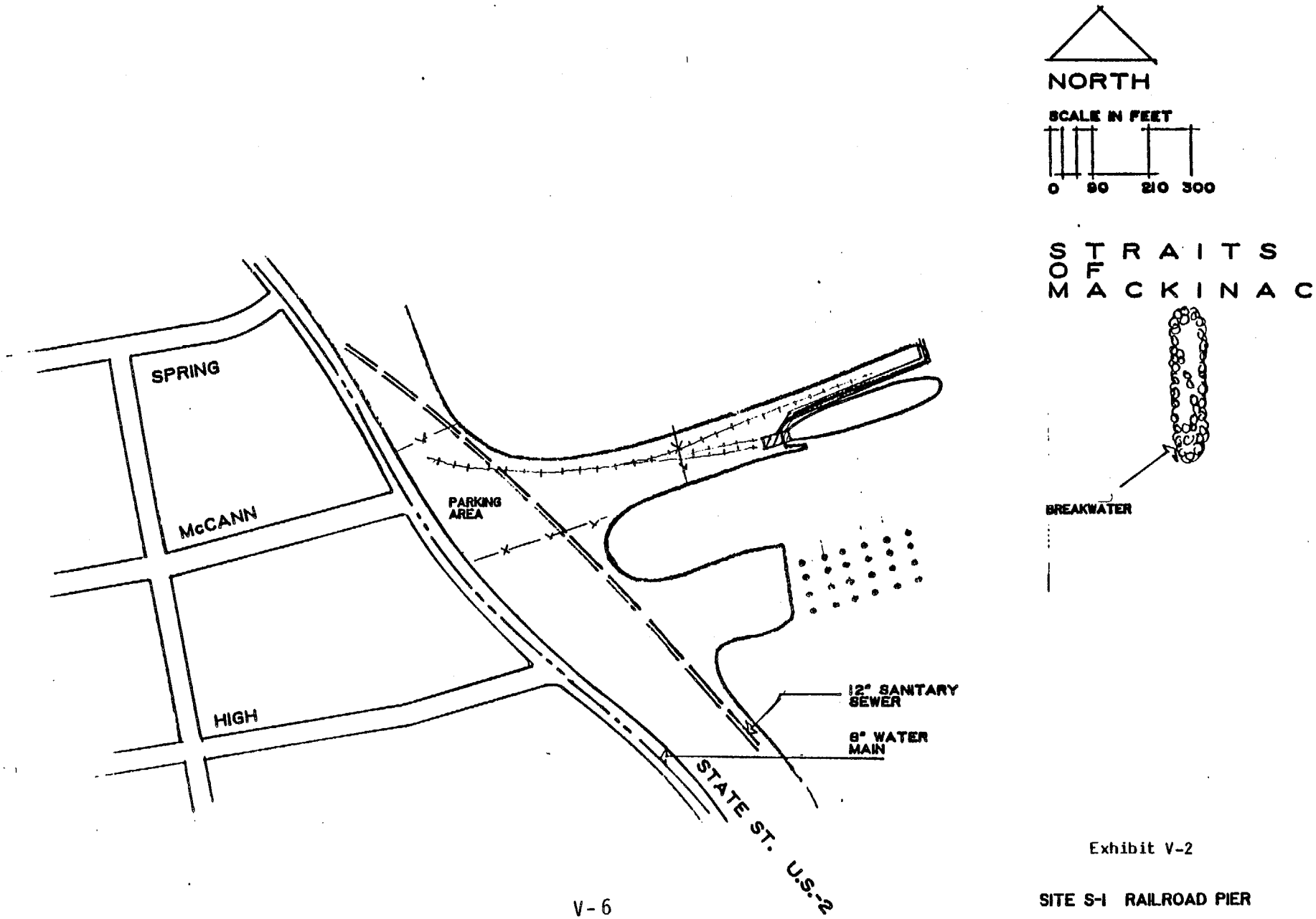


Exhibit V-2

SITE S-I RAILROAD PIER

S-2. St. Ignace--Merchandise Pier

- The site is the ruins of the former merchandise pier, which is just south of the Soo Line terminal site (see Figure V-2).
- Exhibit V-3 shows the location.
- The site is very visible in downtown St. Ignace.
- There are 3.8 acres available for adjacent parking.
- The land is owned by the City of St. Ignace.
- The cost to prepare the site is estimated at $1,379,000. This includes:

  --New pier, piling, and leveling ramp

  --New parking lot

  --Four hundred (400) feet of fencing

  --Lighting

  --Utility connections

  --One hundred (100) feet of rail track

  --Gangway

  --Restrooms aboard

  --Ticket booth/souvenir shop

- If a breakwater is needed, it will cost $440,000 for a total of $1,819,000.

Figure V-2

St. Ignace Merchandise Pier (Site S-2).

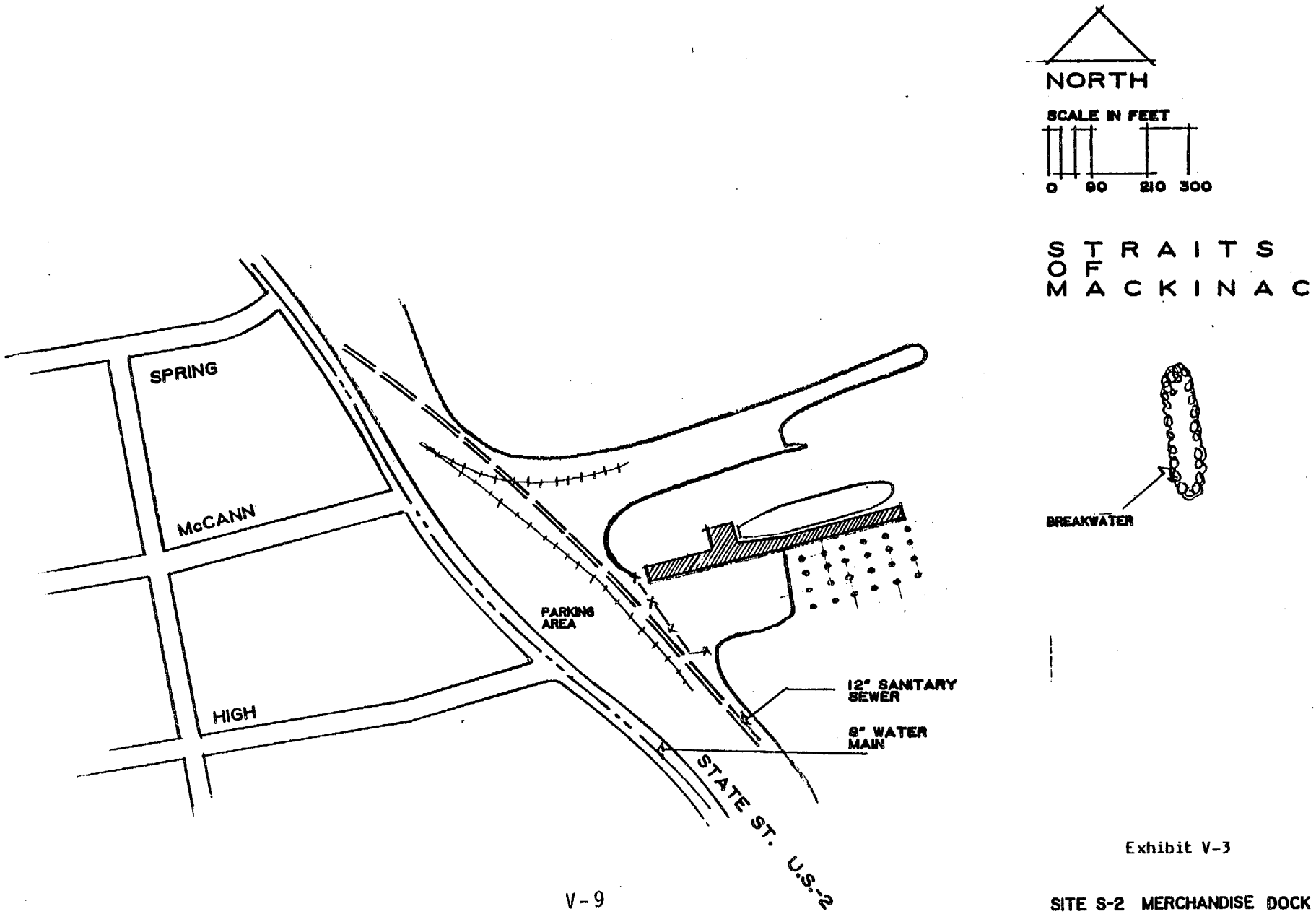


Exhibit V-3

SITE S-2 MERCHANDISE DOCK

S-3. St. Ignace--State Car Ferry Pier

- The site is the State Car Ferry Pier next to the Coast Guard station (see Figure V-3).
- Exhibit V-4 shows the location.
- The site is not visible from either St. Ignace or from the Mackinac Bridge.
- There are 5.7 acres available for adjacent parking.
- The land is owned by the City of St. Ignace.
- The cost to prepare the site is estimated at $599,200. This includes:

