The Shiawassee River Ramp-Based Paddle Craft Launch Concept

By: Phil Hathaway, Shiawassee River Water Trail Coalition, March, 2019

Introduction. What is offered here may apply to many settings along southern Michigan waterways where bank shapes approximate 90 degree angles making it difficult to simply unload a load of gravel and establish a carry-in paddle craft launch. A ramp-based system resolves this issue and is not overly complicated; moreover, it is affordable compared to more complex launch designs. The ramps are not intended to hold vehicular traffic, although the ramp design could withstand backing a light boat trailer onto it—but not the tow vehicle.

An early decision is about barrier-free accommodations. None of these ramps, except for the complying slope angles and designated parking spaces, offer such assistance with respect to entering or exiting watercraft. Those devices are entirely different manufactured facilities that cost around $40,000, and; because our river has periodic swift currents, there needs to be a similar facility downstream. With Corunna's installation due in the fall of 2019, there is now an adopted plan in place for at least one tandem facility 45 minutes downstream in Owosso. Unless a funding source (or other oversight authority) requires barrier free assistance, it has been determined that barrier free devices are optional.

This ramp concept has already been constructed at seven locations on the Shiawassee River in Shiawassee County. They are all located on public properties of local municipalities where their insurance policies cover any incidents that may occur from use of these facilities. Installers and landowners should exercise their own judgment on the relative safety and utility of this facility concept at any particular location.

Time records for the constructed facilities show there are about 100 lead-time hours of administrative, fund raising, material ordering, design and permitting work. Construction involves about 6 hours depending on local conditions and does not include the time for parking systems or signs where necessary or desired. In any year, the lead-time work spans February through June. After materials assembly and permits, construction takes place on a day in lower flow in late August thru October.

Phase I: Conceptual work and local approvals.

It is assumed that the interested parties have identified desired launch facilities on a water trail. In April of any year for construction, site evaluations are conducted with an engineer (volunteered in the Shiawassee example) and assistant to measure the necessary embankment work, ramp extent, low-flow to high-flow determination, and end-grade of the ramp slope. In-river probes to "hard" material are completed to determine the extent of desired mucky material removal by heavy equipment on

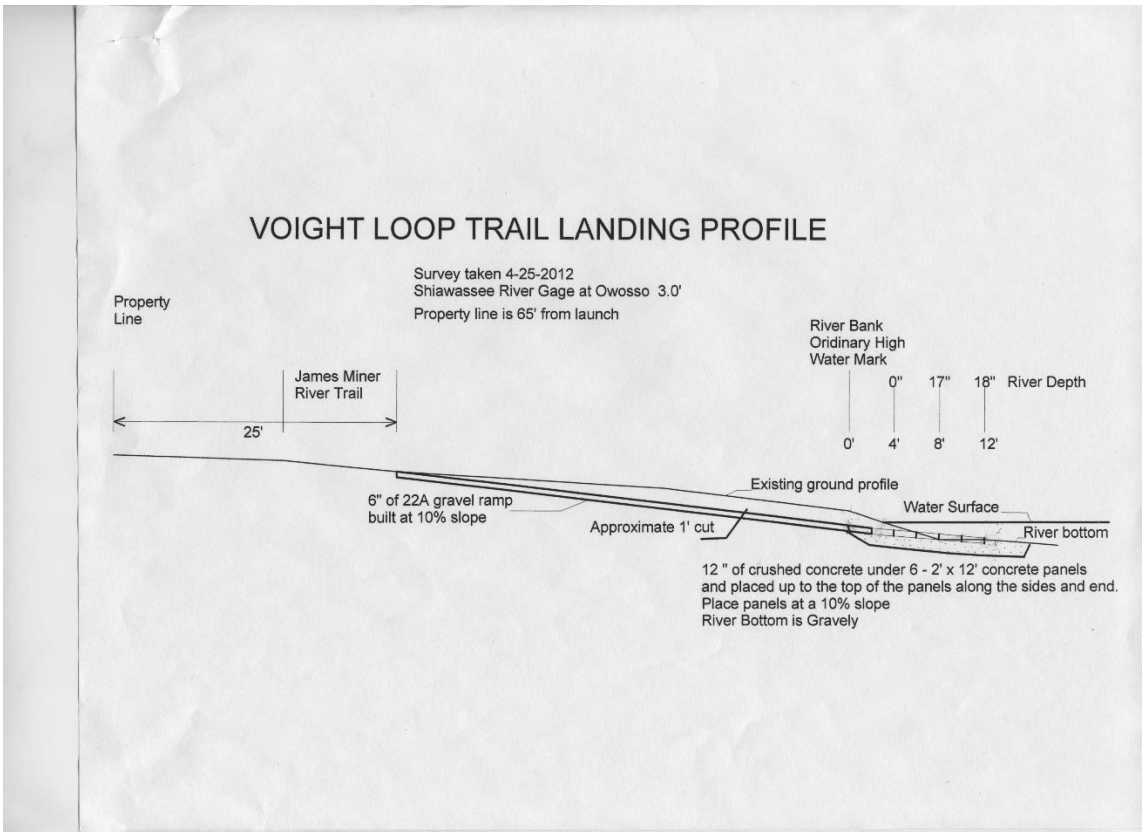
construction day. A preliminary design (cross-section and plan view) and a site plan for available or proposed parking and walkway approaches are completed.

