

Hessel Marina

Masterplan Update
June 2022





Hessel Marina Master Plan
June 30, 2022



HESSEL MARINA MASTER PLAN

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Prepared by:
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INTRODUCTION and PROJECT GOALS

The goal of this Master Plan is to assess the physical condition of Hessel Harbor, identify community goals, and prepare a concept redevelopment plan and cost estimates for the improvement of the facility. Specific objectives include:

- Facility and landside inspection, including recommendations for improvements and cost estimates for improvements
- Documentation of needs and trends in the local and regional market that will affect the future development, size, amenities, and configuration of the facility
- Incorporation of current design standards and codes, such as the ADA standards for Recreational Boating, current electrical shock drowning safety standards and electrical codes, and MDNR Harbor Development Standards Guidance
- Recommendations and cost estimates for future development
- Addressing potential acquisition of the Neal Residence to expand the marina

EXECUTIVE SUMMARY

Process

The process for completing this study involved significant outreach and interaction with Township staff, boaters, and residents of Hessel and Clark Township. The process began with completion of a detailed condition assessment of the physical facilities, followed by the development and refinement of a series of concept master plan alternatives that addressed the issues of concern raised by staff and the community. The stakeholder outreach process included a public meeting with local residents, and multiple work sessions with Clark Township staff. In addition to these efforts, the results of multiple surveys of operators and thousands of boaters across the state completed as part of the MDNR Statewide Facilities Assessment project provided valuable supporting data and context.

The information gathered was used to create three concept alternatives that resolved the issues identified in various ways, and these alternatives were reviewed with Township operational staff and the residents of the community. Based on that feedback, the preferred elements were incorporated into a single preferred Concept Master Plan that served as the basis for the cost, phasing, and financial assessments outlined herein.



Subsequent to the completion of the Hessel Marina Master Plan completed in June of 2021, the property immediately adjacent to the west of Hessel Marina known as the Neal Residence became available for sale. The Township decided to explore the possibility of acquiring the property to expand the marina, increase public waterfront, and implement a more cost-effective means of providing the necessary boater service facilities and other public uses.

The planning team explored a series of options to modify the overall marina master plan to utilize this additional waterfront and completed a thorough assessment of the existing structures and developed plans and program for the conversion of these structures to public uses. This supplemental study is incorporated into this document as the refined Concept Master Plan.

Condition Assessment

The process began with a thorough condition assessment and evaluation of all docks, facilities, and infrastructure. The harbor facilities include the existing fixed and floating docks, parking, boater services building, landside park amenities, and electrical and water utilities. The outer breakwater and shoreline armoring systems were included in this effort.

In general, most of the existing perimeter floating docks and utility infrastructure is aging, non-compliant with current accessibility and MDNR guidelines, and nearing the end of their useful design life. The interior floating dock system is newer and in better condition, however the utility systems are not compliant with current codes. The regular disconnection and/or removal of the floating dock and utility systems introduces additional wear and tear on these elements compared to facilities that remain in place year round. The fixed piers, sheet pile walls, and shoreline armoring systems are in need of a variety of improvements, however there are areas of settlement and damage from both ice and operational issues that need to be addressed. The site utility system is in need of a comprehensive overhaul, which will require significant reconstruction of many of the paved areas adjacent to the sheet pile walls. The boater services building is quite dated and has reached the end of its useful life.

Hessel Harbor was built in 1965. The harbor is formed by steel sheet pile walls with concrete perimeter walks that provide access to twelve slips on six floating finger piers and two sets of interior floating docks that support seventeen additional slips. Additional broadside mooring utilizing the sheet pile walls provides additional mooring capacity. Slip sizes range from 30' up to 50'.

Overall, marina docking structures are in fair to good condition for its age and can remain functional, however the utility systems are inadequate and do not meet current standards. Of particular concern is the condition and capacity of the electrical system, which is inadequate to meet the needs of the boaters during regular marina operations. The situation is significantly more challenging during the Les Cheneaux Islands Antique Wooden Boat Show, which is held each year on the docks of Hessel Marina. The floating docks are in good condition for their age, but similar to the perimeter docks, the electrical shore power system does not have ground fault protection. The marina utility systems should be



replaced as part of any future pier improvements project to achieve current compliance and reduce future maintenance requirements. The existing boater services building is functional but well past its useful life and lacks full ADA compliance. The building does not have any boater lounge facilities, and additional amenities like laundry are not to the standard generally found at similar MDNR harbor facilities.

Geography

Hessel Harbor is in a particularly good location for a facility of this type due to its proximity to the exceptional beauty of the Les Cheneaux Islands, as well as regional cruising routes between the North Channel and Mackinac Island. The facility is within easy walking distance to all the attractions of the community of Hessel. The facility is located at the end of South Pickford Avenue, and adjacent to the primary business district of the community of Hessel. A private restaurant is located nearly adjacent to the facility, in addition to the marine services offered at EJ Mertaugh Boat Works. This close relationship with downtown means that slips are located within a five-minute walk of shops, restaurants and other attractions, which is another primary draw for transient boaters. The facility also provides access to land for over 900 homes and cottages of the various islands, including regular commuter access and heavier commercial access for construction materials and other large items. Regionally, Hessel is located within an hour's drive of St. Ignace, Sault Ste. Marie, Drummond Island, and all of the tourist attractions of the eastern Upper Peninsula and much of the northern Lower Peninsula.



Conclusions – Occupancy and Demand

In summary, all of the available data provided by MDNR indicates very strong and growing transient demand that leaves the marina essentially fully occupied. While the 2020 boating season was exceptional in part due to Covid restrictions across the state in other areas, the increase in demand from 2017 to 2019 was very strong. This is remarkable especially since the facilities at Hessel are not up to current MDNR standards and offer far fewer amenities than would usually be expected at an MDNR or GIA facility. This data suggests that improving the existing facilities to offer power and water, and/or expanding the facility to provide more transient capacity would likely increase the use of this facility. Boat registration information suggests that the total number of boats in Michigan has remained stable since 2013, but consumer spending on new boats and accessories continues to increase.

In summary, Hessel Harbor is fortunate to be situated within some of the most beautiful cruising waters on the Great Lakes, and further benefits from the exceptional collection of historic wooden vessels and the associated cultural and educational facilities in the area. A series of targeted improvements to the aging facility would greatly improve the boater experience and reduce operational costs, and the expansion of a local commuter basin would improve access to Hessel from the islands and reduce operational congestion within the main marina basin.

Clark Township should consider the following strategies:

- Replace the aging boater services facilities
- Upgrade the utilities to modern standards, while addressing the dated and settling pavement.
- Improve community and boater gathering areas on dedicated areas on shore.
- Expand the number of slips within the marina basin where possible
- Create a new commuter marina basin for island residents on the west side of the facility, including a separate boat launch facility
- Improve vehicular parking and circulation
- Consider long term expansion of the seasonal and transient marina through a new outer basin
- Consider the acquisition of adjacent parcels where possible to improve community access to the waterfront

Concept Plan Alternative Process

A series of three initial concepts were prepared that were based on three primary approaches. Concept Alternative A suggested minor improvements to the main marina basin, and a new Courtesy Day Dock basin with access to the west. Concept Alternative B followed a similar approach with additional mooring, but provided access from the south. Concept Alternative C proposed a much more significant overhaul of the entire waterfront, with a much larger marina. These options were presented to the community during a public meeting, with the community indicating a preference for a revised plan that incorporated elements of all three initial concepts. The final consensus master plan incorporates the



preferred upland building location from Concept A with the general marina basin organization of Concept B, while allowing for the future expansion opportunities outlined in Concept C.

We recommend the following key strategies for the future development of Hessel Marina:

- Replace the existing boater services building and restroom facilities to meet modern standards, and consider the addition of a boater's lounge, dedicated laundry, and office facilities for marina staff
- Facilitate improved pedestrian connections between the marina and the Hessel community
- Improve the existing dock infrastructure to meet current ADA and MDNR guidelines for safety and functional usefulness
- Improve utility infrastructure and meet all new ESD codes
- Provide ADA compliant paddle craft access
- Pursue a phased implementation based on existing demand and expand in future phases as demand increases
- Expand the marina to include a new Courtesy Day Dock basin to improve access to the mainland for island residents, including a more functional boat launch for construction materials and large items
- Collaborate with the Village of Hessel and adjacent private businesses/landowners to consider modifications to the upland park areas around the waterfront to create a continuous public waterfront promenade and greatly expanded green space adjacent to the harbor
- Consider shared parking strategies that create dedicated marina parking near the waterfront, but not necessarily directly adjacent to the water, to reduce the amount of unnecessary pavement near the water's edge and greatly expand public green space
- Specific Program Elements include:
 - Improve Site Circulation
 - Improve Boater Services Building
 - Bring Utilities Up to MDNR Standards
 - Replace Floating Finger Docks
 - Maintain Water Depths
 - Increase Transient Day Docks
 - Improve Transient Loading
 - Expand Transient Mooring

FACILITY CONDITION ASSESSMENT

This condition assessment report is intended to describe the condition of the Hessel Harbor to help identify and prioritize improvements to the facility.



Harbor Condition Summary

Hessel Harbor was originally built in 1965, with finger piers added in the 1980s, new main pier and Fork Dock in the early 1990s, and additional finger piers in 2014. The harbor is formed by an outer steel sheet pile crib pier that extends from an earthen peninsula. Behind the outer pier, the edges of the harbor consist of a series of interior steel sheet pile walls. A two-lane boat launch facility is located in the northwest corner of the marina basin, and marina slips are provided through floating dock systems throughout. Along the interior of the fixed outer pier are eight 40' long slips and four slips at 48'. The interior floating docks provide fifteen slips ranging in length from 30' to 38', and the small "fork dock" along the northern edge provides four 24' slips. The outside wall of the outer fixed pier offers approximately 280 linear feet of broadside mooring, while additional broadside mooring occurs where possible within the marina basin.

Overall, marina docking structures are in fair to good condition, especially considering the age of the facility. While they remain functional, the utility systems are inadequate and do not meet current standards. Of particular concern is the condition and capacity of the electrical system, which is inadequate to meet the needs of the boaters during regular marina operations. The situation is significantly more challenging during the Les Cheneaux Islands Antique Wooden Boat Show, which is held each year on the docks of Hessel Marina. The floating docks are in good condition for their age, but similar to the perimeter docks, the electrical shore power system does not have ground fault protection. The marina utility systems should be replaced as part of any future pier improvements project to

achieve current compliance and reduce future maintenance requirements. The existing boater services building is functional but well past its useful life and lacks full ADA compliance. The building does not have any boater lounge facilities, and additional amenities like laundry are not to the standard generally found at similar MDNR harbor facilities. Field inspections of Hessel Harbor were completed by Edgewater Resources on multiple occasions during 2020.