  --Minor pier alterations

  --New piling and leveling ramp

  --New parking lot

  --Three hundred (300) feet of fencing

  --Lighting

  --Utility connections

  --One hundred (100) feet of rail track

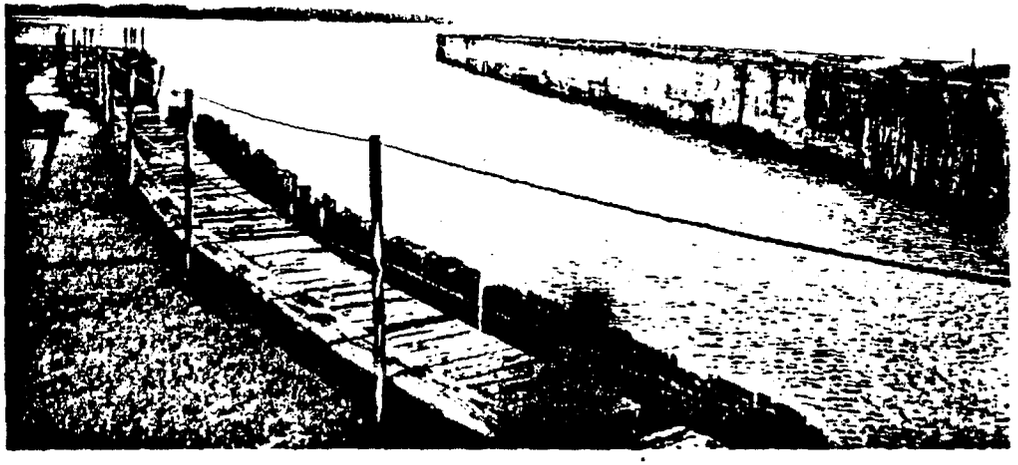
  --Gangway

  --Restrooms aboard

  --Ticket booth/souvenir shop
- If a breakwater is needed, it will cost $900,000 for a total of $1,499,200.

Figure V-3

St. Ignace State Car Ferry Pier (Site S-3).



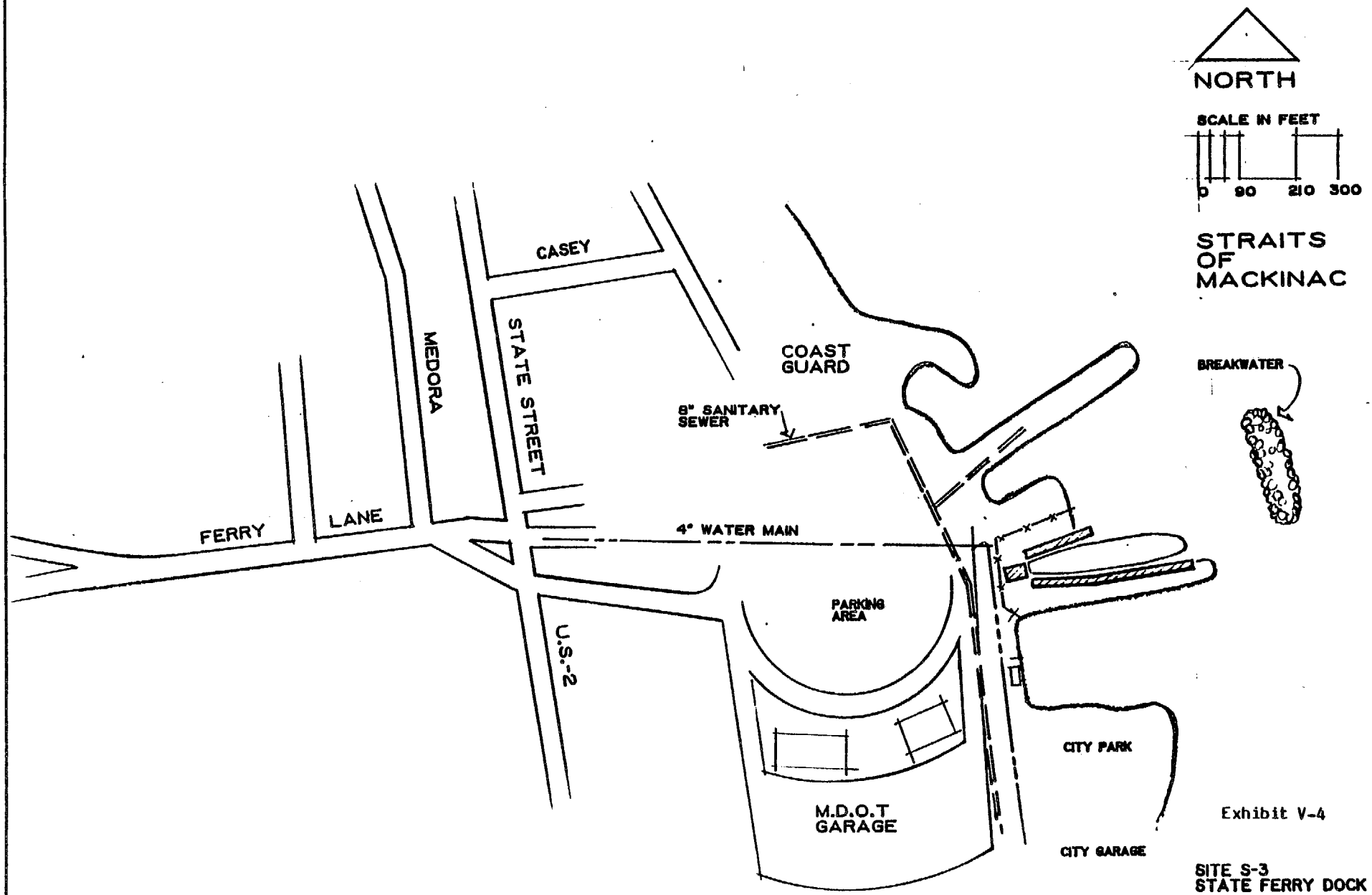


Exhibit V-4

SITE S-3
STATE FERRY DOCK

S-4. St. Ignace--Northwest Oil Terminal

- The site is on the north side of St. Ignace harbor (see Figure V-4).
- Exhibit V-5 shows the location.
- The site is very visible from downtown St. Ignace.
- The land is owned by W.R. Grace & Co., which is currently looking for a buyer.
- The cost to prepare the site is estimated at $1,911,000. This includes:

  --New pier, piling, and leveling ramp construction

  --Extensive dredging

  --New parking lot

  --One thousand six hundred (1,600) feet of fencing

  --Lighting

  --Utility connections

  --One hundred (100) feet of rail track

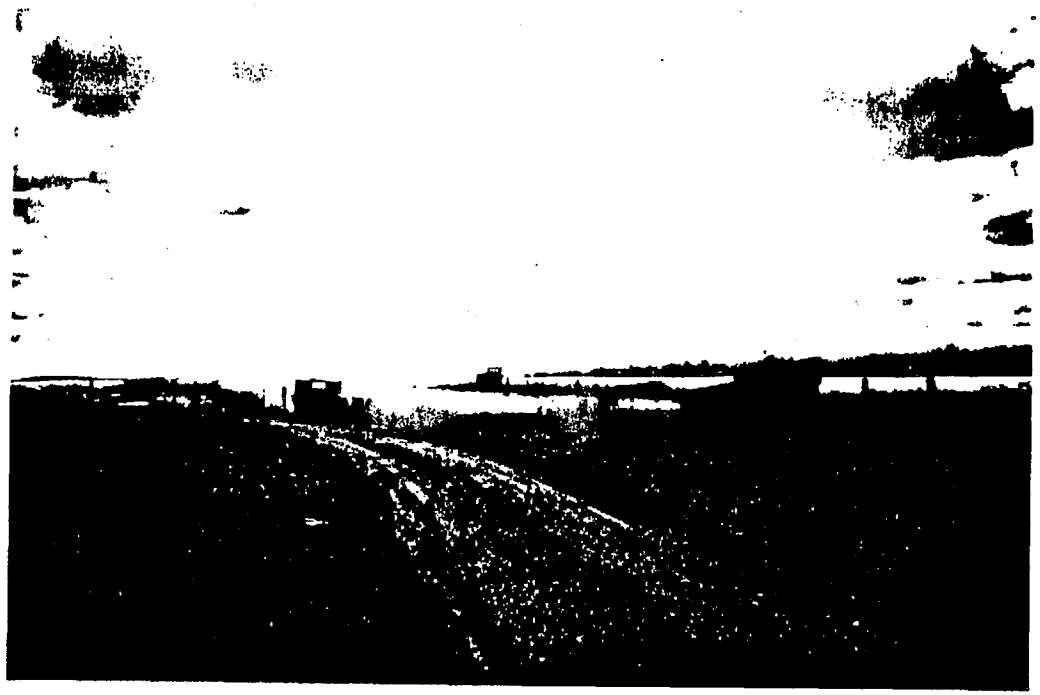
  --Gangway

  --Restrooms aboard

  --Ticket booth/souvenir shop
- If an offshore breakwater is required, it will cost $1,100,000 for a total cost of $3,011,000.

