

Appendix G



Carlyle Sailing Association

Eldon Hazlet State Park, 20960 Hazlet Park Road, Carlyle IL 62231

Harbor Facility Flood Remediation



Prepared by
CSA Facility Restoration Planning and Engineering

October, 2016

Facility Flood Remediation Project

Executive summary

- Carlyle Sailing Association (CSA) is an Illinois Not-For-Profit Corporation located in Hazlet State Park on Carlyle Lake
- CSA's mission is to provide the finest inland lake sailing facility in the Midwest emphasizing sail training and water safety in addition to racing and cruising.
- CSA's asphalt parking lot for boats and cars is more than 40 years old, is in very poor condition, and is well beyond its useful life.
- Frequent flooding of Carlyle Lake has severely damaged the lot and reduced the number of days the facility is available for activities.
- It is proposed that
 - Car and boat parking areas be raised to the elevation of at least 454 feet to reduce flooding.
 - All asphalt parking areas be resurfaced.
- Benefits
 - Reduction in the number of days the facility is closed due to flooding thus increasing the recreational and economic impact for the region.
 - Protection of assets (the asphalt lot).
 - Enhance the USACE and IDNR mission of providing affordable, high quality recreational facilities with low operational costs.
- ROM cost of project: \$2,275,676 (see attachment).

Background

Carlyle Sailing Association(CSA) is an Illinois Not-For-Profit Corporation, located in Hazlet State Park on Carlyle Lake. CSA has been a lessee from Illinois Department of Natural Resources (IDNR) since 1971. The mission of CSA is to provide the finest inland lake sailing facility in the Midwest to the sailing public .

CSA has performed fund-raising through its support of annual sailing regattas like the Leukemia Cup and Sailing for Veterans, which have raised hundreds of thousands of dollars for charity. This facility continues to be the site of regional and national championship regattas on a regular basis, which draw hundreds of participants to Carlyle Lake, and provide national media attention. In 1976, CSA gained such attention when the United States Sailing Association held its Championship of Champions regatta at CSA, which was repeated in 1993 and 2009. In 1994, it was the site of the Olympic Festival of Sailing, which was a primary development vehicle for U.S. Olympic sailing teams. This event drew over 4,000 spectators. Over the years CSA regattas have drawn competitors and guests from all over the world.

CSA has the capability to host 300 annual user boats, but this number has declined to around 150 recently because of the frequent flooding. There are hundreds of seasonal users, family and visitors who enjoy casual sailing and sail racing. These sailors are drawn to Carlyle by the excellent venue the lake offers and the facility that CSA provides through its mostly volunteer officers and committees. Its annual users come from Illinois, Indiana and Missouri. Also, the facility is open to the public on a daily fee basis, and sailboats are available for rent. Various annual user arrangements are available on a yearly basis. CSA's activities have a substantial economic impact on the park operations and at the local level in Carlyle and Clinton County.

CSA FACILITIES

In 1971, the Directors of CSA and the Hurst-Roche design team hired by IDNR created the basic layout of the harbor facility. The original facilities provided by IDNR were limited to a boat and car parking lot of asphalt, lighting and three jib crane hoists. Portable privies, a house trailer and utility shed were provided

by CSA. Since then CSA's members have spent many thousands of man-hours, and has invested in excess of \$20,000 per year for the last 45 years of its own funds in buildings and improvements to maintain the quality of this concession. Among these are a pavilion structure providing shelter for picnic tables for dining, a home and office for a harbormaster, an observation building to provide an indoor site for protection from the elements and a venue for regatta events and training, and a storage barn.



CSA at normal lake stage

Throughout its existence, the annual users of CSA have contributed volunteer man-hours to make improvements within their skill levels. Maintenance has usually been done by them except when special skills are required such as electrical, roofing, building, etc. Today the property and buildings at CSA are, thanks to the commitment of the users and its board of directors, sound and adequate to carry on the programs of CSA. Sadly, however, its asphalt parking lots are not.