Main Fixed Pier and Basin Walls

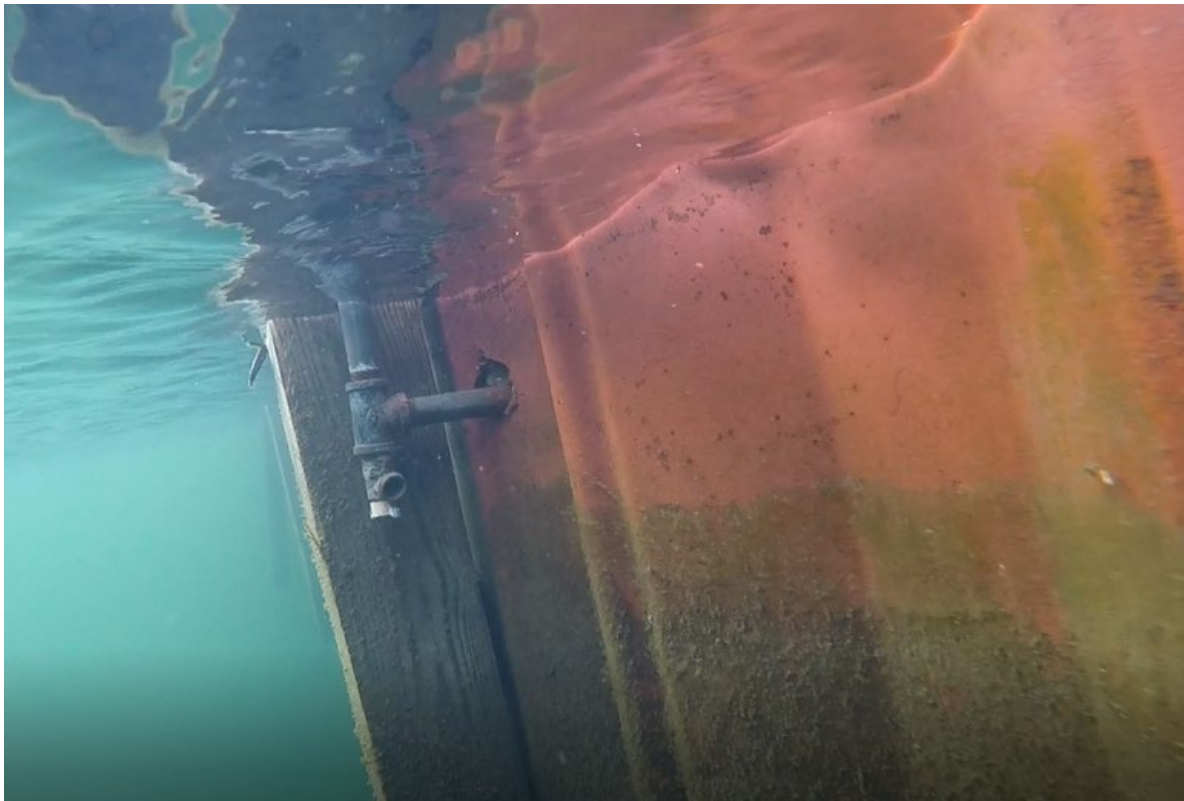
The main pier and walls at Hessel Harbor are steel sheet pile structures that appear to be in good condition. The structures were constructed in 1965 and were inspected from land through the use of underwater photography and ultrasonic measuring devices. A dive survey was not performed. The steel sheet pile structures do not exhibit undue corrosion, and thickness measurements performed by Edgewater Resources indicate that the outer pier and launch sheeting is all around 0.36" in thickness. The sheeting type transitions along the north edge, where the eastern portion near the fork dock is around 0.25" in thickness. The visible tieback connection hardware was present throughout, with no obvious failures or missing components. The walls remain plumb and do not exhibit any signs of significant deflection. Some utility penetrations were observed that may have minor voids given the apparent opening. Fender brackets are generally sound, although some timber fenders have been damaged.



Typical Wall and Fender Bracket



Typical Wall and Tie Back Hardware



Typical Wall and Utility Penetration



The concrete paved pedestrian walkways around the perimeter of the facility are generally sound, but aging and narrower than preferred for current daily and festival use. With the exception of the main fixed pier the walks do not exhibit signs of significant settlement that might indicate subsurface failure of the wall system. The walkway does have areas of raised edges and slopes that do not meet current accessibility standards. The concrete paving on the main fixed pier does exhibit moderate settlement which is more likely caused by settlement of the fill over time rather than a loss of fill materials through failures in the walls themselves. This settlement results in an uneven walking surface and the presence of ponding surface water.

Existing Floating Dock Conditions

The floating dock system is composed of three separate sections. The main pier section located in the center of Hessel Harbor, the outer pier fingers located along the south edge of the harbor, and the Fork Dock located on the north wall of the harbor.

The main floating pier section consists of an 8'x103' main pier with one 3'x20' finger pier, three 3'x30' finger piers, two 3'x40' finger piers, and a 78'x6' T head pier. The floating pier connects to the sheet pile wall via a 24' timber gangway ramp. The floating docks all appear to be a hybrid timber and steel dock system with timber framing/integral floatation lined top and bottom with galvanized steel and galvanized steel brackets and connectors. These floating docks are anchored with a spud pile type anchorage system and appear to have been built to MDNR Standards at the time they were constructed. The main section of the pier was constructed in 1990, while the T Head was added in 2014. The gangway for this section of dock is removed during winter months, and the dock sections are allowed to ice in.



Main Floating Pier

The outer pier fingers are floating docks with integral gangways connecting the outer floating portion to the fixed pier wall and were installed in 1990. There are four 4'x40' finger piers and two 4' x 48' finger piers. The floating docks appear to be a similar hybrid timber and steel dock system with timber framing/integral floatation lined top and bottom with galvanized steel and galvanized steel brackets and connectors. These floating docks are connected to the steel sheet pile wall by a hinged connection with stiff-arm bracing and anchored at the outer end with a spud pile type anchorage system. The finger piers appear to have been built to MDNR Standards at the time they were constructed, and the finger pier spacing complies with current MDNR Standards. These piers are removed during winter months to prevent ice damage.



Sloped Finger Piers

The Fork Dock is a small system of two 4'x24' finger piers connected to a 6'x36' head pier that was installed around 1995. This is in turn connected to steel sheet pile wall by a 16' long gangway. The floating docks appear to be a hybrid timber and steel dock system with timber framing/integral floatation lined top and bottom with galvanized steel and galvanized steel brackets and connectors. The gangway for this section of dock is removed during winter months, and the dock sections allowed to ice in.



Fork Dock Pier

Typically, floating docks of this type have a design life of twenty-five to thirty years, and these systems are approaching the replacement age range. Overall, the floating dock systems are in good condition for their age. The lower galvanized steel sheet metal covering the bottom of the internal flotation foam was intact and sound on the outer pier fingers observed while out of the water. The upper portion of sheet metal was not observed during the inspection. The timber sidewall materials were inspected at various main and finger pier locations, and all appeared to be functional with no major rot or deterioration observed. The decking is beginning to show signs of deterioration with isolated areas of rot, curling, splitting, and delamination observed. Overall, the existing decking is in fair condition and remains functional.

The existing finger pier widths and berth widths of the floating dock systems are consistent with the 2003 MDNR Standards. The existing fairway between the floating docks is approximately 65', which also meets the MDNR criteria of being 1.5x the longest slip length (40').

While the grades were not surveyed, on the date of our site inspection the water level was approximately 581.5, or LWD +4.0. The walking surface of the perimeter walk and outer pier were roughly 12"-15" higher than the water, so we estimate the typical elevation of the walking surfaces to be approximately 582.5 or LWD +5.0. With wind setup and wave action during weather events, this elevation can be inundated, so consideration of raising the outer fixed pier and potentially the inner perimeter to at least 583.6 or LWD +6.0 should be considered. Given these elevations, neither of the existing gangway ramps nor the existing floating finger piers are compliant with the 2010 ADA Standards. The maximum gangway slope allowed by the 2010 ADA is 1:12 at the design water level range, with a maximum required gangway length of 80 feet. In other words, the slope can exceed 1:12 if

the gangway is at least 80 feet long. If the design water level is the all-time low Lake Huron water level of approximately LWD -1.0 and the floating dock has a two foot freeboard, a vertical transition of approximately four feet would exist and the required gangway length for that transition would be 48 feet. The current gangway is 24 feet long and has an additional transition plate that extends a few feet from its end. At least one of these ramps would need to be replaced with a minimum 48' ramp to ensure ADA compliance, and potentially longer if the perimeter walk is raised. ADA dispersion requirements are met by the main floating dock T head and broadside mooring along the outer fixed pier.



Existing Boat Launch and Perimeter Walks



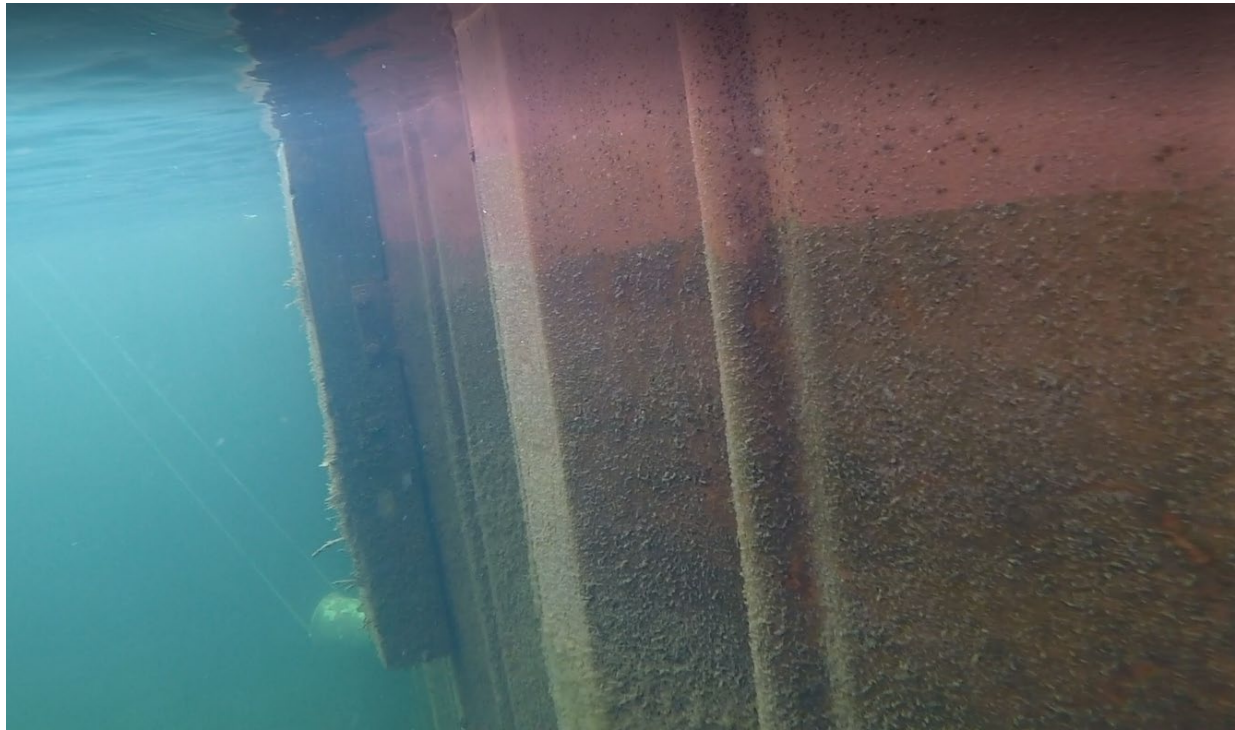
Steel Sheet Pile Seawall

The steel sheet pile seawall was installed in 1965. While no record sheeting plans were provided, the wall appears to be PSA 23 type in unknown lengths. These sheets are anchored by a waler and tierod system based upon the exposed hardware observed. The tierods are anchored at approximate 8' center-to-center spacing. The tierods and hardware that were visually apparent all appeared to be connected and in good condition for their age. The seawall was inspected from land and ultrasonic testing was performed to measure the approximate thickness of the existing steel. The seawall visually appeared to be straight with no apparent deformations or joint separation. Minor rust nodules were observed but for the most part the sheeting appeared to be in good condition. The thickness testing showed that on average the wall had a remaining thickness of approximately 0.362" from its estimate original thickness of 0.375".