Figure V-4

St. Ignace Northwest Oil Terminal (Site S-4).



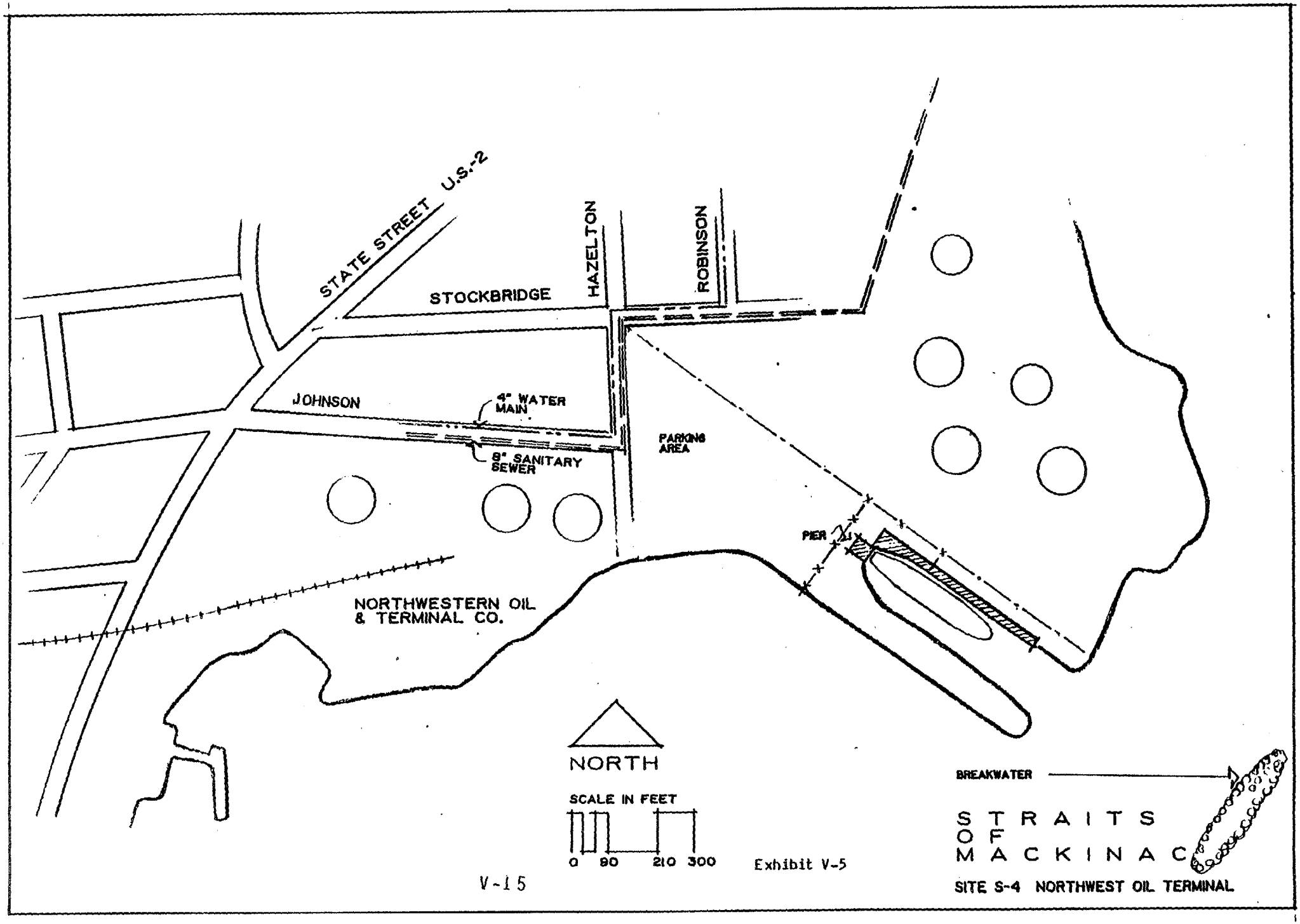

STATE STREET U.S.-2
STOCKBRIDGE
HAZELTON
ROBINSON
JOHNSON
4" WATER MAIN
8" SANITARY SEWER
PARKING AREA
PIER
NORTHWESTERN OIL & TERMINAL CO.
NORTH
SCALE IN FEET
0 90 210 300
BREAKWATER
STRAITS OF MACKINAC
SITE S-4 NORTHWEST OIL TERMINAL

Exhibit V-5

S-5. St. Ignace--West Side of Straits Bridge

- The site is the north end of the bridge to the west of the bridge approach.
- Exhibit V-6 shows the location.
- The site is very visible to northbound traffic on the Mackinac Bridge.
- There are 9.6 acres available for adjacent parking.
- The land is owned by the City of St. Ignace.
- The cost to prepare the site is estimated to be $1,991,950. This includes:

  --New pier, piling, and leveling ramp

  --Extensive dredging

  --New parking lot

  --Six hundred (600) feet of fencing

  --Lighting

  --Utility connections

  --One hundred (100) feet of rail track

  --Gangway

  --Restrooms aboard

  --Ticket booth/souvenir shop

- It is highly likely that an offshore breakwater will be required. It will cost $630,000, for a total of $2,621,950.