THE NEED FOR HIGH WATER IMPROVEMENTS

Carlyle Lake is a United States Corps of Engineers (USACE) multiuse project including flood control and recreation. Each year the level of the lake fluctuates as a result of the flood control determinations made by St. Louis District Water Control.

The CSA harbor facility was established by IDNR at an elevation of 450' NVGD based on the direction of USACE studies, which concluded that water levels would not rise above that level more than once per 100 years. This was based on a maximum non-damaging release rate at Carlyle of 7000 cfs. This flow rate was changed to 4000 cfs after CSA was in operation because the intended levees below Carlyle, included in the original watershed plan, were not built. By then CSA was already in place.



Because of this change, the water has been at damaging levels above 450 NVDG for 408 days in the last ten years alone. 306 of these days occurred during the recreation season causing loss of user revenue in addition to facility damage. These are occurring with increasing frequency, with three major events in the

last 5 years, losing a total of over 200 recreation days. In its five-year plan, IDNR has recognized the need for high-water improvements at CSA.

Both IDNR and CSA agree that the condition of the asphalt on the surface roads and parking lots (boats and cars) is in need of repair and replacement. The CSA lease provides:

"IDNR acknowledges that the asphalt on the surface roads and parking lots is in need of repair and replacement and that the useful life of the asphalt on the boat parking lot has already been exceeded. Pursuant to Section 13 hereof, IDNR shall make a good faith effort to repair and/or replace the boat parking lot to a like-new condition as quickly as practicable and will include such work in future appropriations, if possible" Lease p. 9, Para. 7 (a)."

USACE bears some responsibility in this situation as flooding has a direct impact on the life of the asphalt and is a major cause of its deterioration. Flooding causes changes in pressure above and below the asphalt and accelerates the deterioration of the asphalt compound by deposits of mud that leach throughout the asphalt over time. Consequently, the binder, which holds the gravel that makes up the asphalt, is washed out and cracking begins through and through. Eventually whole sections become weakened and begin to break up.

The deterioration of the asphalt is evident in any visual inspection of the facility. The growth of grass and weeds is an indicator of the large number of cracks that have developed over the years as the result of age and flooding.



The lots have been asphalted only twice in the last 43 years; the last time was just before the 1994 Olympic Festival when a 2" overlay was made. CSA has from time to time tried to seal the cracks and maintain the lot, but the deterioration now is to a point that such efforts are a waste of time and money. The lots need to be replaced.

In its lease, with the Corps, IDNR has outlined a required list of improvements. As to the CSA facility, that plan recognizes that elevation of the facility is a necessary improvement to reduce frequent flooding. It provides for "elevating the catamaran parking lot and existing facilities to elevation 454." CSAs goal is to make that a reality. Then in the future, those who use the facility can count on a reliable and full sailing season, and CSA will continue to be a successful and attractive draw to Hazlet State Park.