The landowner, usually a public entity or private party offering an easement, reviews plans, makes necessary amendments, and approves the project to proceed. An early decision is made as to who controls the project implementation thereafter. A ramp construction team exists in Shiawassee County to supplement municipal staff, although the next two scheduled ramps on the water trail will be engineered and constructed through a city staff and its contractors. With respect to the construction team approach, the landowner, in prior projects, has appointed a staff person to join the team to oversee the project on their behalf.

There are always other site specific details that every launch presents that are managed at this phase of project development.

Phase II. Project design, materials/cost estimates, permitting & funding.

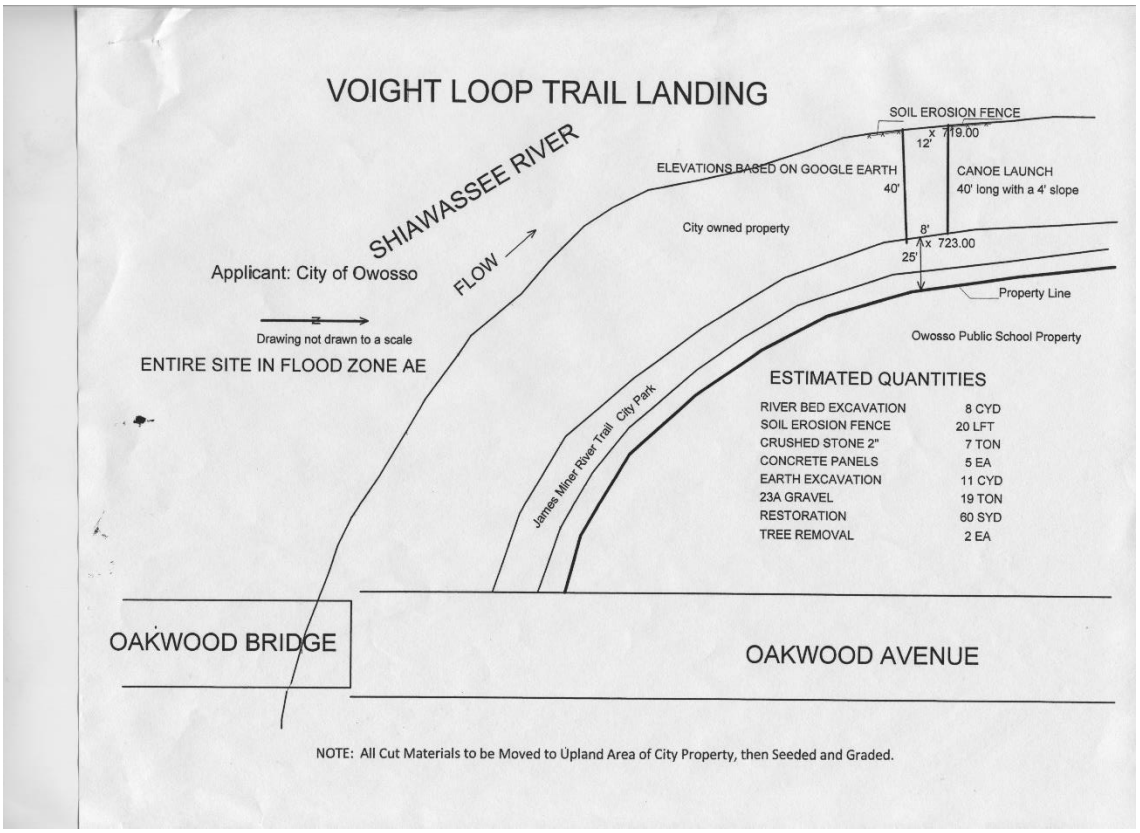
The cross-section and plan-view designs below offer an image of how basic the engineering drawings may be to achieve permitting and materials estimating.



This is a cross-sectional view that offers much of what the MDEQ wants to see in its MiWaters permit document (aka “Inland Lakes and Streams”). The permit places a high emphasis on revealing any filling of a floodplain or adverse effect on a wetland. In 2019

the permit is now digital. Expect to pay $500 for the MDEQ permit and plan on a 60-day review. Submit no later than mid-June for a late summer/early fall completion schedule.

The second rendering offers materials quantities from which cost estimating can be accomplished. The Plan-view below is for the same facility. This view is also required for the MDEQ permit and for a County's Soil Erosion and Sedimentation Permit for work within 500 feet of a water body. For the County's oversight, soil erosion fences are the minimum expectation, together with abating siltation effect during construction.