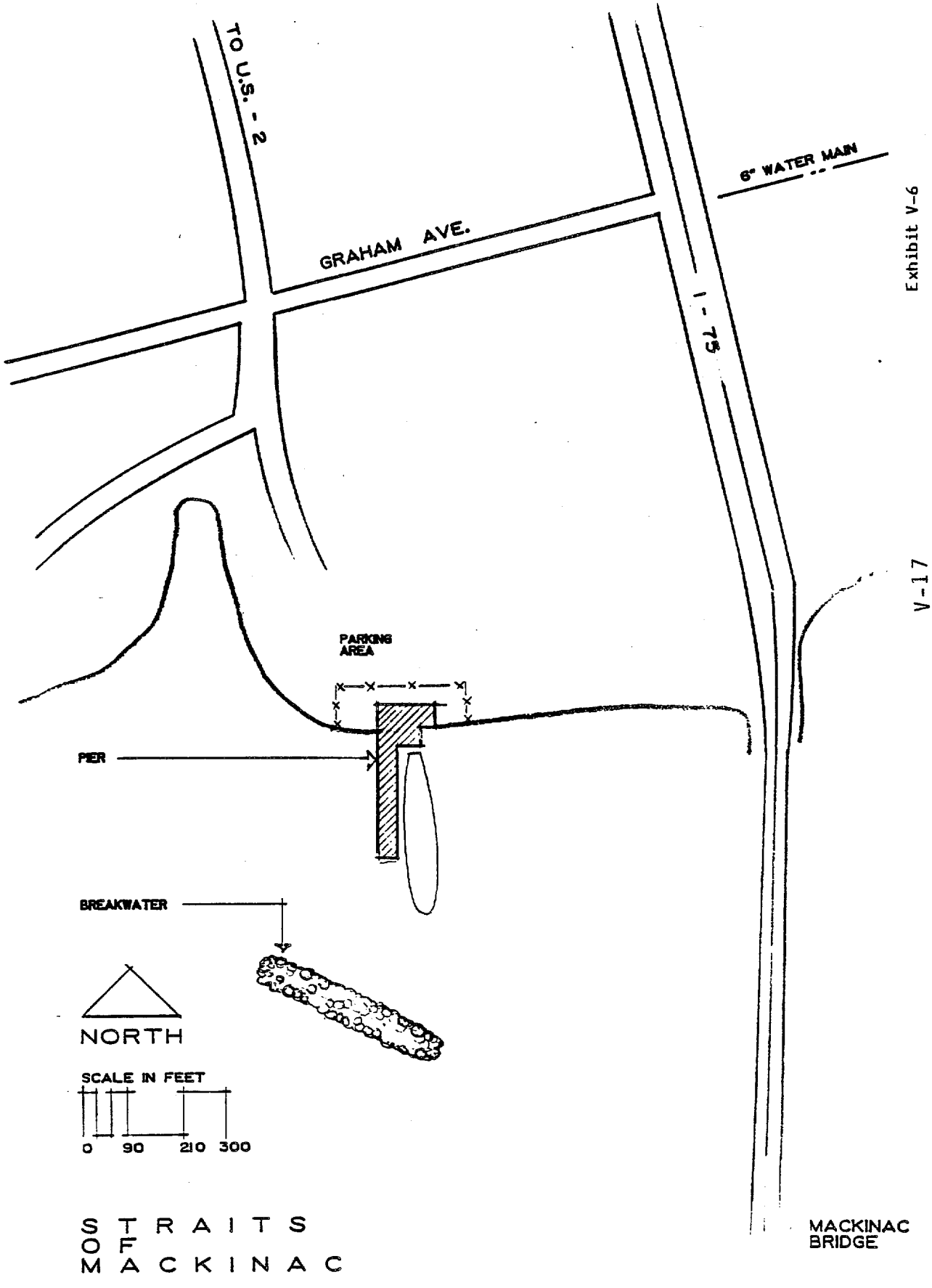


Exhibit V-6

SITE S-5 WEST SIDE OF MACKINAC BRIDGE

M-1. Mackinaw City--Railroad Pier

- The site is the former Mackinaw City terminal for the CHIEF, where she is currently moored (see Figure V-5).
- Exhibit V-7 shows the location.
- The site is very visible from downtown Mackinaw City and from the southbound lanes on the Mackinac Bridge.
- There are 2.5 acres across Huron Avenue for parking.
- The terminal is owned by the Detroit and Mackinac Railroad.
- The D&M is willing to negotiate a lease.
- The cost to prepare the site is estimated at $807,850. This includes:

  --Repair to the pier and leveling ramp

  --New parking lot

  --Three hundred (300) feet of fencing

  --Lighting

  --Utility connections

  --One hundred (100) feet of rail track

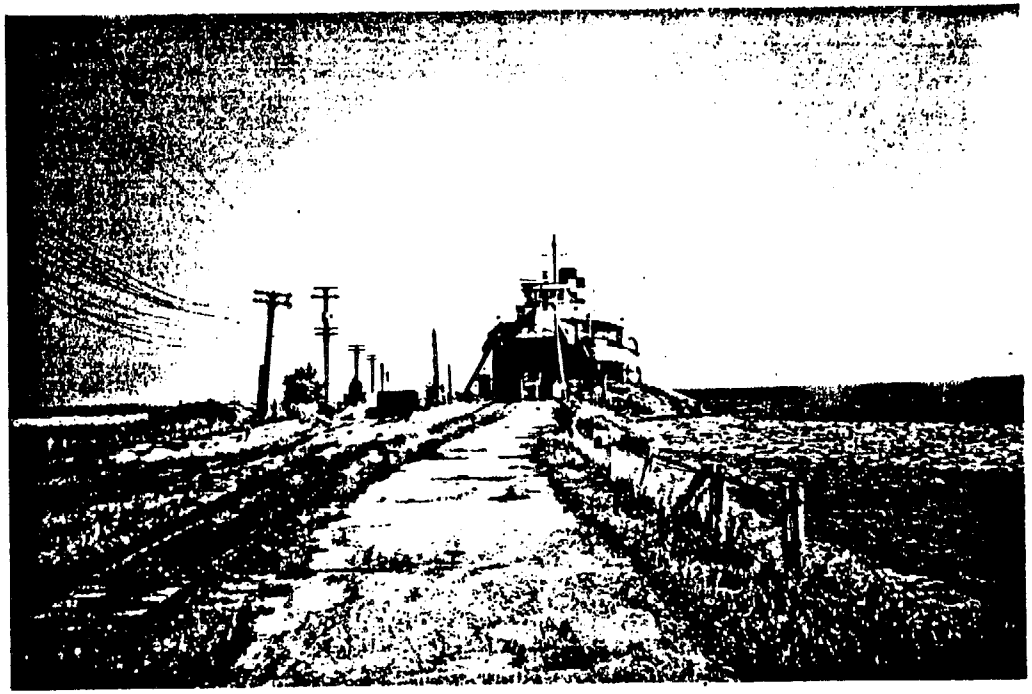
  --Gangway

  --Restrooms aboard

  --Ticket booth/souvenir shop
- If a breakwater is required, it will cost $1,200,000 for a total cost of $2,007,850.

Figure V-5

Track and approach to Mackinaw City Terminal (Site M-1).



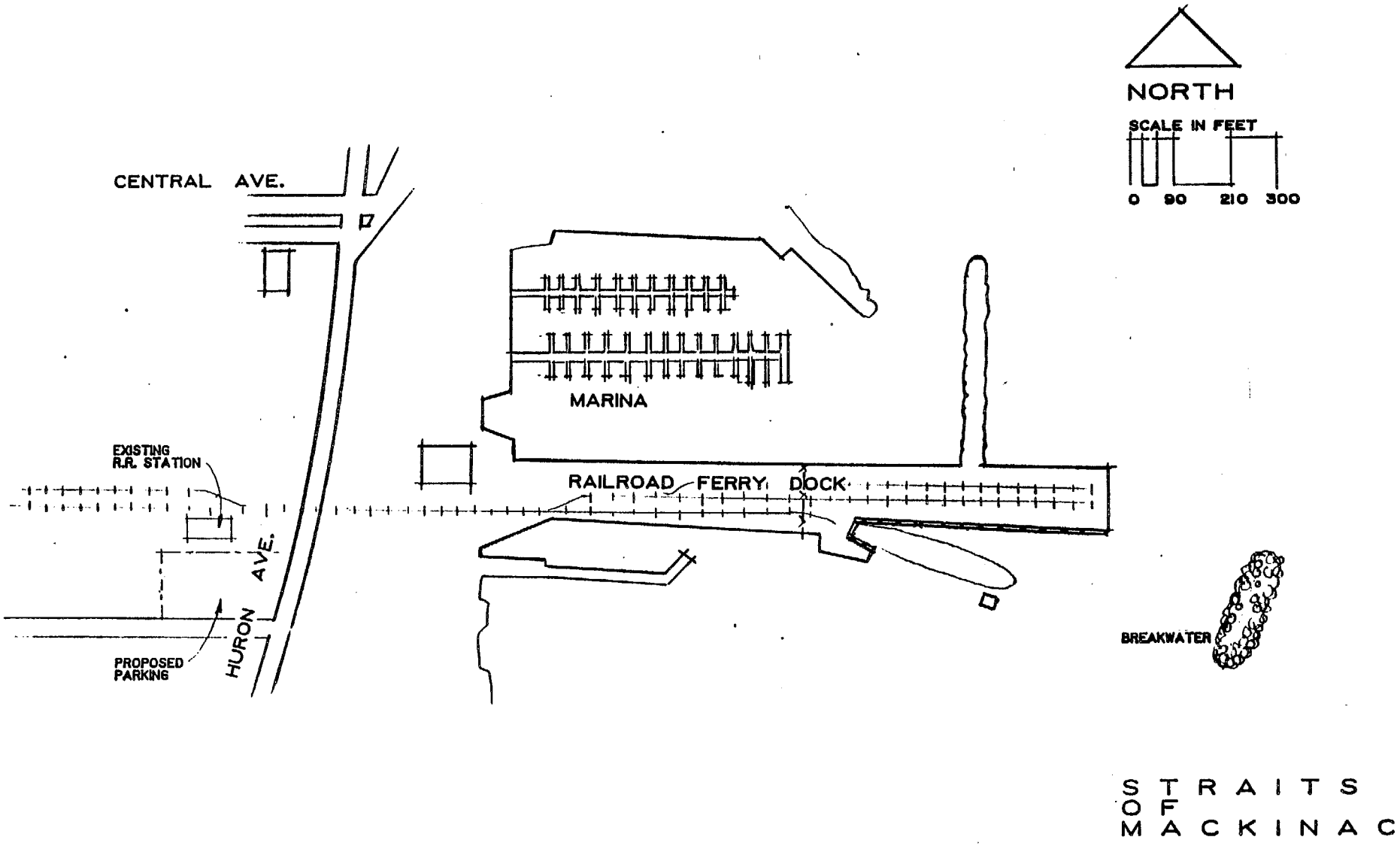


Exhibit V-7

SITE M-I RAILROAD PIER

M-2. Mackinaw City--State Car Ferry Pier

- The site is the south side of the State Car Ferry Pier in Mackinaw City (see Figure V-6).
- Exhibit V-8 shows the location.
- The site is very visible from downtown Mackinaw City and from the southbound lanes of the Mackinac Bridge.
- Parking is available on the pier.
- The pier is owned by the State of Michigan.
- The cost to prepare the site is estimated at $893,500. This includes:

  --Extensive pier repair

  --New leveling ramp

  --Six hundred (600) feet of fencing

  --Lighting

  --Utility connections

  --One hundred (100) feet of rail track

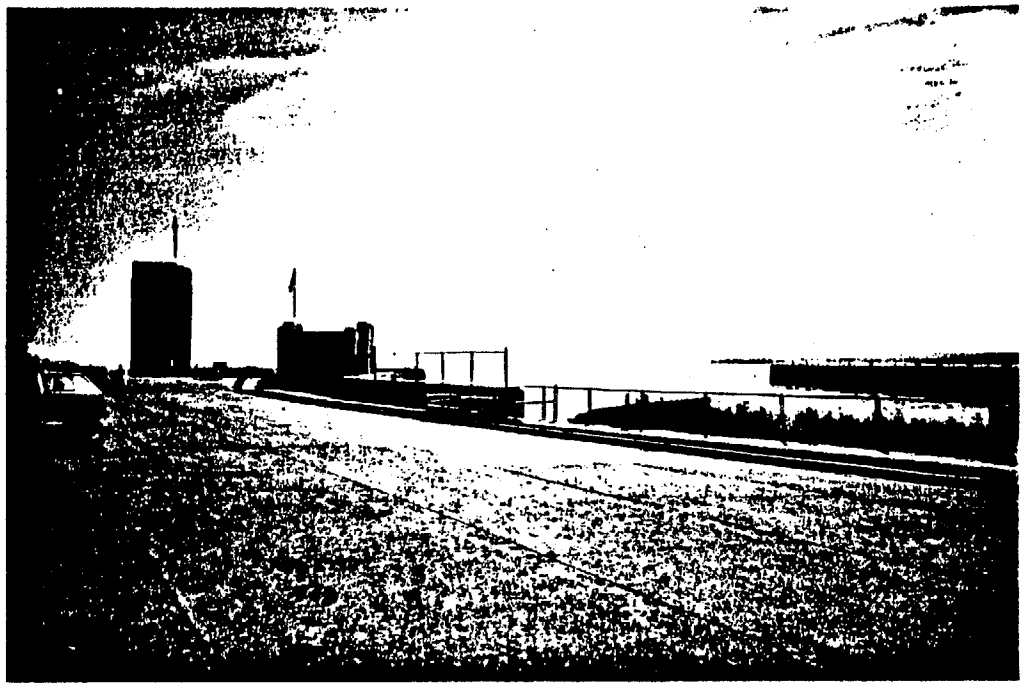
  --Gangway

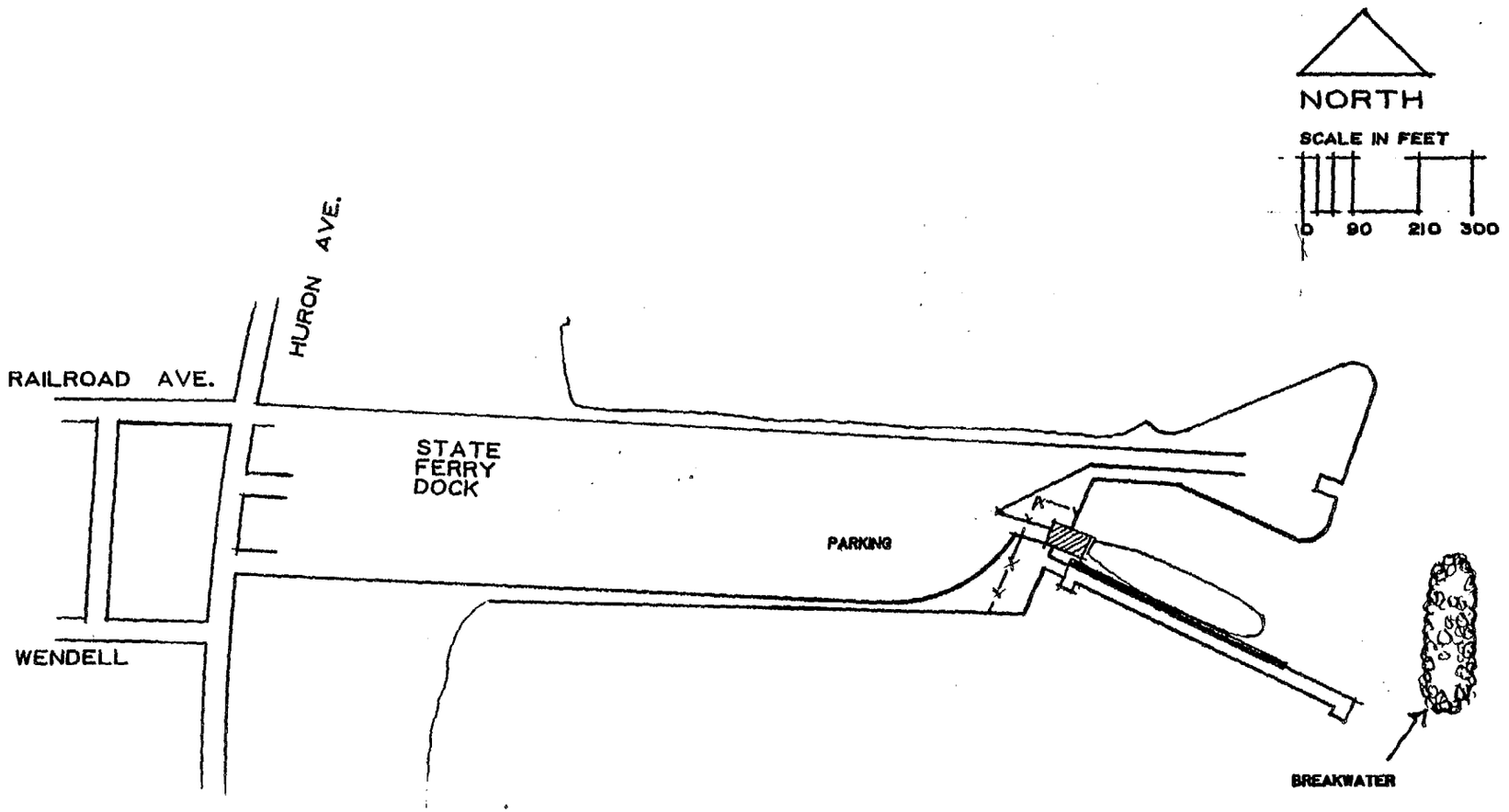
  --Restrooms aboard

  --Ticket booth/souvenir shop
- If a breakwater is required, it will cost $750,000 for a total of $1,643,500.

Figure V-6

Facing east at Mackinaw City State Car Ferry Pier, Site M-2 would be on the north side of the south pier (at the right of the photograph).





STRAITS
OF
MACKINAC

Exhibit V-8

SITE M-2 STATE FERRY DOCK

M-3. Mackinaw City--Ferry Pier Breakwater

- The site is the north side of the State Car Ferry Pier. Lying in a north/south direction, the CHIEF would be grounded in position as a breakwater (see Figure V-7).
- Exhibit V-9 shows the location.
- The site is very visible from downtown Mackinaw City and from the southbound lanes of the Mackinac Bridge.
- Parking is available on the pier.
- The pier is owned by the State of Michigan.
- The cost to prepare the site is $753,400. This includes:

  --Pier addition

  --Moderate dredging

  --Four hundred fifty (450) feet of fencing

  --Lighting

  --Utility connections

  --Gangway

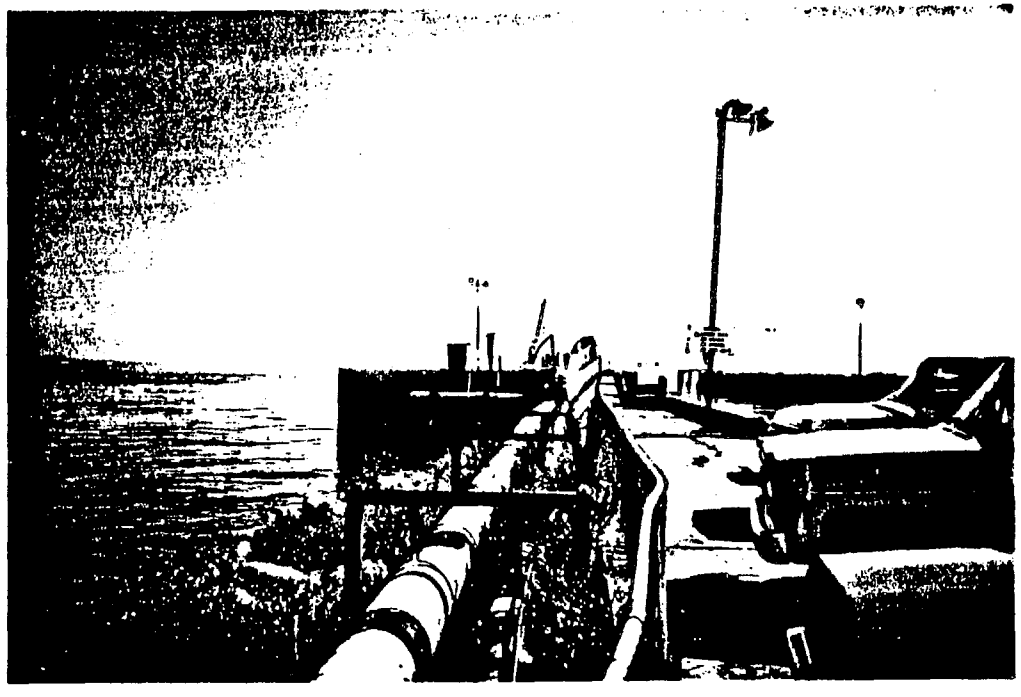
  --Restrooms aboard

  --Ticket booth/souvenir shop

  --Rip rap and fill for breakwater
- No additional offshore breakwater is required.