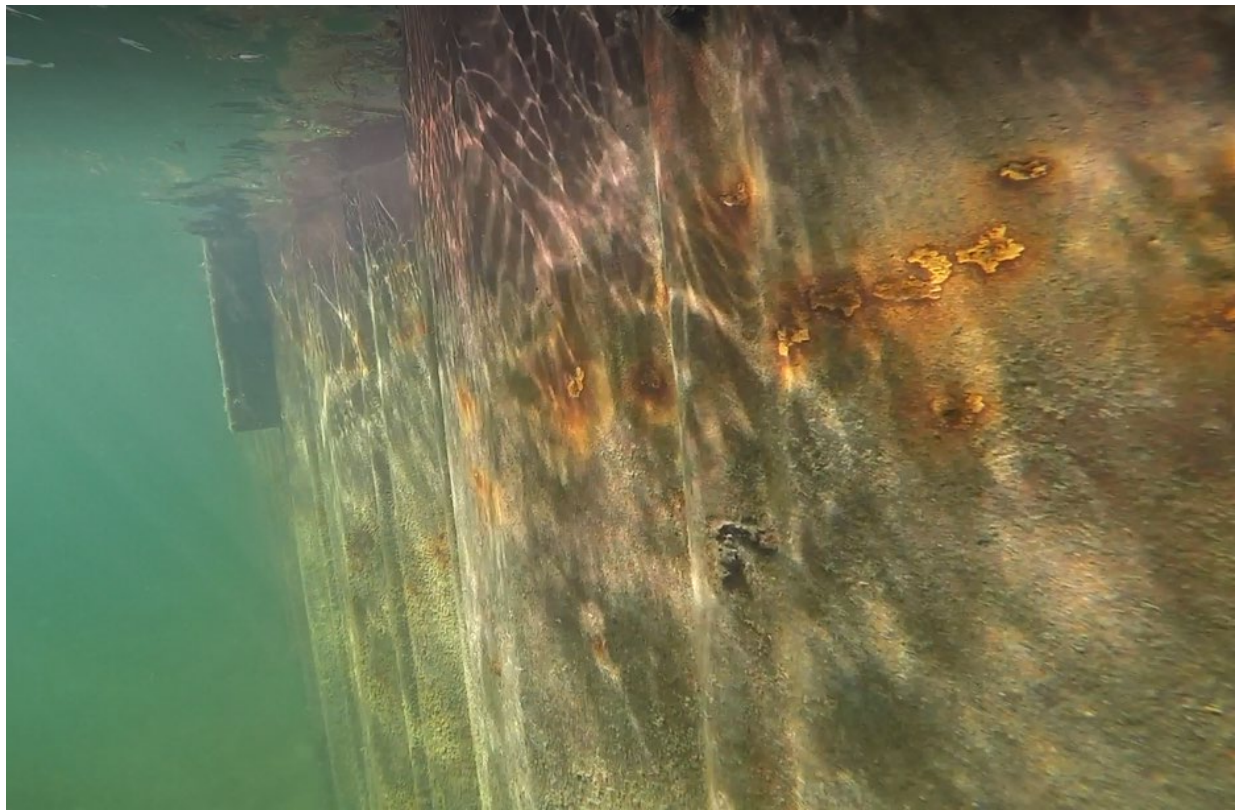
Steel Sheet Piling Sections												
Profile	Section Index		District Rolled	Driving Distance per Pile	Weight		Web Thickness	Section Modulus		Area	Moment of Inertia	
					Per Foot	Per Square Foot of Wall		Per Pile	Per Foot of Wall	Per Pile	Per Foot of Wall	
					In.	Lbs.		Lbs.	In.	In. ³	In. ³	In. ²
	Interlock with Each Other	PSX 32	H.	16½	44.0	32.0	29/64	3.3	2.4	12.94	5.1	3.7
		PS32*	H.S.	15	40.0	32.0	½	2.4	1.9	11.77	3.6	2.9
		PS28	H.S.	15	35.0	28.0	¾	2.4	1.9	10.30	3.5	2.8
	Interlock with Each Other	PSA 28*	H.	16	37.3	28.0	½	3.3	2.5	10.98	6.0	4.5
		PSA 23	H.S.	16	30.7	23.0	¾	3.2	2.4	8.99	5.5	4.1
		PDA 27	H.S.	16	36.0	27.0	¾	14.3	10.7	10.59	53.0	39.8
		PMA 22	H.S.	19¾	36.0	22.0	¾	8.8	5.4	10.59	22.4	13.7

PSA 23 Steel Sheet Piling Section Properties

No record plan information on the sheeting length of adjacent water depth was available for review. Record plans from 1979 indicate water depths of 8-9' below low water datum (LWD). A bathymetric survey was not included in the scope of this study so an analysis of siltation/scour was not performed, however on average the water depths are suitable for mooring vessels that would be expected to use the facility.



Typical Interior Basin Steel Sheet Pile Seawall



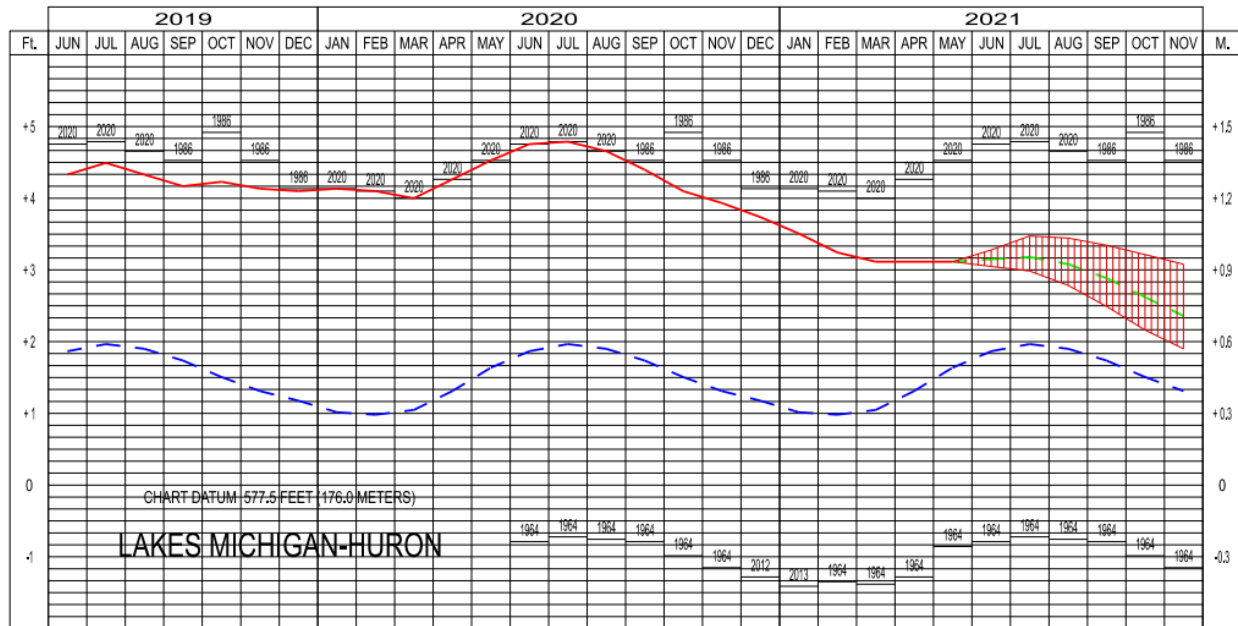
Typical Exterior Basin Steel Sheet Pile Seawall



Water Depths and Basin Conditions

Bathymetric survey was not performed as part of this study; however, water depths are reported to be adequate for regular use. Lake Huron water levels were at monthly mean average record high water levels throughout the 2020 boating season. While still above long-term averages, the lake levels have decreased by over one foot so far in 2021. A detailed bathymetric survey should be performed as part of any future phase of this study.

LAKES MICHIGAN-HURON WATER LEVELS - JUNE 2021



According to conversations with staff, the facility is not subject to significant sedimentation and does not require maintenance dredging on a regular basis. The 2003 MDNR Harbor Standards recommend that harbors should have depths of at least LWD - 8.0' in the areas where larger (35'+) boats maneuver and are moored. The Standards also state that the depths can be reduced in the areas that serve smaller vessels but should not likely be less than LWD - 6.0' in depth.

In summary, the existing depths within the marina area are generally greater than LWD - 5.5'. This depth equates to at least 7.5' for water currently, which is a suitable water depth for most vessels utilizing the marina.

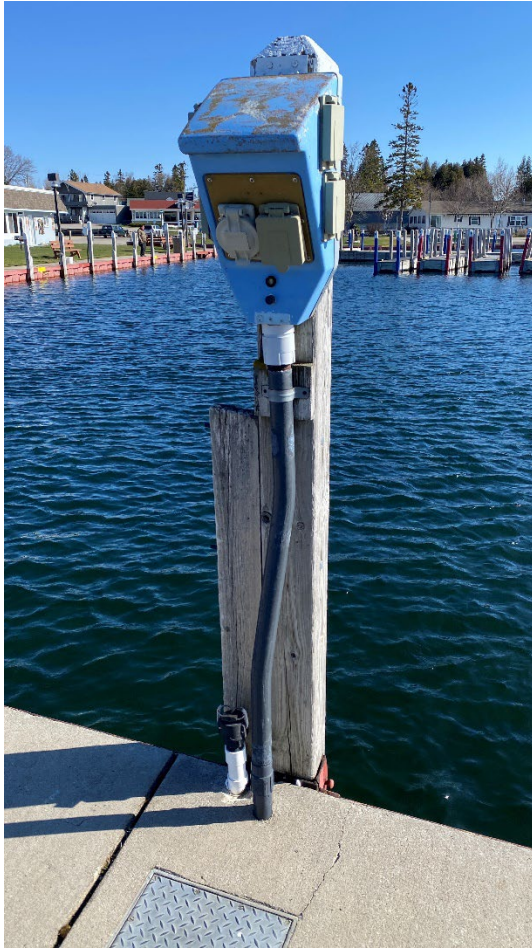


Marina Utilities

The finger piers along the outer fixed pier include potable water and electric utilities, while the floating main pier and fork docks do not offer power or water on the docks. The lack of power on the main dock results in extensive use of extension cords, which are then subject to undue wear while also creating potential trip hazards. The utility systems were reviewed visually to evaluate their apparent condition, but no in-depth testing of individual systems was performed as part of this assessment. While the systems appear to be in functional condition with no major operational deficiencies observed or reported by harbor staff, this field review did not include detailed inspections to determine the condition of electrical junction boxes, review of electrical connections, etc. Note, while the systems are functional, they do not provide sufficient electrical capacity during peak demand. Power and water utilities should be added to the main floating pier and any additional new slips. Gasoline and diesel fuels and sanitary pump-out services are not provided by Hessel Marina, but are available locally at EJ Mertaugh Boat Works.