If in Shiawassee County, expect to pay a $100-$200 fee for the County's Soil Erosion and Sedimentation Permit. That permit application may be submitted a few weeks before construction, but earlier is better for projected issues with erosion control.

One design feature unique to the ramps is the "articulating" concrete panel. The panels are 12 feet in length, 7 inches thick and 2 feet wide. Each has a pair of ¾" holes aligning with other panels in order to string 3/8" stainless steel cables (with clamps at the ends) through the panels as they are put in place. Although each panel weighs a ton, the cables prevent any lateral slippage of panels away from each other and still allow seasonal frost heave movement (articulation). In fair weather the panels settle into place and are unaffected by frost heave in the Shiawassee experience. The most recent panel price from a local concrete firm was $180 apiece that includes a discount for a donation to the project. Otherwise, expect to pay $200+ per panel.

The panels are custom-designed by an Owosso firm to withstand cracking and absorb weight loading. The mix ingredient and the rebar placement—for which the design received MDOT concrete specialist and engineer collaboration with the concrete firm--distinguish these panels. See the photograph below in the process of placement.

Note the built-in clamp panel insets for lifting the panels. Also note the base material about 1 foot thick of 1-3" crushed limestone or crushed concrete placed over a layer of geotextile fabric. The 2x4's are used to screet the crushed stone level underneath each panel prior to placement—a crew of 4 to 5 volunteers on their knees do this work in short order. This launch at the Village of Byron placed 10 panels (8-to-10 are preferred). The stainless steel cable is seen on the ground right of the first panel. Also note the panels have a tongue-and-groove design on to enable a tighter bond. The panel surface is brushed during curing at the concrete plant to avoid users' slip and falls. The concrete firm removes any burrs on the cured concrete prior to pick-up.

The ramp area, where heavy equipment operates, does not use panels for the balance of the incline approach. In their place, 23a crushed limestone is used. It is a very stable, flood resistant material that becomes a very hard surface, almost cementitious, upon exposure to moisture. It rarely erodes or experiences ruts as happens with gravel fill. Level grade walkway approaches may be constructed with gravel, but are subject to weed growth without maintenance or weed barriers. In some locations yearly removal of silt deposits on the panels (from high water with suspended solids) may be required.

For materials pricing, the numbers cited here are not adjusted for inflation or time and represent what they cost anywhere from 2-to-6 years ago. The concrete panels should be ordered in June of a construction year to have them properly cured for late August construction. Other materials are ordered/assembled a few weeks in advance of construction.

Materials Cost List:

1) Stainless Steel Cable (e.g., Fastenal) per lineal foot $6.50

Note: order an extra foot per side (a pair) beyond the assembled panel width; e.g., for 8 panels order 17 and ½ to 18 feet per side. Supplier cuts the cables at the store. Four stainless steel clamps for the cable ends are included in the price estimate.

2) Geotextile fabric under the stone base material $100
3) Silt fence, seed, and straw on disturbed areas $100
4) 23a gravel for walkways and parking ($ per ton) $10.00
5) 23 a crushed limestone for balance of ramp to level ground ($ per ton) $25.00
6) 1-3" crushed concrete, no rebar pieces ($ per ton), $16-$25, or…
7) 1-3" crushed limestone ($ per ton) $28-$35

To prepare for financing, other costs to consider are:

1) Engineering (donated in the Shiawassee example) $500-$2,000
2) Heavy Equipment (50% of actual) for ramp only includes pick-up and delivery of concrete panels $3,000
3) Permits (MDEQ & County) $650
4) Signs (2 roadside, 1 landing, & 1 information) $1,000

Other donated:

1) Professional administration duties (valued at $50/hr) $1,300
2) Volunteer Labor (valued at $22.00/hr) $1,200

Funding sources are varied per project and include the following options:

a. MDNR Passport Grant, and MDNR Land and Water Trust Fund Grant
b. MDNR Natural Resources Conservation Fund Grant
c. Foundation matching grants
d. Site owner contribution or matching value of staff efforts
e. Volunteer professionals match (administrators, engineers)
f. Volunteer labor, material and equipment match
g. Philanthropic, corporate, and donation campaigns

Matching funds (e, f, & g) are included in the list to offset reliance on limited local cash.

Conclusion. The eight paddle craft ramps without parking lots were constructed with a cash total of $3,000 to $6,000 per ramp. Matching funds usually are two times or more the cash requirement. With parking, the ramps can rise to the $20,000 cost level (cash + match). The next page has photos of 6 of the 9 launches built since 2013 (seven are ramp systems; the other two are a wood dock at the DeVries Natured Conservancy and a concrete platform step style at Owosso's Harmon Patridge Park).

PHOTO PAGE OF SELECTED CONCRETE RAMP LAUNCHES

Oakwood Landing (Voight Loop Park)

Geeck Road County Park

Henderson Park (fall leaf cover)

Shiatown County Park

Byron Launch, Crew & Excavator

Vernon Launch Downstream View