Figure V-7

The Mackinaw City Ferry Pier Breakwater (Site M-3) would extend to the left of the photograph, with the CHIEF's bow toward the side of the pipeline.



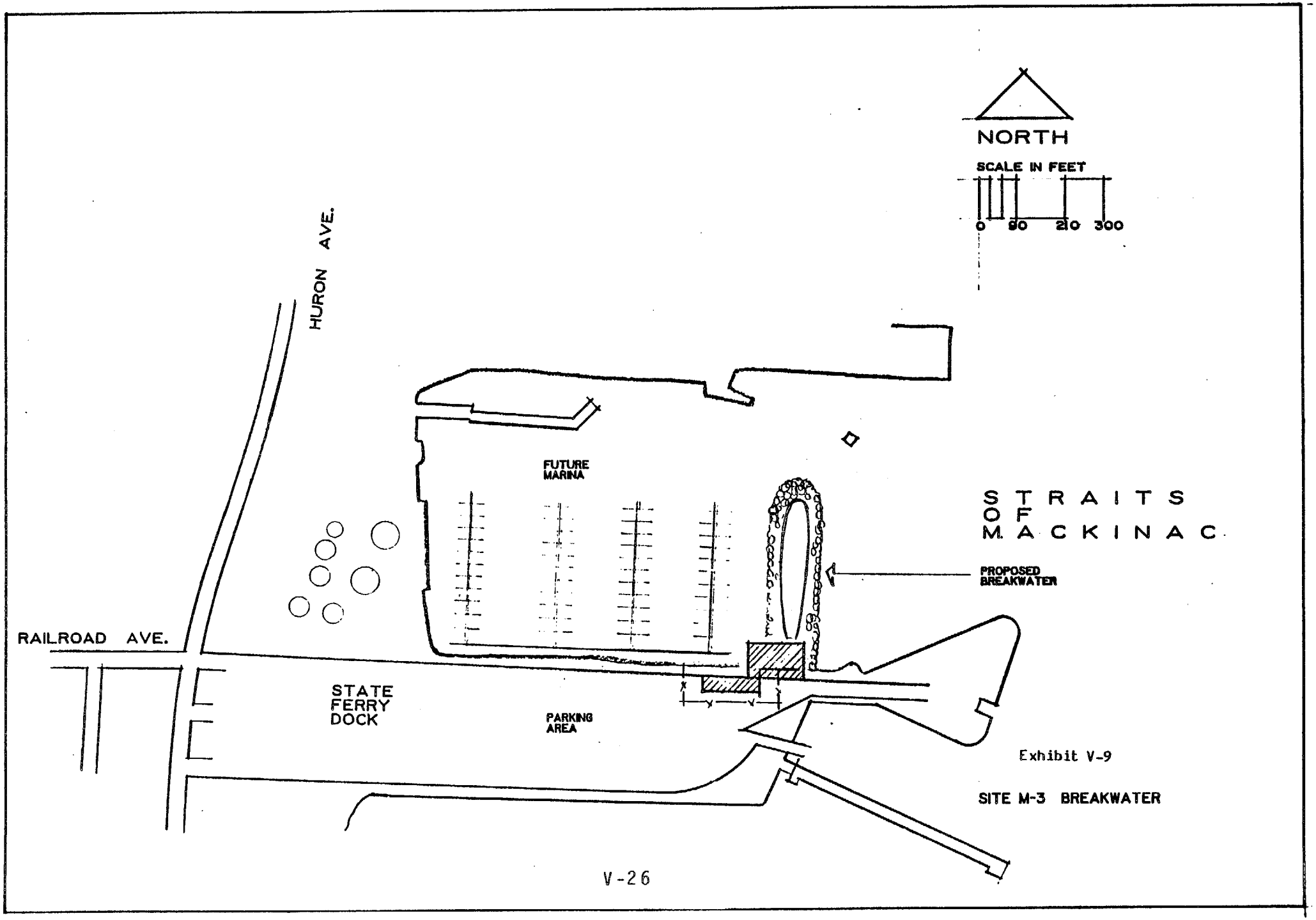


Exhibit V-9

SITE M-3 BREAKWATER

VI. REGULATORY CONSTRAINTS

- Any plans for use of the CHIEF would have to comply with regulatory requirements imposed by federal, state, and local agencies to protect people, property, and the environment. The following sections of this chapter review regulations relevant to the alternatives discussed in this report.

U.S. COAST GUARD

- The Coast Guard relinquishes jurisdiction over floating vessels that are used for other (nonmaritime) purposes when they are permanently moored and thus taken out of navigation. The CHIEF would be called "substantially a land structure" and would not be subject to inspections laws. It still must comply with environmental protection laws. To qualify as substantially a land structure:

  --The CHIEF must be securely and substantially moored as approved by the Officer in Charge of Marine Investigation (OCMI).

  --The mooring must be rigged so that the lines cannot be inadvertently or accidentally cast off; the structure is unlikely to break away from its moorings; and it cannot be moved from the pier without special efforts such as the use of tools.

  --The CHIEF must have permanent connection to a shoreside facility.

- The Coast Guard will allow the chief to be placed in navigation periodically and still retain its status as "substantially a land structure" when moored. This will permit towing the CHIEF to a shipyard for drydocking and repairs.

- The OCMI notifies the appropriate local authorities when the vessel is taken out of navigation so that appropriate local safety codes may be applied.

U.S. ARMY CORPS OF ENGINEERS

- The Corps of Engineers has responsibility to regulate obstructions or alterations of navigable waters of the United States and the discharge and transportation of dredge spoil. In the event that a site that requires dredging is chosen, the CHIEF will need permits so that it can be placed in its permanent mooring and so that new piles can be built. Federal permits are issued in cooperation with the Michigan Department of Natural Resources.

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

- In addition to regulating new mooring structures and the discharge and transportation of dredge spoil, MDNR has the responsibility of protecting public bottom lands in state waters. Any dredging project in these waters would require a permit pursuant to the Submerged Land Act of 1955 (P.A. 247) as amended. In particular, placing the CHIEF on or over state-owned Great Lakes bottom land as a permanently moored vessel or as a breakwater would require investigation and supporting material to gain approval from MDNR.

Regulatory Constraints

--Structural limitations

--Site limitations

--Economic limitations

--Technological limitations

--Jurisdictional conflicts

--Historical structures

VII. FINANCIAL PARTICIPATION

BACKGROUND

- The most appropriate way to preserve the CHIEF as a historical structure is as a museum, because it minimizes change to the vessel and emphasizes preservation.

- There should be no false expectations that the vessel will pay for itself easily as a museum. Admission may defray a large part of the museum operating expenses, but the ship is a large, complex structure in need of much maintenance. The five-month tourist season is short. It is difficult to envision the ship being well maintained without subsidy or endowment.

- Many maritime museums attempt to run in the black as a business, but even if they succeed on paper, the vessels are usually found to be steadily corroding away due to lack of major maintenance.

- The order of magnitude of the project requires vision by the larger communities of the state and the nation to see the CHIEF's place in the region and its national historical significance. The vessel is an extremely valuable artifact. It would be a great tragedy to lose it for want of appreciation or vision by the public beyond the local area.

SOURCES OF FUNDS

- The CHIEF will definitely require sources of funding beyond expected revenues from admissions and souvenirs and any leases from shops or a restaurant. One potential source is from contributions through the dues structure of a Maritime Society.

- The two major sources of outside funding would be private endowments and government subsidies.

Private Fund Raising and Endowments

- Private funds can be raised for maritime museums but require a carefully organized group of local, regional, and national participants. Some professional assistance in organizing the campaign will be useful. The campaign should be designed for a two- to three-year period to raise the initial money necessary to stabilize the vessel and prepare it as a museum. Ideally, the fund raising should go beyond the startup requirements in order to build an endowment that will generate income in future years to supplement admissions and other use-related sources.