The potable water system consists of a galvanized steel pipe system with individual hose bibs provided at each slip along the steel sheet pile walls and outer fixed pier. These hose bibs are connected to the existing timber supports that hold the electrical utility pedestals but are completely separate from the electrical system. None of the hose bibs appeared to have required vacuum breakers installed at the time of observation to help prevent the infiltration of lake water into the potable water system. This potable water system is protected by a backflow preventer located within the utility room of the existing boater services building.

Electrical shore power is provided along the seawall and on the outer pier. The receptacle configuration at each slip varies with some including 1 - 30A 120V receptacle for shore power along with 20A GFCI utility outlets while others contain 1 - 50A 240V receptacle and 1 - 30A 120V receptacle for shore power along with 20A GFCI utility outlets. The electrical pedestals are mounted directly to vertical timber fendering that is intended for mooring. This system includes main feeds that are fed from the building and connect to the pedestals through a handhole at each location. This system does not comply with the ground fault protection requirements of the current version of the National Electrical Code, which calls for protection to be applied to both circuit level as well as the main feeder to reduce the likely hood of stray current from an individual vessel or an accumulation of stray current from multiple vessels to exist in the marina. The presence of stray current in the water can be harmful or fatal if someone is to enter the water. The existing electrical system capacity was not reviewed as part of this inspection. Based upon its age and its components, we recommend that a replacement electrical system, with designated marina pedestals, that is compliant with current NEC requirements be considered as part of any improvements to the marina.



Typical Utility Pedestals and Potable Water Service

Ice Suppression

The ice suppression system within the harbor consists of individual flow inducer units (“ice eaters”) located in key areas along the steel sheet pile walls. The general approach to minimizing ice damage relies on either removing outer finger piers from the water and disconnecting the gangways that connect the main floating pier and Fork Dock pier sections. These sections remain in the water and are then allowed to freeze in place. There appears to be little risk of ice shove, and there are no fixed piles subject to ice jacking.

The sidewalks and paths surrounding the site and building all appear to be in good condition for their age and are functional. The sidewalks connecting the parking lot to building all have gentle slopes that appear to be compliant with ADA standards for accessible routes. Two parking spaces are designated as ADA spaces in the parking lot, neither of which appears to be van accessible. Per ADA requirements, at least one of the parking spaces provided needs to meet the clearance requirements for van accessibility. The total number of parking spaces provide, including designated ADA parking spaces, should be reviewed for zoning compliance as part of any dock improvements.



Boater Services Building

The purpose of this Assessment Report is to identify the overall health, welfare and safety issues and of the current condition of the Hessel Marina Services building. The bathroom building is approximately 35'x40' and was constructed in multiple phases. The facility includes both public and boater accommodations, as well as a utility room that houses the building utility supplies and controls as well as some of the marina utility controls and marina laundry facility. The facility is very dated and well past its useful life, and many of the bathroom stalls and shower units are not ADA compliant.

The Hessel Marina Services building at Hessel Marina is a 1,440 sf single story CMU and brick structure with a flat and mansard roof built in 1965. The building started as restrooms and has had several additions throughout its lifetime. Several non-compliant and visually unappealing observations include:

- The flat roof shows signs of water leakage and water damage.
- The laundry exposes boaters to the electrical panels for the marina.
- Electrical panel clearance is not in building code compliance
- The laundry, restrooms floor area clearance and showers are not in ADA compliance
- The aging floor tile is becoming difficult to maintain and clean
- Exterior finishes are aging with peeling paint and mix of materials.
- The building does not meet requirements of the Michigan Uniform Energy Code

The building is not historically significant and not on the state or federal national register. Edgewater Resources recommendation is to remove it and replace it with a new facility that meets all local Zoning Ordinances and State of Michigan Building Codes. Overall, the building appears to be functional, however the age and condition of the finishes will cause it to become more and more difficult to keep clean and presentable to users. Improvements necessary to bring the facility up to current standards will be most cost effectively implemented by a completely new structure.



Boater Services Building South Elevation



Boater Services Building East Elevation and Roof



Restroom Interior



Restroom Interior Showing Non ADA Compliant Fixtures



Restroom Interior w/ partially ADA compliant fixtures

Restroom Building interior conditions





MARINA MARKET ANALYSIS

A comprehensive marina market analysis was not included in the scope of this study, however MDNR has completed a range of similar recent studies that include boater and marina operator surveys that provide relevant context for the improvements proposed at Hessel Harbor. This information, combined with data and feedback provided directly by Clark Township staff were used to establish the goals and program of the Hessel Harbor Master Plan.

Seasonal Occupancy Information

Hessel Harbor currently provides 28 slips, with ten slips currently occupied by seasonal boaters. Seasonal demand has been increasing, and there is a current waiting list for seasonal slips of less than five names. The remaining slips are used for transient mooring, and the four slips on the Fork Dock serve as courtesy day docks for island residents.

Transient Occupancy Information

Hessel Harbor provides eighteen dedicated transient slips and may also rent out seasonal slips to transient boaters whenever seasonal boaters are out of the harbor for multiple days. Additionally, Hessel Marina offers up to 275 linear feet of flexible broadside mooring on the outside of the outer fixed pier. Using the USFWS standard of 26' for a transient slip, this wall could provide an additional ten transient slips, however these slips are somewhat weather dependent since they are not protected from wind and wave action. MDNR and Grant In Aid Facilities like Hessel Marina track transient data through an online reservation system. Summary data for 2017, 2018, 2019, and 2020 were provided by MDNR and indicate both the total number of boats that visit the harbor, and the total number of nights they stay.

We determine the average transient occupancy of MDNR and GIA facilities by dividing the total number of occupied nights by the number of transient slips over the primary 100 day transient boating season. This approach would suggest the interior of Hessel Marina has a total transient capacity of 1,800 slip nights (18 x 100). The outer wall of the outer fixed pier offers ten slips, or 1,000 additional potential transient nights. Since these slips are weather dependent, for the purposes of this analysis, we will reduce that number by half to 500, giving Hessel Marina a total transient slip capacity of 2,300 slip nights per year. By this methodology, the transient occupancy of Hessel Marina was:

- 21.34% in 2017
- 53.17% in 2018
- 71.04% in 2019
- 104.65% in 2020



The data shows a very clear trend towards increase demand and occupancy, to the point where expansion of the facility will be required to respond to any future increase in demand. This level of demand is truly exceptional, although this is in part due to the small size of the facility. In larger facilities, a yearly transient demand figure of 50%-75% is considered very good. The very high demand in 2020 may well be due to restrictions in other activities caused by the Covid 19 statewide restrictions, but the 2018 and 2019 demand numbers remain very strong. Future expansion considerations should review the data from the 2021 and 2022 seasons to assess the impacts of a post Covid 19 boating season.

In addition, the available data suggests the following conclusions:

- Transient occupancy at Hessel Marina has steadily increased over the last four seasons, with a 168% increase in the number of boats from 2017 to 2020, and a 490% increase in the total number of transient nights occupied.
- The average length of stay over the entire season increased from 1.75 nights in 2017 to 5.11 nights per season in 2020, with an overall average over the four seasons of 3.67 nights per stay.
- Unsurprisingly, demand peaks in July and August, while demand remains strong in September and June.
- The month of September has the longest average length of stay of 8 nights, which is more than double the peak demand months of July and August at 3.1 and 3.22 nights respectively. The average length of stay in June is 5.7 nights.

In summary, all of the available indicates very strong and growing transient demand that leaves the marina essentially fully occupied. While the 2020 boating season was exceptional in part due to Covid restrictions across the state in other areas, the increase in demand from 2017 to 2019 was very strong. This is remarkable especially since the facilities at Hessel are not up to current MDNR standards and offer far fewer amenities than would usually be expected at an MDNR or GIA facility. This data suggests that improving the existing facilities to offer power and water, and/or expanding the facility to provide more transient capacity would likely increase the use of this facility.



Hessel Marina Transient Occupancy

Year	May		June		July		August		September		October		Total Boats	Total Nights
2017	Boats	Nights	Boats	Nights	Boats	Nights	Boats	Nights	Boats	Nights	Boats	Nights		
Sail	1	1	11	14	20	35	23	37	4	9	0	0	59	96
Power	1	1	18	29	102	191	88	150	12	24	0	0	221	395
Total	2	2	29	43	122	226	111	187	16	33	0	0	280	491
2018	Boats	Nights	Boats	Nights	Boats	Nights	Boats	Nights	Boats	Nights	Boats	Nights	Boat Total	Nights Total
Sail	0	0	12	50	33	76	53	126	13	45	0	0	111	297
Power	5	17	38	142	127	386	106	315	14	64	1	2	291	926
Total	5	17	50	192	160	462	159	441	27	109	1	2	402	1223
2019	Boats	Nights	Boats	Nights	Boats	Nights	Boats	Nights	Boats	Nights	Boats	Nights	Boat Total	Nights Total
Sail	2	2	8	28	42	98	35	83	11	47	1	1	99	259
Power	7	63	35	174	118	407	126	442	22	239	7	50	315	1375
Total	9	65	43	202	160	505	161	525	33	286	8	51	414	1634
2020	Boats	Nights	Boats	Nights	Boats	Nights	Boats	Nights	Boats	Nights	Boats	Nights	Boat Total	Nights Total
Sail	0	0	9	33	28	68	38	80	7	35	0	0	82	216
Power	0	0	45	275	179	749	132	702	31	449	2	16	389	2191
Total	0	0	54	308	207	817	170	782	38	484	2	16	471	2407
Average	Boats	Nights	Boats	Nights	Boats	Nights	Boats	Nights	Boats	Nights	Boats	Nights	Boat Total	Nights Total
	4	5.25	44	186.25	162.25	502.5	150.25	483.75	28.5	228	2.75	17.25	391.75	1438.75

Average Length of Stay	May	June	July	August	September	October	Combined
2017	1.00	1.48	1.85	1.68	2.06	0.00	1.75
2018	3.40	3.84	2.89	2.77	4.04	2.00	3.04
2019	7.22	4.70	3.16	3.26	8.67	6.38	3.95
2020	0.00	5.70	3.95	4.60	12.74	8.00	5.11
Combined	1.31	4.23	3.10	3.22	8.00	6.27	3.67

Regional Marina Market Analysis

Utilizing data collected through the Harbor Operator Survey in 2019 as part of the MDNR Statewide Harbor Facilities Assessment project, we provide the following trend information from across the region. This includes northern Lake Huron facilities including Straits State Harbor, Mackinac Island State Harbor, St. Ignace Marina, Hessel Marina, Cedarville Marina, and Detour State Harbor. This data suggests the following conclusions:

- All facilities indicate their seasonal occupancy either has remained consistent or increased over the last five years, with no facilities indicating any decrease in seasonal demand.
- All but one facility indicated they have a waiting list for seasonal slips, with an average wait list of 6-10 names and an average wait of two seasons to obtain a slip.
- All facilities indicate their transient occupancy either has remained consistent or increased over the last five years, with no facilities indicating any decrease in transient demand.
- All facilities indicate that their location positively affects their seasonal and transient slip demand. The area between the Mackinac Bridge and the North Channel Islands, including in particular the Les Cheneaux Islands, remain among the most desirable cruising waters on the Great Lakes.
- Three of the facilities, including Hessel, indicated a trend towards demand from longer vessels.
- Additionally, most facilities noted increasing demand for improved power, Wi-Fi, and restroom/shower facilities.



