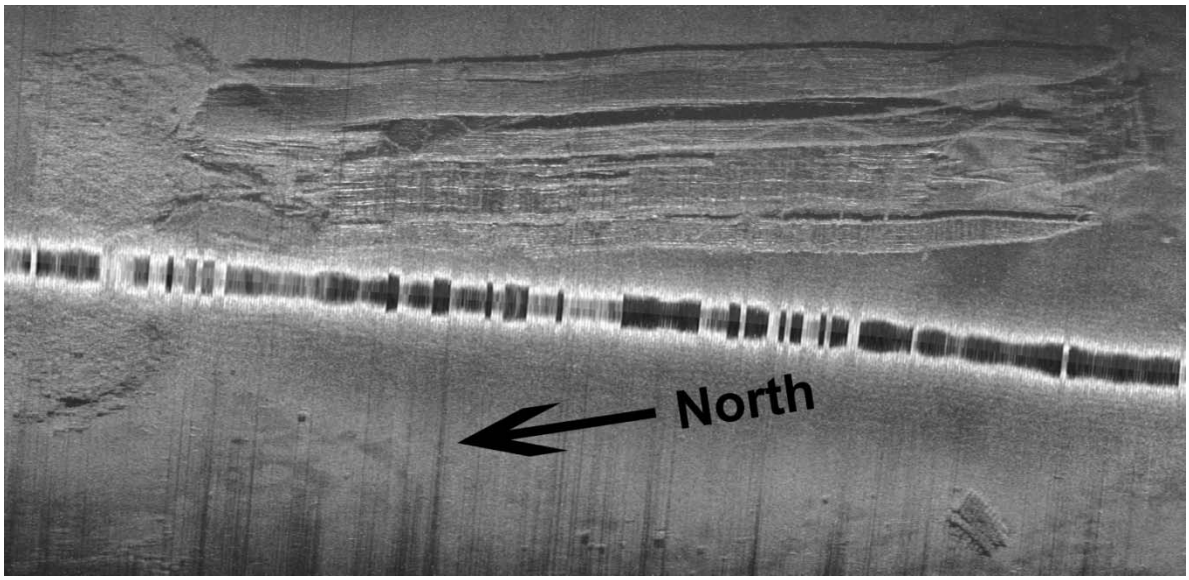
Project Report for the Avocational Archaeological Survey of the Railroad Car Ferry Number 2 (Indiana Site 12La0642)



Submitted in Partial Fulfillment of the Qualifications for NAS II Certification

by

John Loftus, John Bell, Jim Jarecki, Robert Hughes,
Ruth Loftus, John Gerty, and Samuel D. Polonetzky

of the

Underwater Archaeological Society of Chicago

under the supervision of

Dr. Kira E. Kaufmann and Mr. Kevin Cullen

February 2016

Project Report for the Avocational Archaeological Survey of the Railroad Car Ferry Number 2 (Indiana Site 12La0642)

Written in 2015 by John Bell, John and Ruth Loftus, Jim Jarecki, Robert Hughes, John Gerty, and Sam Polonetzky, based on work conducted by themselves and other members and friends of UASC.

Requests for further information concerning this report, including corrections, reprints, or permission to use the contents of this report in whole or in part should be addressed to:

Underwater Archaeological Society of Chicago
P.O. Box 11752
Chicago, IL 60611.

UASC officers may be contacted by sending e-mail to Officers@uaschicago.org, and the UASC web site may be found at http://www.uaschicago.org.

THE UNDERWATER ARCHAEOLOGICAL SOCIETY OF CHICAGO

The Underwater Archaeological Society of Chicago (UASC) is a volunteer, not-for-profit organization dedicated to the study and preservation of Illinois' shipwrecks and other underwater cultural resources.

The UASC conducts shipwreck site surveys which employ field drawings, underwater photography, and video recording. Field survey work is augmented by academic historical research. The UASC attempts to preserve sites by studying the effects of natural and biological forces as well as the impact of human activity on shipwrecks. It advocates responsible use of submerged cultural resources.