THE IMPACT OF FLOODING ON CSA

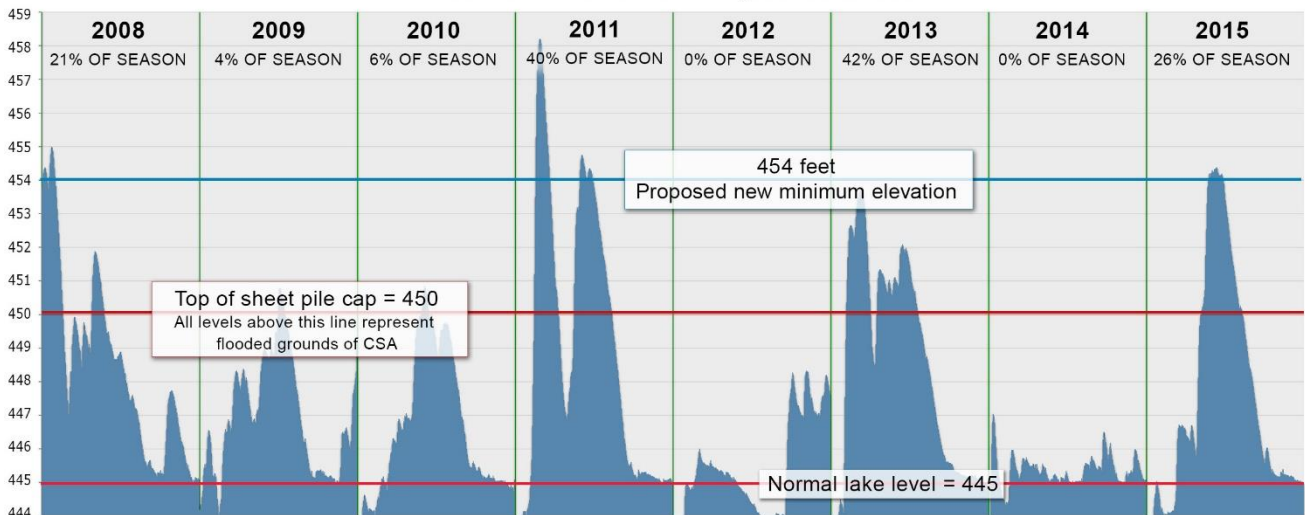
CSA at 2011 flood crest

At CSA, all sailboats are stored on trailers, which are in turn parked on the lower portion of its lot, known simply as the sailboat parking lot. Smaller craft are then launched into the harbor via three jib cranes from the trailers into the water where they are then tied to a dock. There are no permanent in-water boat docks at which boats are moored. Boats are typically launched and retrieved on the same day. Some larger cabin boats are launched from their trailers via concrete boat ramps into the water. Very light boats such as catamarans are launched from a lower grass field from lightweight dollies. The catamaran field is usually the first to feel the effect of flooding as it is lower than 450' and has no elevated protection such as a sea wall.

Water on the CSA lot and catamaran field has a direct impact on CSA's ability to conduct sailing operations. The chart below shows the large number of lost days recent years caused by flooding.

Daily lake levels during the sailing seasons, 2008 - 2015

Percent of season with CSA grounds flooded



The flooding of the CSA lot begins when the lake elevation passes 450 ft NVDG. The above chart shows the annual flooding above the regular lake pool height of 445' NVDG (see the lowest red line). The water is on the CSA lot when the level of the pool is above 450' NVDG. (See the upper red line). As the chart shows, in four of the last eight years, CSA has lost a large number of recreation days due to flooding.

During flood events, CSA cannot conduct sailing activities during one of the prime times of its season when wind and cooler weather create ideal sailing conditions. Users, many of whom travel an hour or more, stop coming to Carlyle. Some have not renewed their CSA contracts, specifically referring to the problem of flooding. In 2016, CSA witnessed its worst membership drop in its forty five-year history.

In the spring of 2015, floodwater again covered the boat parking lot and halted sailing activity. Water levels were above 450' NVDG for 56 days during the 2015 sailing season: a loss of 26% of our seasonal days.

The so-called Christmas Flood of 2015 was caused by the 4th highest inflow to the lake with 53,250 dsf recorded on Dec. 28. On Dec. 29, the water topped 450' NVDG and by Dec. 31, it reached a high of 458.7' NVDG completely flooding CSA property.



As of Jan. 23, 2016, the water was still flooding CSA at 455' and is projected to be above 450' until well into March, 2016. This flood, along with freezing temperatures will result in damage to property and equipment. The cost to clean up from this extraordinary event in terms of money and man-hours of work is expected to exceed \$20,000. The loss in user fees in 2016 is, as yet, unknown.

In addition to cleanup and damage costs, some sailors are not renewing their annual contracts because CSAs operation is closed for the first two to three months of the season whenever flooding occurs. Walking through 2 to 4 feet of water, mud and muck is a health and safety risk to the sailors. The organization relies on volunteers to clean the wood, slime and debris, plus make repairs after the water recedes. Thus, flooding creates a real negative impact on the ability of CSA to attract and retain annual users.