While these trends mirror the overall trends identified across all MDNR and GIA facilities, they are particularly acute in this area due to the very high attractiveness of the northern Lake Huron region for transient boating.

Seasonal Slip Rates

Hessel Marina utilizes the MDNR Waterways Program Standard Rate Schedule 6 for seasonal slips.

MDNR 2021 Seasonal Rate 6 Schedule:

- 30' slip: \$2,040
- 35' slip: \$2,380
- 40' slip: \$2,720
- 45' slip: \$3,060
- 50' slip: \$3,400
- 60' slip: \$4,080



Transient Slip Rates

Hessel Marina utilizes the MDNR Waterways Program Standard Rate Schedule D for transient slips

MDNR Waterways Program 2021 Transient Rate D Schedule:

- 30' slip: \$37 / Night
- 35' slip: \$43 / Night
- 40' slip: \$50 / Night
- 45' slip: \$56 / Night
- 50' slip: \$62 / Night
- 60' slip: \$74 / Night

Services & Amenities

Not all amenities are necessary to all boaters. While amenities such as showers, laundry, and ship's store are more important to transient boaters, seasonal slip holders focus their demand on excellent restrooms and consistent Wi-Fi.

The bathhouse facilities, including restroom, showers, and laundry, is the single most important landside amenity provided by marinas. Restrooms that are well maintained should be located conveniently to the docks and would ideally be dedicated to the marina users. Where Boater Services buildings provide restrooms for the general public, they should be separate from boater restrooms, which should be locked and accessible only to registered slip holders or transient guests for security, cleanliness, and convenience. Where public restroom facilities are available immediately nearby, Boater Services buildings can and should exclude public restrooms for the security and comfort of the boaters, who often travel with families and small children and may need to use the facilities at all hours of the day and night.



CONCLUSIONS and FUTURE DEVELOPMENT RECOMMENDATIONS

In summary, Hessel Marina is fortunate to be located within some of the most beautiful cruising grounds in all of the Great Lakes, near all of the tourist attractions of the eastern Upper Peninsula and northern Lower Peninsula, and well situated between major destinations along the cruising routes of northern Lake Huron and Lake Michigan.

The available transient occupancy data for the facility indicates that the facility is very busy throughout the season, with exceptional demand higher than is typical for GIA facilities elsewhere. Seasonal occupancy is consistent and remains at 100% with a waiting list. Transient occupancy has increased every year at least since 2017, and the Operator Survey of other harbors in the region indicate that demand for both seasonal and transient vessels is increasing or holding steady in all but one of the facilities that participated for the 2019 season, and also trending upwards or holding steady in all but one of the facilities over the last five years. Hessel Marina reported increases in both seasonal and transient occupancy in 2019 and over the last five years.

Key Strategies

We recommend the following key strategies for the future development of Hessel Marina:

- Replace the existing boater services building and restroom facilities to meet modern standards, and consider the addition of a boater's lounge, dedicated laundry, and office facilities for marina staff
- Facilitate improved pedestrian connections between the marina and the Hessel community
- Improve the existing dock infrastructure to meet current ADA and MDNR guidelines for safety and functional usefulness
- Improve utility infrastructure and meet all new ESD codes
- Provide ADA compliant paddle craft access
- Pursue a phased implementation based on existing demand and expand in future phases as demand increases
- Expand the marina to include a new Courtesy Day Dock basin to improve access to the mainland for island residents, including a more functional boat launch for construction materials and large items
- Collaborate with the Village of Hessel and adjacent private businesses/landowners to consider modifications to the upland park areas around the waterfront to create a continuous public waterfront promenade and greatly expanded green space adjacent to the harbor
- Consider shared parking strategies that create dedicated marina parking near the waterfront, but not necessarily directly adjacent to the water, to reduce the amount of unnecessary pavement near the water's edge and greatly expand public green space
- Specific Program Elements include:
 - Improve Site Circulation
 - Improve Boater Services Building
 - Bring Utilities Up to MDNR Standards
 - Replace Floating Finger Docks



- Maintain Water Depths
- Increase Transient Day Docks
- Improve Transient Loading
- Expand Transient Mooring

Concept Plan Alternative Process

Utilizing the strategies outlined above, a series of three initial concepts were prepared that were based on three primary approaches. Concept Alternative A suggested minor improvements to the main marina basin, and a new Courtesy Day Dock basin with access to the west. Concept Alternative B followed a similar approach with additional mooring, but provided access from the south. Concept Alternative C proposed a much more significant overhaul of the entire waterfront, with a much larger marina. These options were presented to the community during a public meeting, with the community indicating a preference for a revised plan that incorporates elements of all three initial concepts. The final consensus master plan incorporates the preferred upland building location from Concept A with the general marina basin organization of Concept B, while allowing for the future expansion opportunities outlined in Concept C.

Comments included:

- The western access to the Courtesy Day Docks shown on Concept A is less desirable due to potential conflicts with the adjacent private home and submerged breakwater.
- The southern access to the Courtesy Day Docks shown on Concept B is better, and allows for future expansion.
- Increasing the number of slips within the main marina basin is desired
- Consider the impacts on the neighboring property to the west in the final layout of the parking and circulation.
- While alternative locations for the boater services building were considered, the preferred location remains the existing site adjacent to the marina.
- While the removal of the existing boat launch creates more open green space on the waterfront, the preference is to keep it in place for use during the boat show and for emergencies.



CONCEPT A

Concept A outlines a plan for minimum improvements to achieve compliance with MDNR guidelines, as well as ADA and code requirements. Key features of the plan include:

- A) Replacement of the existing restroom building with an entirely new structure in the same location as the existing building
- B) Reconfiguration of the vehicular circulation system to improve egress of vehicles with trailers
- C) Replacement of the Fork Dock with four new finger piers along the north wall of the marina basin
- D) Extension of the outer fixed pier to the west to increase transient mooring capacity by 180 linear feet
- E) Addition of a Courtesy Day Dock basin for up to eighteen boats under 25', with access from the west
- F) Addition of a new service launch ramp and dock for larger items and construction materials for the islands
- G) Comprehensive upgrade of all marina utilities to meet current codes and ESD standards
- H) Site infrastructure upgrades to include replacement of walks and outer fixed pier walking surface

Slip Count:

Eighteen (18) twenty-five foot (25') slips

Ten (10) thirty-foot (30') slips

Twenty (20) forty-foot (40') slips

Four (4) forty-eight foot (48') slips

460 linear feet Broadside Mooring

69 total slips, 2,202 linear feet total



CONCEPT A					
	Work Items	Units	Qty	Unit Price	Total Price
1.0	<i>General</i>				
1.1	Mobilization & General Conditions	LS	1	\$160,000	\$160,000
1.2	Demolition	LS	1	\$37,000	\$37,000
2.0	<i>Site Work & Shore Facilities</i>				
2.1	Asphalt Parking	SF	15200	\$12	\$182,400
2.2	Concrete Sidewalk	SF	3700	\$15	\$55,500
2.3	Landscaping	SF	15000	\$6	\$90,000
2.4	New Building	SF	1375	\$400	\$550,000
3.0	<i>Concrete Boat Launch</i>				
3.1	CIP Concrete Paving	SF	260	\$75	\$20,000
3.2	Sheet Pile Bulkheads	LF	60	\$1,250	\$75,000
3.3	Skid Pier	EA	1	\$15,000	\$15,000
4.0	<i>Marina</i>				
4.1	Dredging	CY	3500	\$50	\$175,000
4.2	Steel Sheet Pile Crib	SF	2700	\$285	\$770,000
4.3	Concrete Crib Decking Replacement	SF	6000	\$20	\$120,000
4.4	Finger Piers	SF	1725	\$100	\$173,000
4.5	East Basin Marine Plumbing	/SLIP	45	\$800	\$36,000
4.6	East Basin Marine Electrical	/SLIP	45	\$8,000	\$360,000
Subtotal					\$2,818,900
20% Contingency					\$564,000
Total					\$3,382,900

* Heavy floating dock option modification

4.2	Heavy Floating Docks	SF	2700	\$75	\$203,000
Subtotal					\$2,252,000
20% Contingency					\$450,000
Total					\$2,702,000

** Full marine utilities for all docks

4.5	Marine Plumbing**	/SLIP	45	\$800	\$36,000
4.6	Marine Electrical**	/SLIP	45	\$8,000	\$360,000
Subtotal					\$3,215,000
20% Contingency					\$643,000
Total					\$3,858,000







CONCEPT B

Concept B outlines a plan for improvements to achieve compliance with MDNR guidelines, as well as ADA and code requirements, plus upland improvements to expand parking and construct a new boater services building. Key features of the plan include:

- A) Replacement of the existing restroom building with an entirely new structure located to the northeast of the existing boat launch
- B) Reconfiguration of the vehicular circulation system to improve egress or vehicles with trailers
- C) Replacement of the Fork Dock with four new finger piers along the north wall of the marina basin
- D) Expansion of public green space on the waterfront, with a more open park environment to support day to day activities and special festival events
- E) Addition of a Courtesy Day Dock basin for up to twenty boats under 25', with access from the south
- F) Addition of a new service launch ramp and dock for larger items and construction materials for the islands
- G) Comprehensive upgrade of all marina utilities to meet current codes and ESD standards
- H) Site infrastructure upgrades to include replacement of walks and outer fixed pier walking surface

Slip Count:

Twenty (20) twenty-five foot (25') slips

Ten (10) thirty-foot (30') slips

Twenty (20) forty-foot (40') slips

Four (4) forty-eight foot (48') slips

440 linear feet Broadside Mooring

71 total slips, 2,232 linear feet total



CONCEPT B					
	Work Items	Units	Qty	Unit Price	Total Price
1.0	General				
1.1	Mobilization & General Conditions	LS	1	\$172,000	\$172,000
1.2	Demolition	LS	1	\$35,000	\$35,000
2.0	Site Work & Shore Facilities				
2.0	Asphalt Parking	SF	15200	\$12	\$182,400
2.1	Concrete Sidewalk	SF	7500	\$15	\$112,500
2.2	Landscaping	SF	15500	\$6	\$93,000
2.3	New Building	SF	1375	\$400	\$550,000
3.0	Concrete Boat Launch				
3.1	CIP Concrete Paving	SF	625	\$75	\$47,000
3.2	Sheet Pile Edge Wall	LF	80	\$1,250	\$100,000
3.3	Skid Pier	EA	1	\$15,000	\$15,000
4.0	Marina				
4.1	Dredging	CY	3000	\$50	\$150,000
4.2	Excavation	CY	7500	\$20	\$150,000
4.3	Concrete Crib Decking Replacement	SF	6000	\$20	\$120,000
4.4	Sheet Pile Shore Protection	LF	275	\$1,250	\$343,750
4.5	Heavy Floating Docks	SF	2700	\$150	\$405,000
4.6	Gangway	EA	1	\$40,000	\$40,000
4.7	Finger Piers	SF	1725	\$75	\$129,000
4.8	East Basin Marine Plumbing	/SLIP	45	\$800	\$36,000
4.9	East Basin Marine Electrical	/SLIP	45	\$8,000	\$360,000
Subtotal					\$3,040,650
20% Contingency					\$608,000
Total					\$3,648,650