- Generally, it takes one principal charitable organization to recognize the value of a project before that information is transmitted to other organizations that will respond to requests for funding. It is important that the fund-raising organization be as broad-based as possible and include people and organizations with a variety of interests such as historical, Great Lakes, maritime industry, railroads, Michigan, industries that used the railcar ferry service, Mid-West, Canadian, and other interests that are connected to the CHIEF.

- During the course of this study, contact was made with people who are involved in requesting charitable funds and dispensing those funds. It was clear that the best approach to obtain major funding is a well-formed group that has a carefully organized plan and that uses business techniques to describe its intentions, expectations, and chances for success.

Government Subsidies

- The local governments may provide limited funds. In its 1986 budget, the Village of Mackinaw City appropriated $25,000 for use on the CHIEF. The state, through the Mackinaw Island State Park Commission, may be a source of start-up funds if the Commission decides that the CHIEF will support its mission. The Commission is generally willing to support a project if there is a fair expectation that it could break even after a reasonable start-up period. Potential for other state funds was not identified.

Local Private Sources

- There were few indications of local private financial support for the CHIEF. The Mackinaw County Economic Development Corporation of St. Ignace expressed a willingness to support promotions and advertising for the CHIEF, in keeping with the organization's mission. Conversations with major local passenger ferry operators did not develop any apparent sources of funding.

Volunteers and Donations in Kind

- Many costs could be saved in restoration and maintenance of the CHIEF through the use of volunteer time. This would require a program to solicit volunteers, develop projects, establish schedules, and maintain enthusiasm. Donations of furnishings, spare parts, railcars, and other relevant materials can significantly reduce the need for cash donations.

Appendix A

COST ANALYSIS

This appendix displays the costs of alternative uses and sites for the CHIEF. Costs are shown for the best use and next two best uses. Costs for the eight sites are then shown.

COST OF BEST USE

The cost of preparing the CHIEF for its best use as a permanently moored museum includes the cost of stabilization of existing deterioration, minimum restoration and museum preparation, full museum restoration, shore site preparation, permanent moorings, towing, and annual maintenance and operating expenses.

Initial Vessel Stabilization ($310,000 total)

The following items are initially required to arrest decay, deterioration, and corrosion of the hull and superstructure:

- Internal Hull: Flush peak tanks and double bottom with a preservative coating to arrest further corrosion for three to five years ($40,000).

- External Hull:

  --Install cathodic protection system to prevent pitting and other external corrosion of hull ($30,000).

  --Upgrade moorings to provide spring and shock absorption with chain or nylon and cable mooring lines ($25,000).

- Superstructure: To arrest further rot and prevent water infiltration, design and build plastic-covered wood frame for the superstructure ($215,000). See Figure A-1, which shows one example of the deterioration of the wood structure.

Deterioration of the wooden superstructure on the weather deck.

Minimum Restoration and Museum Preparation ($235,000--total)

The following items are required to prepare the CHIEF for initial operation as a maritime museum:

- Self-Guided Visitation Tour: Plan and lay out a self-guided tour route through the rail deck, Texas deck, pilot house, boiler rooms, and engine rooms ($30,000).

- Displays: Construct interpretive displays for exhibit areas ($25,000).

- Ship Alterations: Make the following additions and alterations throughout display spaces:

  --Handrails ($15,000)

  --Lighting ($20,000)

  --Asbestos insulation sealing ($5,000)

  --Rail deck planking ($15,000)

  --Non-skid decking ($15,000)

- Brochures: Plan and print brochures and advertising ($10,000)

- Furniture and Fixtures: Purchase fixtures for berthing and galley spaces ($100,000).

- Superstructure: Maintenance of wheel house, Texas dock, and other interior spaces ($5,000).

- General Janitorial: Cleaning of interior spaces ($5,000).

- Electricity: ($5,000)

- Water and Sewer: ($5,000)

- Trash Removal: ($2,000)

Annual Dockside Maintenance Expenses ($10,000--total)

Maintenance and repairs of dockside facilities: parking lot gangway, ticket booth, pier and leveling ramp will be $10,000 annually.

Annual Museum Management Expenses ($127,000--total)

The following items are annual expenses necessary to operate and manage the museum:

- Permanent Staff:

  --Museum Director ($25,000)

  --Site and Ship Manager ($20,000)

  --Secretary ($15,000)

  --Overhead on personnel at 33 percent ($20,000)

- Seasonal Staff:

  --Two ticket sellers and two maintenance people at $4.00 per hour for 84 hours per week for five months plus overhead ($27,000).

- Advertising and Promotional: ($10,000)

- User Program Development: ($10,000)

Full Restoration and Museum Development ($1,425,000--total)

The following items will complete the restoration and development of the CHIEF as a national class maritime museum:

- Restoration of Living Quarters: Complete restoration ($750,000).

- Restoration of Pilot House and Texas Deck: Complete restoration ($75,000).

- Expanded Visitor Interpretation: Complete interpretation throughout visitor spaces ($50,000).

- On-Board Rail Cars: Acquisition and securing typical rail cars ($100,000).

- Main Engine Exhibit: Engine room viewing gallery with running engine and full sound program ($300,000).

- Auxiliary Engine Exhibit: Auxiliary machinery driven by compressed air ($50,000).

- Boiler Room Exhibit: Operating boiler ($100,000).

COSTS OF NEXT BEST USES

The costs of preparing and operating the CHIEF for the two next best uses of museum with shops and museum with restaurant are shown below.

Conversion of Staterooms to Shops ($218,000--total)

To convert the upperdeck area to shop space would require combining two or three staterooms into a 250 square foot shop. These costs do not include shopowner expenses for storage, shelving, and display costs. Conversion costs for the CHIEF are:

- Carpentry, doors, locks, paint, floor covering ($80,000)

- Lighting and receptacles ($35,000)

- Heating/ventilation/air conditioning system ($55,000)

- Sprinkler system ($30,000)

- Security system--intrusion and fire ($18,000)

Shops in Boxcars ($97,000--total)

An alternative arrangement for shops would be in boxcars installed on the rail deck. Costs would be:

- Car acquisition, haulage, and installation of four cars at $6,000 each ($24,000)
- Carpentry and alterations ($16,000)
- Apron, handrails, and ramps for entry and egress ($5,000)
- Electrical system ($16,000)
- Heating/ventilation/air conditioning system ($22,000)
- Sprinkler system ($8,000)
- Security system ($6,000)

Annual Costs of Shops ($17,000)

Utility and maintenance costs will include:

- Electricity for illumination, heating, ventilation, air conditioning, and hot water ($10,000)

- Trash removal and janitorial service ($2,000)

- General maintenance for added facilities ($5,000)

Restaurant in Rail Dining Cars with Kitchen ($277,000)

To use rail dining cars for complete restaurant service, a kitchen will have to be constructed on the rail deck and outfitted, or the ship's galley re-outfitted and arrangements made for delivering meals from the upper deck to the rail deck. Costs are:

- Acquisition, haulage, and installation of three dining cars at $30,000 each ($90,000).

- Refurbishing cars at $20,000 each ($60,000).

- Kitchen construction--1,000 square feet ($30,000).

- Electrical system ($15,000).

- Heating/ventilation/air conditioning system and vent hoods ($12,000).

- Plumbing ($6,000).

- Sprinkler system ($6,000).

- Kitchen outfitting for cooking, preparation, service, and washing ($38,000).

- Refrigerated storage, 200 square feet at $100 per foot ($20,000).

Snack Bar in Dining Cars ($150,000)

Dining cars could be used as snack bars with reduced conversion costs as follows:

- Acquisition, haulage, and installation ($90,000)

- Refurbishing cars ($60,000)

Annual Costs of Restaurant With Kitchen ($31,000)

Utility and maintenance costs will include:

- Electricity for illumination, heating, ventilation, air conditioning, and hot water ($15,000)

- Trash removal and janitorial service ($6,000)

- General maintenance for added facilities ($10,000)

COSTS OF SITE PREPARATION

The costs of preparing each of the eight sites are described below within the categories of pier construction or repair, leveling ramp for loading construction or repair, parking lot filling/grading/paving, dredging, fencing, electrical service, lighting, water service, sewer, rail track, piling, gangway construction, restrooms, and ticket booth/souvenir shop. In addition, the cost of breakwater construction is estimated in the event that the mooring facilities need additional protection from wave and ice action. DNR doubts if offshore breakwaters will be necessary except for S-5 which is in an exposed location and for M-3 which has a breakwater as part of its design.