Financial losses from the other events averaged: \$11,500 for cleanup repairs and labor and lost user and activity fees of \$15,400 per occurrence. It may be noted that the total amount is around 25% of average annual income. Also, several large regattas had to be cancelled because of flooding in recent years.

Corrective action is a must to reverse the trend. The evidence and history prove that these floods will occur more frequently than ever. The impact on CSA will continue to grow and its ability to survive will be challenged. Money spent on repairing flood damage to structures, electrical equipment and grounds is money lost to providing a sailing venue that attracts rather than discourages public participation. CSA is managing to date, but this loss rate plus the continual deterioration of facilities from the flooding cannot be sustained for the long term without IDNR and USACE assistance.

PROPOSED SOLUTION

After an extensive engineering study commissioned by CSA, the most cost effective solution for long-term preservation of the CSA mission and facility is to elevate both the boat parking lot and re-slope the catamaran field. This will reduce the number of days lost to flooding and extend the life of the parking lot.

As indicated in the chart above, raising the minimum elevation approximately four feet would essentially guarantee that CSA would be high and dry during most floods. The parking lots would be flooded far less frequently and the life span of the asphalt would be greatly increased.

This improvement would insure that the world-class facility that CSA and IDNR have created would be maintained well into the future.

BENEFITS

By making the proposed improvements:

- The impact of flooding on CSA activities will be greatly reduced. Viewing statistics from the past eight years, had the lots been at a minimum elevation of 454' NVDG, the number of sailing season days lost to flooding will have gone from 297 down to 74, which will translate into 223 days that anywhere from 50 to 200 more people will have come to Carlyle Lake.
- CSA is not as affected by flooding and can attract more users and large regattas.
- The parking lot is safer and is more attractive to potential guests.
- The maintenance burden on CSA users is greatly reduced.
- Assets of the facility owned by USACE and IDNR are better protected.
- Enhancement of mission, providing safe, affordable, high quality recreational facilities with low costs.