* Wave fence with standard floating dock option modification

4.5a	Standard Floating Docks	SF	2700	\$75	\$203,000
4.5b	Sheet Pile Wave Fence	LF	350	\$1,500	\$525,000
Subtotal					\$3,364,000
20% Contingency					\$673,000
Total					\$4,037,000

* Crib option modification, no gangway

4.5	Steel Sheet Pile Crib	SF	2700	\$485	\$1,310,000
Subtotal					\$3,906,000
20% Contingency					\$781,000
Total					\$4,687,000

** Full marine utilities for all docks

4.5	Marine Plumbing**	/SLIP	49	\$800	\$39,000
4.6	Marine Electrical**	/SLIP	49	\$8,000	\$392,000
Subtotal					\$3,076,000
20% Contingency					\$615,000
Total					\$3,691,000







CONCEPT C

Concept C outlines a plan with significant expansion and improvements to achieve compliance with MDNR guidelines, as well as ADA and code requirements, plus upland improvements to expand parking and construct a new boater services building. Key features of the plan include:

- A) Replacement of the existing restroom building with an entirely new structure located at the far eastern end of the site along the north wall
- B) Reconfiguration of the vehicular circulation system to improve egress of vehicles with trailers
- C) Removal of the existing boat launch and replacement with a new launch along the western edge of the site
- D) Replacement of the Fork Dock with five new finger piers along the north wall of the marina basin
- E) Significant expansion of public green space on the waterfront, with a more open park environment to support day to day activities and special festival events
- F) Addition of a Courtesy Day Dock basin for up to twenty boats under 25', with access from the south
- G) Addition of a new service launch ramp and dock for larger items and construction materials for the islands
- H) Comprehensive upgrade of all marina utilities to meet current codes and ESD standards
- I) Site infrastructure upgrades to include replacement of walks and outer fixed pier walking surface
- J) Expansion of the outer marina basin to accommodate six new 60' slips, twelve new 50' slips, and 560 linear feet of additional broadside mooring

Slip Count:

Twenty (20) twenty-five foot (25') slips

Twelve (12) thirty-foot (30') slips

Eighteen (18) forty-foot (40') slips

Four (4) forty-eight foot (48') slips

Sixteen (16) fifty foot (50') slips

Six (6) sixty foot (60') slips

560 linear feet Broadside Mooring

97 total slips, 3,492 linear feet total



CONCEPT C					
	Work Items	Units	Qty	Unit Price	Total Price
1.0	<i>General</i>				
1.1	Mobilization & General Conditions	LS	1	\$437,000	\$437,000
1.2	Demolition	LS	1	\$114,000	\$114,000
2.0	<i>Site Work & Shore Facilities</i>				
2.1	Asphalt Parking Lot	SF	9100	\$12	\$109,000
2.2	Concrete Sidewalk	SF	18000	\$15	\$270,000
2.3	Landscaping	SF	30000	\$6	\$180,000
2.4	Fill (Existing Launch)	CY	700	\$35	\$24,500
2.5	Sheet Pile (Existing Launch)	LF	50	\$1,250	\$62,500
2.6	New Building	SF	1375	\$400	\$550,000
3.0	<i>Concrete Boat Launch</i>				
3.1	CIP Concrete Paving	SF	1200	\$75	\$90,000
3.2	Skid Pier	EA	1	\$15,000	\$15,000
4.0	<i>Marina</i>				
4.1	Dredging	CY	15556	\$50	\$778,000
4.2	Steel Sheet Pile Crib	SF	13200	\$285	\$3,762,000
4.3	Concrete Crib Decking Replacement	SF	6000	\$20	\$120,000
4.4	Finger Piers	SF	5350	\$100	\$535,000
4.5	East Basin Marine Plumbing	/SLIP	77	\$800	\$62,000
4.6	East Basin Marine Electrical	/SLIP	77	\$8,000	\$616,000
Subtotal					\$7,725,000
20% Contingency					\$1,545,000
Total					\$9,270,000

* Heavy floating docks option modification, no steel sheet pile crib

4.2a	Heavy Floating Docks	SF	13200	\$150	\$1,980,000
4.2b	Gangway	EA	1	\$40,000	\$40,000
Subtotal					\$5,983,000
20% Contingency					\$1,197,000
Total					\$7,180,000

** Full marine utilities for all docks

4.5	Marine Plumbing**	/SLIP	74	\$800	\$59,000
4.6	Marine Electrical**	/SLIP	74	\$8,000	\$592,000
Subtotal					\$7,698,000
20% Contingency					\$1,540,000
Total					\$9,238,000







CONCEPT MASTER PLAN

Based on community and boater feedback received in the public meeting and review comments from Clark Township operations staff, as well as a number of subsequent meetings with the Township, the Concept Master Plan was developed through a series of iterative plans based on a hybrid of ideas from Concepts A, B, and C.

Parking and Circulation

The proposed plan expands the boat launch circulation area to improve turning movements while providing access to a new primary two boat launch oriented south within the new Courtesy Day Dock basin. The existing boat launch will remain, however it will be used only for special events and emergencies. The existing parking area at the east end of the site is reoriented, with a portion of the lot converted to public green space for improved views and support for special events. Pedestrian circulation paths along the edges of all green spaces provide safer, more direct access to the waterfront area.

Boater Services Building

The plan proposes an entirely new boater services building situated approximately in the location of the current facility. The new building will include dedicated restroom and shower facilities, laundry, boater lounge, harbor master office, and utility/storage areas. The facility will be fully code compliant and meet all modern MDNR standards. The proposed facility is approximately 1,375 sf. Consideration in the design of the structure should be given to minimizing impacts on views, however we do not recommend a flat roof in this climate.

Utilities

As part of the overall reconstruction of the site infrastructure, all new potable water and electrical utilities will be provided throughout the upland areas and marina to meet current codes and standards. Ground fault protection will greatly reduce the risk of Electric Shock Drowning, and electrical capacity at each slip will be increased to meet current and anticipated growth in demand. Consideration should be given to adding individual electrical metering to each pedestal, which has been shown to decrease energy usage by more than 30%. Power and potable water should be added to all seasonal and transient docks facilities, with basic maintenance power provided on the docks within the Courtesy Day Dock basin.

As part of the overhaul of utilities, the pump-out system will be replaced with a new point of service unit. Wi-Fi services are proposed to be enhanced to provide high speed Wi-Fi at each slip through a third party vendor. An improved potable water supply system should be considered, along with a more flexible upland electrical system to support outdoor festival activities.



The overall site lighting system should be overhauled to eliminate the taller pole mounted lights and replace them with dark sky compliant low level bollard lighting, which will reduce energy costs, improve navigational safety, and protect the views of the night sky from unnecessary light pollution.

Marina Layout

Hessel Marina Basin

The proposed configuration of the marina will be organized into the main Hessel Marina Basin to the east, and the new Courtesy Day Dock basin to the west. Within the Hessel Marina Basin, the Fork Dock is proposed to be replaced with a series of finger docks along the north wall. This will take advantage of the reduced use of the existing boat launch to allow the addition of eight new slips ranging in size from 25'-50' in length.

The central floating dock will be expanded to the east to increase the total number of slips to 20. If practical, modern potable water and marine electrical systems should be added to this dock system, and consideration given to extending the length of the gangway to achieve ADA compliance in a wider range of water levels.

Consideration should be given to the fact that nearly all of the existing floating dock infrastructure in the main basin were constructed and installed in the early 1990s and are now thirty years old or more. While they are generally in very good condition for their age, floating docks of this type typically have a useful life expectancy of 25-30 years. This suggests that at some point over the next ten years or so, these docks will likely need to be replaced. While adding power and water utilities to the main floating pier is highly desirable, the cost to install those systems on docks with a relatively short lifespan remaining may be cost prohibitive.

Outer Fixed Pier and Broadside Mooring

The elevation of the outer fixed pier is estimated to be LWD +5.5, which is less than one foot above record high water level for Lake Huron. With the need to install new utilities and correct the settling pavement, we recommend raising the elevation of the outer fixed pier to at least LWD +6 or +6.5. We also recommend the installation of an improved timber fendering system, both along the face of the steel sheet pile wall and including more robust vertical fenders to accommodate larger ferry or superyacht vessels.

In all cases, we recommend separating the marina utility systems from the vertical fenders as damage to the fender puts the utility system at risk.

Courtesy Day Dock Basin

The Courtesy Day Dock Basin is located within a new basin to the west of the existing facility, formed by a heavy timber floating dock system similar to that installed at EJ Mertaugh Boat Works. The new timber floating dock system is connected to land by an ADA compliant aluminum gangway. The dock



system extends to the south approximately 250', and then extends eastward approximately 150' to form a protected inner basin. Slips and broadside mooring space for up to twenty 25' boats are provided and are intended to serve island residents accessing the mainland. An ADA compliant floating kayak/paddle craft launch dock is located near the gangway entry.

A new primary two lane boat launch is proposed immediately west of the boater services building, which will be designed to serve normal boat launching operations as well as transfer of construction materials to work barges/vessels. The east wall of the Day Dock basin will be improved from the existing mix of armor stone revetment and steel sheet pile to all sheet pile with timber fendering to facilitate additional staging and transient boating.

Future Phase Expansion

If demand warrants at some point in the future, an additional expansion phase is shown. This plan would add significant additional mooring opportunities for seasonal and transient vessels by extending the length of the Day Dock basin floating dock system approximately 150' further south and extending the length of the east west leg by approximately 80'. Additionally, another basin would be created immediately south of the existing outer fixed pier. This basin would be approximately 130' by 270' and formed by either a fixed pier or heavy floating timber docks. This expansion would add 29 new larger slips and increase the total length of flexible broadside mooring and would increase the overall capacity of the marina by 63% in terms of total linear feet of dock space.