BASIS FOR COSTS

The costs for each site are:

S-1. St. Ignace Railroad Pier

- Major repairs to pier structure and concrete cap and removal of submerged obstructions ($400,000)

- A-frame ship-loading leveling ramp repairs ($65,000)

- New parking lot

  --Fill ($25,170)

  --Grading ($7,400)

  --Paving ($180,000)

- 200 feet of fencing ($2,400)
- New electric service ($18,000)
- Lighting of vessel exterior, display signage, and parking lot ($19,500)
- Water service requires 700 feet of pipe with a flexible connector and a back pressure regulator ($20,500)
- Sewer extension of 600 feet with force main and a lift station or ejector pump ($25,500)
- Additional piling ($16,000)
- New gangway ($18,500)
- Restrooms constructed on raildeck ($58,500)
- Combination ticket booth and souvenir shop ($30,000)
- Offshore breakwater ($440,000)
- Total Cost: $886,470 without breakwater and $1,326,470 with.

S-2. St. Ignace Merchandise Pier

- New pier construction ($800,000)
- New leveling ramp ($150,000)
- New parking lot
  - --Fill ($28,130)
  - --Grading ($8,270)
  - --Paving ($180,000)
- 300 feet of fencing ($3,600)
- New electric service ($18,000)
- Lighting for vessel exterior, signage, and parking lot ($19,500)
- Water service requires 500 feet of pipe with a flexible connector and a back pressure regulator ($17,500)
- Sewer extension of 200 feet with force main and a lift station or ejector pump ($24,000)

- 100 feet of railroad track ($5,000)
- Additional piling ($18,000)
- New gangway ($18,500)
- Restrooms constructed on rail deck ($58,500)
- Combination ticket booth and souvenir shop ($30,000)
- Offshore breakwater ($440,000)
- Total Cost: $1,379,000 without breakwater and $1,819,000 with.

S-3: St. Ignace--State Car Ferry Pier

- Modified approach to pier ($32,000)
- New leveling ramp ($150,000)
- Surface for new parking lot ($210,000)
- 350 feet of fencing ($4,200)

- New electric service ($8,500)
- Lighting for vessel exterior, signage, and parking lot ($20,500)
- Water service requires 150 feet of pipe with flexible connector to the vessel ($11,500)
- Sewer extension of 150 feet with force main and lift station or ejector pump ($25,000)
- 100 feet of railroad track ($10,500)
- Additional piling ($20,000)
- New gangway ($18,500)
- Restrooms constructed on rail deck ($58,500)
- Combination ticket booth and souvenir shop ($30,000)
- Offshore breakwater ($900,000)
- Total Cost: $599,200 without breakwater and $1,499,200 with.

S-4. St. Ignace--Northwest Oil Terminal

- New pier construction ($750,000)
- New leveling ramp ($150,000)
- New parking lot
  --Fill ($40,700)
  --Grade ($12,000)
  --Pave ($210,000)
- Dredge docking area ($500,000)
- 575 feet of fencing ($6,900)
- New electric service ($17,000)
- Lighting for vessel exterior, signage, and parking lot ($27,500)
- Water service requires 800 feet of pipe with a flexible connector to the vessel ($20,400)

- Sewer extension of 800 feet with force main and a lift station or ejector pump ($35,000)
- 100 feet of railroad track ($10,500)
- Additional piling ($24,000)
- New gangway ($18,500)
- Restrooms construction on rail deck ($58,500)
- Ticket booth and souvenir shop ($30,000)
- Offshore breakwater ($1,100,,000)
- Total Cost: $1,911,000 without breakwater and $3,011,000 with.

S-5: St. Ignace--West Side of Straits Bridge

- New pier construction with pilings ($800,000)
- New leveling ramp ($150,000)

- New parking lot
  --Fill ($71,100)
  --Grade ($20,000)
  --Pave ($210,000)
- Dredge docking area ($533,600)
- 475 feet of fencing ($5,600)
- New electric service ($10,500)
- Lighting for vessel exterior, signage, and parking lot ($35,150)
- Water service from new well, tank, and appurtenances ($14,000)
- Sewer extension of 150 feet with a force main and a lift station or ejector pump ($25,000)
- 100 feet of railroad track ($10,000)
- New gangway ($18,500)

- Restrooms constructed on rail deck ($58,500)
- Ticket booth and souvenir shop ($30,000)
- Offshore breakwater ($630,000)
- Total Cost: $1,991,950 without breakwater and $2,621,950 with.

M-1: Mackinaw City--Railroad Pier

- Pier repairs ($200,000)
- New leveling ramp ($150,000)
- New parking lot
  --Fill ($18,500)
  --Grade ($5,450)
  --Pave ($200,000)
- 375 feet of fencing ($4,500)

- New electric service ($16,500)
- Lighting for vessel exterior, signage, and parking lot ($30,400)
- Water service requires 300 feet of pipe with flexible connector and back pressure regulator ($25,500)
- Sewer extension of 300 feet with a force main and a lift station or ejector pump ($35,000)
- Additional piling ($15,000)
- New gangway ($18,500)
- Restrooms construction rail deck ($58,500)
- Ticket booth and souvenir shop ($30,000)
- Offshore breakwater ($1,200,000)
- Total Cost: $807,850 without breakwater and $2,007,850 with.

M-2. Mackinaw City--State Car Ferry Pier

- Pier repairs ($500,000)
- New leveling ramp ($150,000)
- 375 feet of fencing ($4,500)
- New electric service ($10,000)
- Lighting for vessel exterior, signage, and parking lot ($39,000)
- Water service requires 1,500 feet of pipe with flexible connector with back pressure regulator ($25,500)
- Sewer extension of 1,500 feet with a force main and a lift station or ejector pump ($32,500)
- 100 feet of railroad track ($10,000)
- Piling ($15,000)
- New gangway ($18,500)

- Restrooms constructed on rail deck ($58,500)
- Ticket booth and souvenir shop ($30,000)
- Offshore breakwater ($750,000)
- Total Cost: $893,500 without breakwater and $1,643,500 with.

M-3. Mackinaw City--Ferry Pier Breakwater

- Pier addition ($72,250)
- Dredging to place the vessel ($62,000)
- 450 feet of fencing ($6,750)
- New electric service ($18,500)
- Lighting for vessel exterior, signage, and parking lot ($15,600)
- Water service requires 1,500 feet of pipe with flexible connector with back pressure regulator ($18,500)

- Sewer extension of 1,500 feet with a force main and a lift station or ejector pump ($32,800)
- New gangway ($18,500)
- Restrooms constructed on rail deck ($58,500)
- Ticket booth and souvenir shop ($30,000)
- Rip rap and fill around the CHIEF to form a breakwater ($420,000)
- Offshore breakwater ($420,000)
- Total Cost: $753,400 without offshore breakwater and $1,173,400 with.

SUMMARY OF COSTS

Exhibit A-1 is a list of all alternatives and a breakdown of all costs.

COST OF TOWING INTO POSITION

The cost of towing the CHIEF into position at the selected site will vary between $5,000 and $10,000 depending upon the time required due to the distance to be moved and the location of the tug's home port.

Exhibit A-1

COST ESTIMATES FOR SITE PREPARATION

	S-1 Railroad Pier	S-2 Merchandise Pier	S-3 State Car Ferry Pier	S-4 Northwest Oil Terminal	S-5 West Side of Mack. Bridge	M-1 Railroad Pier	M-2 South Side Ferry Pier	M-3 Ferry Pier Breakwater
a. Pier	$ 400,000	$ 800,000	$ 32,000	$ 750,000	$ 800,000	$ 200,000	$ 500,000	$ 72,250
b. Leveling ramp	65,000	150,000	150,000	150,000	150,000	150,000	150,000	0
c. Parking lot	212,570	216,400	210,000	262,700	301,100	223,950	0	0
d. Dredging	0	0	0	500,000	533,600	0	0	62,000
e. Fencing	2,400	3,600	4,200	6,900	5,600	4,500	4,500	6,750
f. Electric service	18,000	18,000	8,500	17,000	10,500	16,500	10,000	18,500
g. Lighting	19,500	19,500	20,500	27,500	35,150	30,400	39,000	15,600
h. Water service	20,500	17,500	11,500	20,400	14,000	25,500	25,500	18,500
i. Sewer	25,500	24,000	25,000	35,000	25,000	35,000	32,500	32,800
j. Railroad track	0	5,000	10,500	10,500	10,000	0	10,000	0
k. Piling	16,000	18,000	20,000	24,000	0	15,000	15,000	420,000[A]
l. Gangway	18,500	18,500	18,500	18,500	18,500	18,500	18,500	18,500
m. Restrooms	58,500	58,500	58,500	58,500	58,500	58,500	58,500	58,500
n. Ticket boot and souvenir shop	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000
Total	$ 886,470	$1,379,000	$ 599,200	$1,911,000	$1,991,950	$ 807,850	$ 893,500	$753,400
Breakwater (Optional)	440,000	440,000	900,000	1,100,000	630,000	1,200,000	750,000	N/A
Grand Total	$1,326,470	$1,819,000	$1,499,200	$3,011,000	$2,621,950	$2,807,850	$1,643,500	$753,400

[A] Includes cost of breakwater construction.