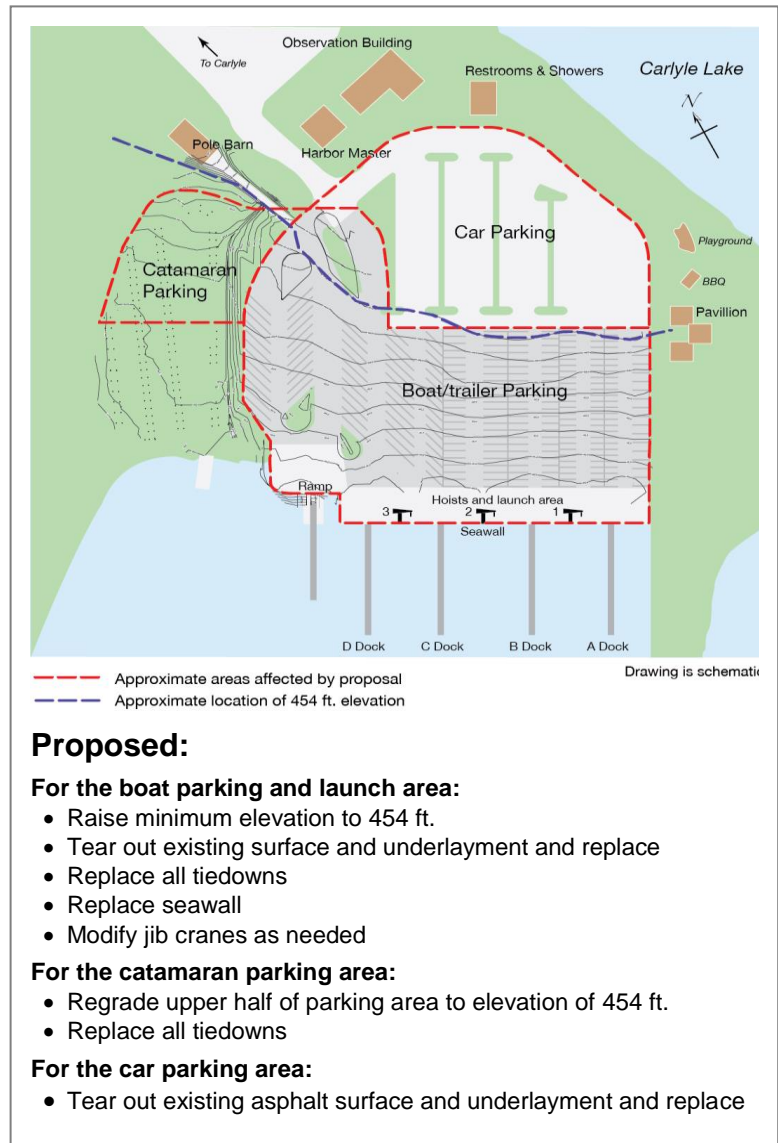
COST OF CORRECTIVE ACTION

CSA has engaged the skill and experience of a registered engineer, Tom Baker formerly the president of Hurst-Roche Engineers Inc. (the original facility designer), to evaluate the project cost. The resulting ROM estimate for the total cost is \$2,275,676 (2014 dollars). A subsequent 2016 IDNR estimate is \$3.58 million, which includes the improvements outlined above plus engineering surveys, design, electrical work and contingency. The costed statement of work performed by CSA in 2014 dollars follows.

Prepared by Thomas G. Baker, P.E. 1-27-2014

PROJECT: Harbor Facility Flood Remediation

PREPARED: TGB **DATE:** 1/27/14



CLIENT: Carlyle Saling Association

CHECKED:

DATE:

COST ESTIMATE

<u>Item</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Extension</u>
<u>DIVISION 2 - SITEWORK</u>				
ONE-DESIGN PARKING AREA				
Remove / Replace Tie-Downs	Each	360	\$125.00	\$45,000.00
Adjust Manholes & Repair Screen @ Existing Seawall	Each	3	\$2,500.00	\$7,500.00
Add Manholes (3) and Storm Sewer (500Feet)	LF	500	\$125.00	\$62,500.00
Remove Seawall Cap, Hoists, Electrical & Water	Hours	40	\$250.00	\$10,000.00
Scarify existng Parking Area	SY	13,889	\$1.25	\$17,361.11
Adjust height of Hoist Foundations + New Chains	Each	3	\$4,500.00	\$13,500.00
Install Sheet Pile (456 + 290 by 30) x 22 PSF, Inclds Deadmen	Tons	100	\$1,800.00	\$180,000.00
Tiebacks, wall cap, ladders and Misc Metals	Tons	15	\$1,400.00	\$21,000.00
Geotextile Fabric	SY	13,889	\$1.75	\$24,305.75
Compacted Backfill to Elevation 454	CY	15,000	\$14.00	\$210,000.00
Add CA 6 Base Repair Area @ Sea Wall	Tons	600	\$28.00	\$16,800.00
Bituminous Prime Tack Coat	Gallons	875	\$6.05	\$5,293.75
Bituminous Base Coarse 3"	Tons	2,109	\$120.00	\$253,125.00
Bituminous Surface Course 2"	Tons	1,458	\$135.00	\$196,875.00
Striping	LF	6,000	\$0.63	\$3,780.00
Mobilization and Demobilization	LS		\$25,000.00	\$25,000.00
Embankment to elevation 454 Along Easterly Edge	CY	600	\$14.00	\$8,400.00
Bituminous Seal Coat	SY	13,889	\$2.65	\$36,805.56
Seeding and Pavement Repair	LS		\$25,000.00	\$25,000.00
Contingency @ 10%	LS		\$113,724.62	\$113,724.62
Total One-Design Parking Area				\$1,275,970.78
CABIN-BOAT PARKING AREA				
Mill and Remove Existing Surface (2") 23,000 SF	SY	2,556	\$3.50	\$8,944.44
Survey and Establish Grade (Crew)	Hours	8	\$225.00	\$1,800.00
Add CA 6 (3") Sub-grade to Base Repair Area @ 35 %	Tons	126	\$28.00	\$3,521.88
Bituminous Prime Tack Coat	Gallons	282	\$6.05	\$1,704.59
Bituminous Base Coarse Repair, 3" @ 35% Of Area	Tons	136	\$120.00	\$16,301.25
Bituminous Surface Course 2"	Tons	268	\$135.00	\$36,225.00