Concept Master Plan

Twenty (20) 20' slips:	400lf
Two (2) 25' slips:	50lf
Twelve (12) 30' slips:	360lf
Twenty (20) 40' slips:	800lf
Eighteen (18) 48' slips:	288lf

<u>Flexible Broadside:</u>	<u>420lf</u>
91 Slips	2,318lf

Future Expansion Plan

Twenty (20) 20' slips:	400lf
Two (2) 25' slips:	50lf
Twelve (12) 30' slips:	360lf
Twenty (22) 40' slips:	880lf
Eighteen (18) 48' slips:	288lf
Twelve (13) 50' slips:	600lf
Six (6) 55' slips:	330lf

<u>Flexible Broadside:</u>	<u>890lf</u>
123 Slips	3,798lf



PHASE I					
	Work Items	Units	Qty	Unit Price	Total Price
1.0	<i>General</i>				
1.1	Mobilization & General Conditions	LS	1	\$187,000	\$187,000
2.0	<i>Site Work & Shore Facilities</i>				
2.1	Demo Main Asphalt Parking	SF	9600	\$4	\$38,400
2.2	New Main Asphalt Parking	SF	16100	\$8	\$128,800
2.3	Demo Eastern Asphalt Parking	SF	7350	\$4	\$29,400
2.4	New Eastern Asphalt Parking	SF	3025	\$8	\$24,200
2.5	Landscape Half of Eastern Parking	SF	4400	\$6	\$26,400
2.6	Demo Concrete Sidewalk	SF	4500	\$5	\$22,500
2.7	New Concrete Sidewalk	SF	11750	\$10	\$117,500
2.8	Demo Building	SF	1400	\$10.00	\$14,000
2.9	New Building	SF	2100	\$400	\$840,000
2.10	Landscape Around Building	SF	8165	\$6	\$48,990
2.11	Gazebo Replacement	SF	315	\$75	\$23,625
3.0	<i>Concrete Boat Launch</i>				
3.1	Remove Rip Rap	LS	1	\$20,000	\$20,000
3.2	CIP Concrete Launch	SF	1625	\$20	\$32,500
3.3	Sheet Pile Bulkheads	LF	155	\$1,250	\$193,750
3.4	Skid Pier	EA	1	\$15,000	\$15,000
3.5	Launch Cofferdam	EA	1	\$40,000	\$40,000
4.0	<i>Dredging</i>				
4.1	Dredging	CY	3000	\$50	\$150,000
5.0	<i>Northern Finger Piers</i>				
5.1	Demo Existing Finger Piers	LS	1	\$3,500	\$3,500
5.2	Finger Piers	SF	435	\$100	\$43,500
5.3	Marine Plumbing	/SLIP	8	\$800	\$6,400
5.4	Marine Electrical	/SLIP	8	\$8,000	\$64,000



6.0	<i>Central Floating Piers</i>				
6.1	Lengthen Pier & Add Fingers	SF	840	\$75	\$63,000
6.2	Marine Plumbing	/SLIP	20	\$800	\$16,000
6.3	Marine Electrical	/SLIP	20	\$8,000	\$160,000
7.0	<i>Existing Southern Crib Pier</i>				
7.1	Demo Concrete Decking	SF	5200	\$10	\$52,000
7.2	Demo Finger Piers	LS	1	\$6,000	\$6,000
7.3	New Concrete Decking	SF	5200	\$20	\$104,000
7.4	Replacement Finger Piers	SF	1020	\$100	\$102,000
7.5	Replacement Slip Utilities	LS	1	\$150,000	\$150,000
7.6	Sanitary Pumpout	LS	1	\$50,000	\$50,000
8.0	<i>Floating Courtesy Pier</i>				
8.1	60' ADA Gangway	EA	1	\$40,000	\$40,000
8.2	Gangway Abutment	LS	1	\$110,000	\$110,000
8.5	Kayak Launch	LS	1	\$20,000	\$20,000
8.6	Floating Dock & Fingers	SF	4813	\$75	\$360,975
				Subtotal	\$3,303,440
				20% Contingency	\$661,000
				Total	\$3,964,440

A.0	<i>Alternate: Floating Courtesy Pier Utilities</i>				
A.1	Marine Plumbing	/SLIP	17	\$800	\$14,000
A.2	Marine Electrical	/SLIP	17	\$8,000	\$136,000
				Subtotal	\$3,462,440
				20% Contingency	\$692,000
				Total	\$4,154,440



PHASE II					
	Work Items	Units	Qty	Unit Price	Total Price
1.0	<i>General</i>				
1.1	Mobilization & General Conditions	LS	1	\$60,000	\$60,000
2.0	<i>Floating Dock off of South Fixed Pier</i>				
2.1	Floating Dock & Floating Fingers	SF	5518	\$75	\$413,850
2.2	Fixed Fingers	SF	675	\$100	\$67,500
2.3	60' ADA Gangway	EA	1	\$40,000	\$40,000
2.4	Marine Plumbing	/SLIP	15	\$800	\$12,000
2.5	Marine Electrical	/SLIP	15	\$8,000	\$120,000
3.0	<i>South Fixed Pier Edge Crib</i>				
3.1	Sheet Pile Bulkheads	LF	86	\$1,250	\$107,500
3.2	Crib Fill	CY	89	\$40	\$3,556
3.3	Concrete Decking	SF	240	\$20	\$4,800
4.0	<i>Courtesy Dock Upgrades</i>				
4.1	Floating Dock System Elongation	SF	880	\$75	\$66,000
4.2	Marine Plumbing	/SLIP	19	\$800	\$15,200
4.3	Marine Electrical	/SLIP	19	\$8,000	\$152,000
				Subtotal	\$1,062,406
				20% Contingency	\$212,000
				Total	\$1,274,406



Phase 1



Phase 2



NEAL RESIDENCE SUPPLEMENTAL STUDY

Subsequent to the completion of the Hessel Marina Master Plan completed in June of 2021, the property immediately adjacent to the west of Hessel Marina known as the Neal Residence became available for sale. The Township decided to explore the possibility of acquiring the property to expand the marina, increase public waterfront, and implement a more cost effective means of providing the necessary boater service facilities and other public uses.

Existing Neal Residence and Garage Assessment

The Neal residence building is a 5,500 sf. residence with approximately 2,000 sf basement. Originally built as the Fenton Store in 1907, this was a two story, rectangular, wood framed structure with a simple gable roof and second story dormer windows. Over time there have been two single story additions on the east and west and in 1998 it was renovated into the Neal Family Home. The property includes a free standing wood framed, single story, two car garage, 115' of water frontage on Lake Huron and private docks.

The home is in good condition. It's been well cared for, appears structurally sound, shows no signs of water damage or decay and usual wear and tear.

There are several advantages to renovating this building into the Clark Township Marina Offices, Boater Amenities on the main and basement floors and a second floor Marina Guest vacation rental supporting the marina expansion to add attractive and practical amenities to the boater experience in Hessel.

Existing Building location and scale

- The buildings proximity and walk out building on the water side accommodates a second story direct view of the marina and extended views of Lake Huron.
- Site amenities of the connection to both the street and the docks accommodates all staff vehicles and services on both the water and land
- The existing garage location is well situated and adequately sized to be renovated into a bath house accommodating restroom and shower facilities on a concrete floor
- The main floor balcony overlooks Lake Huron and the marina for boaters to enjoy the outdoor space and connect to the natural beauty with extended views of the islands and the lake.
- The orientation of the existing building to the new marina gives newly arriving guest boaters a direct view and connection to the Marina Staff and amenities

Existing Building Space Planning and Programming

- A walk out basement on the water side accommodates access to storage, a garage and workshop space in the basement . There are two garages in this building. One at grade facing



Lake Street and the second garage at the basement level facing the east driveway. This is ideal for Clark Township Harbor operations, maintenance and seasonal storage uses with two grade level, garage door access points.

- ADA accommodations:
 - Main floor ADA compliant entry at grade is easily accomplished for both the Marina Office and Boater services proposed uses. Once inside, the building is equipped with an elevator accessing both levels. The elevator cab appears to meet the minimum size for ADA compatibility in an existing building.
 - ADA restrooms, door widths, signage and floor clearances are easily accomplished. Some of the existing spaces are already ADA compatible.

Marina Offices, Staff Spaces and Seasonal Storage:

- The current owner's suite on the main floor southeast corner, would be allocated for the Marina Harbormaster offices overlooking the marina and will include a working desk area and the current kitchenette in the raised main floor suite. The large rooms to the east of the main entry will be staff spaces or public/private conference meeting rooms with attached restrooms and the potential to connect to the main office on the southeast corner.

Boaters Amenities

- The current main floor living room in the center of the south side, will be converted into a comfortable boater's lounge with a fireplace, television, soft seating, a wet bar, a covered porch overlooking the marina, a boaters Laundry and restroom. Access to the boater's amenities can be directly from the marina via the southwest flight of stairs, or through the ADA compliant front entry on Lake Street.

Boater vacation rental

- The second floor of the home is currently a three bedroom suite with a generous living room, dining room and kitchen. It has a full width second floor balcony deck that overlooks the harbor and Lake Huron. Two bedrooms have private bathrooms with a third full bathroom and laundry room centrally located in the suite. The elevator makes this an ADA accessible vacation rental. Revisions to door openings and possibly to bathroom fixtures will make this a completely ADA compatible unit.

Existing Neal Home Garage:

- The unattached garage is a single story, wood framed structure. It is 24' x 27'-8" and 664 square feet, which is large enough for ADA compliant restrooms and showers for



the marina boaters. This building will have a locking device that allows use by only those registered boaters docked in the marina and not the general public.

RECOMMENDATIONS

Public Restroom at the Hessel Marina

- Remove and replace the existing restroom structure with a new Public Restroom Building of approximately 700 square feet in the same location. This will include ADA compliant restrooms for men and women, two universally designed family restrooms, a centrally located plumbing alley, a janitor sink and storage for cleaning supplies, paper goods and seasonal items and an exterior drinking fountain and bottle filler. Showers are optional and could be included if Clark Township prefers.

Neal Residence Property

- Renovate the existing 648 sf Neal Home garage into an amenity for marina boaters. A new Bath House including restroom and shower facilities will be planned for this building. The facility will be ADA compliant and support the marina expansion.
- Renovate the Neal House to include:
 - Basement and Main floor spaces will be allocated for the Marina Harbormaster including meeting spaces, staff offices and break room with lockers, staff restroom, storage and maintenance for supplies and vehicles needed for marina operations.
 - Main floor renovation for marina boater amenities to include a boaters Lounge, laundry, connection to the Harbor Master office and restrooms. A Ships store will be included if that fits into the existing footprint. A building renovation without an addition is expected with this program.
 - Second floor renovation includes an ADA accessible, three-bedroom marina guest vacation rental. This is an income generating overnight rental that can be reserved by anyone docking a boat for a minimum one night stay in the Clark Township Marina.

Existing Neal Residence and Garage Photos

Home exterior, Garage exterior and interior





Basement: Proposed Marina Operations, Maintenance and Storage

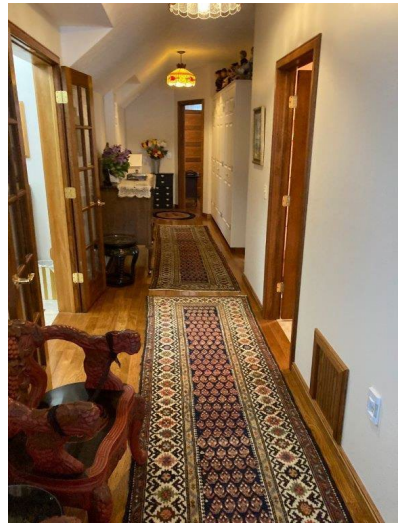
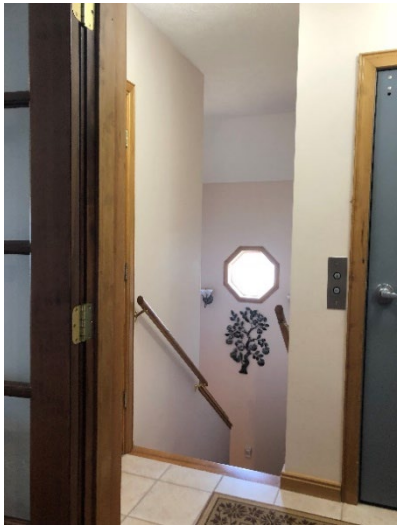


Main Floor: Marina Offices, Boaters Amenities





Second Floor: Proposed Marina Guest Vacation Rental





CONCEPT MASTER PLAN FUTURE EXPANSION

With the opportunity to acquire the adjacent Neal Residence property, the planning team and Township staff explored a range of possible modifications to the approved Concept Master Plan to take best advantage of the additional water frontage. The planning team incorporated the comments, feedback, and community input received through the development of the Concept Master Plan to guide the revised plan that follows.