Striping	LF	1,500	\$0.63	\$945.00
Mobilization and Demobilization	LS		\$3,000.00	\$3,000.00
Hauling Off Site (50 miles Round Trip)	Tons	240	\$18.00	\$4,312.50
Bituminous Seal Coat	SY	2,556	\$2.65	\$6,772.22
Contingency @ 10%	LS		\$8,352.69	\$8,352.69
Total Cabin-Boat Parking Area				\$91,879.57

CAR PARKING AREA

Mill and Remove Existing Surface (2") 85,000 SF	SY	9,444	\$3.50	\$33,055.56
Survey and establish Grade (Crew)	Hours	8	\$225.00	\$1,800.00
Bituminous Seal Coat	SY	9,444	\$2.65	\$25,027.78
Bituminous Surface Course 2"	Tons	992	\$135.00	\$133,875.00
Striping	LF	3,000	\$0.63	\$1,890.00
Mobilization and Demobilization	LS		\$5,000.00	\$5,000.00
Hauling Off Site (50 miles Round Trip)	Tons	885	\$18.00	\$15,937.50
Contingency @ 10%	LS		\$21,658.58	\$21,658.58
Total Car Parking Area				\$238,244.42

CATAMERAN PARKING AREA

Remove Trees	Each	3	\$1,000.00	\$3,000.00
Grubbing & Top Soil Presevation	Acres	5	\$850.00	\$4,250.00
Survey and establish Grade (Crew)	Hours	8	\$225.00	\$1,800.00
On-Site Borrow (20%)	CY	430	\$15.00	\$6,450.00
Off-Site Borrow (80%)	CY	1,720	\$25.00	\$43,000.00
Shape & Compaction	Days	3	\$4,000.00	\$12,000.00
Seeding	Acres	5	\$3,500.00	\$17,500.00
Existing Road Repair	LS		\$25,000.00	\$25,000.00
Mobilization and Demobilization	LS		\$5,000.00	\$5,000.00
Clean up	Days	2	\$1,500.00	\$3,000.00
Contingency @ 10%	LS		\$12,100.00	\$12,100.00
Total Cat Parking Area Site Work				\$133,100.00

DIVISION 15 - MECHANICAL

Replace Waterlines	Hours	24	\$150.00	\$3,600.00
Total Division 15 - Mechanical				\$3,600.00

DIVISION 16 - ELECTRICAL

Remove & Replace Hoist Circuitry	Hours	32	\$200.00	\$6,400.00
Remove & Replace Lighting & Circuitry	Each	2	\$2,000.00	\$4,000.00
Total Division 16 - Electrical				\$10,400.00

COST ESTIMATE SUMMARY ALL PORTIONS

BASE BID

Site work subtotal (Division 2, Site work)	\$1,739,194.77
Site work subtotal (Division 15, Mechanical)	\$3,600.00
Site work subtotal (Division 16, Electrical)	\$10,400.00
Contractors Overhead and Profit @ 18 %	\$315,575.06
Design, Bidding & Material Testing @ 10%	\$206,876.98

TOTAL INCLUDING CONTINGENCY & FEES **\$2,275,646.81**

CONTACT:

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Revision 2. Initial report October 2016.