The overall concept suggests modifying the existing Hessel Marina basin to support island resident day docking and larger transient vessels and expanding the new marina basin to the west to focus more on seasonal vessels.

Parking and Circulation

The proposed expansion plan maintains the reconfigured boat launch circulation area to improve turning movements while providing access to a new single lane service boat launch oriented south within the new seasonal marina basin. The existing boat launch will remain in use as the primary boat launch for recreational vessels and special events. The existing parking area at the east end of the site is reoriented, with a portion of the lot converted to public green space for improved views and support for special events.

Pedestrian circulation paths along the edges of all green spaces provide safer, more direct access to the waterfront area.

Boater Services Building

The plan proposes to relocate boater services, restrooms, and marina offices to the renovated Neal Residence home and garage with a new covered pavilion/restroom structure in the location of the current boater services facility. The new boater services facilities in the renovated garage and home will include dedicated restroom and shower facilities, laundry, boater lounge, harbor master office, and utility/storage areas. The facility will be fully code compliant and meet all modern MDNR standards.

Utilities

As in the prior Concept Master Plan, all site infrastructure will be improved, with all new potable water and electrical utilities will be provided throughout the upland areas and marina to meet current codes and standards. Ground fault protection will greatly reduce the risk of Electric Shock Drowning, and electrical capacity at each slip will be increased to meet current and anticipated growth in demand. Consideration should be given to adding individual electrical metering to each pedestal, which has been shown to decrease energy usage by more than 30%. Power and potable water should be added to all



seasonal and transient docks facilities, with basic maintenance power provided on the docks within the Courtesy Day Dock basin.

As part of the overhaul of utilities, the pump-out system will be replaced with a new point of service unit. Wi-Fi services are proposed to be enhanced to provide high speed Wi-Fi at each slip through a third party vendor. An improved potable water supply system should be considered, along with a more flexible upland electrical system to support outdoor festival activities.

The overall site lighting system should be overhauled to eliminate the taller pole mounted lights and replace them with dark sky compliant low level bollard lighting, which will reduce energy costs, improve navigational safety, and protect the views of the night sky from unnecessary light pollution.

Marina Layout

Hessel Marina Basin

The proposed configuration of the marina will be organized into the new main Hessel Marina Basin to the west, and the new Courtesy Day Dock and transient facilities within the existing basin to the east. Within the existing Hessel Marina Basin to the east, the Fork Dock is proposed to be replaced with a series of finger docks along the north wall. This will take allow the addition of eight new slips ranging in size from 25'-50' in length. Four of the existing finger piers located along the north side of the fixed pier within the existing basin would be removed to create additional protected flexible broadside transient mooring. An ADA compliant floating kayak/paddle craft launch dock is located near the accessible parking area.

The central floating dock will be expanded to the east to increase the total number of slips to 20. If practical, modern potable water and marine electrical systems should be added to this dock system, and consideration given to extending the length of the gangway to achieve ADA compliance in a wider range of water levels.

Consideration should be given to the fact that nearly all of the existing floating dock infrastructure in the main basin were constructed and installed in the early 1990s and are now thirty years old or more. While they are generally in very good condition for their age, floating docks of this type typically have a useful life expectancy of 25-30 years. This suggests that at some point over the next ten years or so, these docks will likely need to be replaced. While adding power and water utilities to the main floating pier is highly desirable, the cost to install those systems on docks with a relatively short lifespan remaining may be cost prohibitive.

Outer Fixed Pier and Broadside Mooring

The elevation of the outer fixed pier is estimated to be LWD +5.5, which is less than one foot above record high water level for Lake Huron. With the need to install new utilities and correct the settling pavement, we recommend raising the elevation of the outer fixed pier to at least LWD +6 or +6.5. We



also recommend the installation of an improved timber fendering system, both along the face of the steel sheet pile wall and including more robust vertical fenders to accommodate larger ferry or superyacht vessels.

In all cases, we recommend separating the marina utility systems from the vertical fenders as damage to the fender puts the utility system at risk.

New West Basin

The new seasonal docks are located within a new basin to the west of the existing facility, formed by a heavy timber floating dock system similar to that installed at EJ Mertaugh Boat Works. The new timber floating dock system is connected to land by two ADA compliant aluminum gangways. The dock system extends to the south approximately 350', and then extends eastward approximately 300' to form a protected inner basin. Mooring space for up to fourteen 25' island day docks and thirty-one 35' seasonal slips are provided, with approximately 300 linear feet of flexible broadside mooring within the new basin.

The east wall of the Seasonal Dock basin will be improved from the existing mix of armor stone revetment and steel sheet pile to all sheet pile with timber fendering to facilitate additional staging and transient boating.

Expanded Concept Master Plan

Eighteen (18) 25' slips:	450lf
Twelve (12) 30' slips:	360lf
Thirty-one (31) 35' slips:	1,085lf
Ten (10) 40' slips:	400lf
Four (4) 45' slips:	180lf
Two (2) 50' slips:	100lf
Flexible Broadside:	900lf



PHASE I					
	Work Items	Units	Qty	Unit Price	Total Price
1.0	<i>General</i>				
1.1	Mobilization & General Conditions	LS	1	\$143,000	\$143,000
2.0	<i>Site Work & Shore Facilities</i>				
2.1	Demo Main Asphalt Parking	SF	9600	\$4	\$38,400
2.2	New Main Asphalt Parking	SF	16100	\$8	\$128,800
2.3	Demo Eastern Asphalt Parking	SF	7350	\$4	\$29,400
2.4	New Eastern Asphalt Parking	SF	3025	\$8	\$24,200
2.5	Landscape Half of Eastern Parking	SF	4400	\$6	\$26,400
2.6	Demo Concrete Sidewalk	SF	4500	\$5	\$22,500
2.7	New Concrete Sidewalk	SF	11750	\$10	\$117,500
2.8	Demo Building	SF	1400	\$10.00	\$14,000
2.9	Landscaping	SF	22500	\$6	\$135,000
2.10	Gazebo Replacement	SF	315	\$75	\$23,625
2.11	Pavillion/Restroom	SF	700	\$350	\$245,000
3.0	<i>Contractor Boat Launch</i>				
3.1	Relocate Rip Rap	LS	1	\$10,000	\$10,000
3.2	CIP Concrete Paving	SF	1200	\$20	\$24,000
3.3	Sheet Pile Bulkheads	LF	80	\$1,500	\$120,000
4.0	<i>Dredging</i>				
4.1	Dredging*	CY	3000	\$50	\$150,000
5.0	<i>Northern Finger Piers</i>				
5.1	Demo Existing Finger Piers	LS	1	\$3,500	\$3,500
5.2	Finger Piers	SF	380	\$100	\$38,000
5.3	Marine Plumbing	/SLIP	6	\$800	\$4,800
5.4	Marine Electrical	/SLIP	6	\$8,000	\$48,000
5.5	Kayak Launch	LS	1	\$45,000	\$45,000



6.0	<i>Central Floating Piers</i>				
6.1	Lengthen Pier & Add Fingers	SF	0	\$75	\$0
6.2	Marine Plumbing	/SLIP	0	\$800	\$0
6.3	Marine Electrical	/SLIP	16	\$4,000	\$64,000
7.0	<i>Existing Southern Crib Pier</i>				
7.1	Demo Concrete Decking	SF	5200	\$10	\$52,000
7.2	Demo Finger Piers	LS	1	\$4,000	\$4,000
7.3	New Concrete Decking	SF	5200	\$20	\$104,000
7.4	Replacement Finger Piers	SF	360	\$100	\$36,000
7.5	Replacement Slip Utilities	LS	1	\$150,000	\$150,000
7.6	Sanitary Pumpout	LS	1	\$50,000	\$50,000
7.7	Timber Fendering	LF	460	\$150	\$69,000
8.0	<i>Floating West Pier</i>				
8.1	60' ADA Gangway	EA	1	\$40,000	\$40,000
8.2	Gangway Abutment	LS	1	\$110,000	\$110,000
8.3	Floating Dock & Fingers	SF	5800	\$80	\$464,000
8.4	Marine Electrical	/SLIP	17	\$8,000	\$136,000
8.5	Marine Plumbing	/SLIP	17	\$800	\$14,000
9.0	<i>Shoreline Protection</i>				
9.1	Armor Stone and SSP Protection	LF	320	\$1,750	\$560,000
9.2	Phase 2 Abutment	LF	80	\$1,500	\$120,000
				Subtotal	\$3,364,125
				20% Contingency	\$673,000
				Total	\$4,037,125



PHASE 2					
	Work Items	Units	Qty	Unit Price	Total Price
<i>1.0</i>	<i>General</i>				
1.1	Mobilization & General Conditions	LS	1	\$39,000	\$39,000
<i>2.0</i>	<i>Floating Dock off of South Fixed Pier</i>				
2.1	Floating Dock & Floating Fingers	SF	3480	\$80	\$278,400
2.2	60' ADA Gangway	EA	1	\$40,000	\$40,000
2.3	Marine Plumbing	/SLIP	28	\$800	\$22,400
2.4	Marine Electrical	/SLIP	28	\$8,000	\$224,000
<i>3.0</i>	<i>Courtesy Dock Upgrades</i>				
3.1	Floating Dock System Elongation	SF	880	\$80	\$70,400
3.2	Marine Plumbing	/SLIP	0	\$800	\$0
3.3	Marine Electrical	/SLIP	4	\$4,000	\$16,000
Subtotal					\$690,200
20% Contingency					\$138,000
Total					\$828,200

NEAL RESIDENCE RENOVATIONS					
	Work Items	Units	Qty	Unit Price	Total Price
<i>1.0</i>	<i>General</i>				
1.1	Mobilization & General Conditions	LS	1	\$48,000	\$48,000
<i>2.0</i>	<i>Garage</i>				
2.1	Renovation of Garage to Boater Restroom	LS	1	\$250,000	\$250,000
<i>3.0</i>	<i>Residence</i>				
3.1	Boater Services First Floor	LS	1	\$350,000	\$350,000
3.2	Boater Services Second Floor	LS	1	\$200,000	\$200,000
Subtotal					\$848,000
20% Contingency					\$170,000
Total					\$1,018,000





IMPLEMENTATION and FUNDING STRATEGIES

We suggest the following strategies that have been utilized successfully many times be considered to offset construction costs, including:

- Apply for USFWS Boating Infrastructure Grant Funding of up to \$1.5 million. This project is an excellent candidate for this program due to the very high quality of the destination.
- Apply for Clean Vessel Act grant funding for the proposed pump-out facilities, which would cover the \$30,000-45,000 cost of new pump-out infrastructure. This grant is one of the easiest to obtain grants for marina facilities.

While the strategies outlined above will cover a large part of the total cost of construction if implemented, additional strategies for consideration include:

- Consider value engineering strategies to reduce the overall cost of the proposed plan during preliminary engineering phases
- Consider breaking the project down into smaller phases
- Consider additional grant funding sources including:
 - MDNR Waterways Program Funding
 - Michigan Natural Resources Trust Fund (MNRTF) construction funds
 - Coastal Zone Management (CZM) program grant funding
 - Michigan Economic Development Corporation (MEDC) grant funding



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