Membership is open to everyone. The UASC presents the opportunity to meet, work together, and socialize with others who share similar avocational interests. It allows members to apply their diving or other skills to group projects that produce site maps, published surveys, technical drawings, and educational programs.

The UASC shares the results of its work with the community through publications, museum exhibits, and presentations to interested public and private groups.

Through its work, the UASC hopes to add to the body of archaeological data available to historian and maritime enthusiasts of future generations. It also seeks to enhance the enjoyment and value of local sport diving.

The UASC can be contacted through their web site at http://www.uaschicago.org, or via e-mail to Officers@uaschicago.org

This page intentionally left blank.

Table of Contents

List of Figures

List of Tables

Introduction and Executive Summary

This document presents the results of a long-term avocational archaeological survey of the Railroad Car Ferry Number 2 (aka Car ferry No. 2), located at approximate GPS location 41° 45' north by 87° 25' west in Indiana waters. Car Ferry No. 2 originally capsized in the Chicago Harbor in 1906, and was towed to deeper water in an attempt to salvage her in 1907. When salvage efforts failed, the ship was dynamited to remove obstructions to navigation. Today the ship lies upside-down in approximately 42 feet (ft) of water, with the main wreck site extending approximately 360 ft north-south by 80 ft east-west, with some other debris scattered nearby.

There has been no artifact removal or site disturbance as a result of this survey. Survey techniques employed include the use of sidescan sonar, underwater photography and videography, measurements and survey sketches by free-swimming divers, trilateration, and the placement and use of reference and feature tags. All tags were placed in a non-permanent and non-destructive manner, and may be used for further follow-up studies and/or for educational training purposes.

The work has been performed primarily by avocational underwater archaeologists from the Underwater Archaeological Society of Chicago, under the direction and supervision of Professional Underwater Archaeologists Dr. Kira E. Kaufmann and Kevin Cullen. Field work commenced in July 2006 and was completed the end of August 2014. There was no formal budget, as all labor was performed by volunteers, with costs for boat fuel, etc. being donated by the volunteers and paid for out of pocket as needed.

Project Goals and Objectives

The primary goal of this project was to produce a detailed survey of the Car Ferry No. 2, including site plan drawings, sidescan sonar imagery, photos and video recordings of key features and the overall wreck site, and documentation of any relevant artifacts or special features discovered. Thoroughly documenting the current state of this portion of our national heritage allows for comparison with past studies and establishes a baseline for future work. A secondary goal was for volunteers to apply underwater archeological skills that were learned in part I of the Nautical Archaeological Society (NAS) training program, to demonstrate the mastery of those techniques, and to teach the proper use of those techniques to other volunteers working on the project. An additional benefit of this project is the establishment of a training site for future avocational students of underwater archaeology that will also include continued monitoring for the state of Indiana. All of these major goals have been achieved.

This page intentionally left blank.

Historical Background

Historical Context

In 1906 when the Railroad Car Ferry Number 2 capsized[1]:

- Theodore Roosevelt was President of the United States, having succeeded William McKinley after his assassination in 1901 and winning a full term in 1904.
- The American flag had only 45 stars, as Utah joined the union in 1896. (Oklahoma, Arizona, New Mexico, Alaska, and Hawaii would join between 1908 and 1960.)
- The U.S. Constitution had only 15 amendments (including 10 in the Bill of Rights).
- The U.S. population was less than 100 million people.
- The Civil War had ended, and World War I had not yet begun.
- The Cunard liner RMS Lusitania was launched in Glasgow as the world's largest ship.
- The great San Francisco Earthquake destroyed much of that city, leaving close to 300,000 homeless and doing $350 million in damages.

Specifically in the areas of transportation and steel production:

- The Panama Canal was being built, from 1904 to 1914. (The Erie Canal opened in 1825, providing a direct shipping route from the Atlantic seaports to the Great Lakes.)
- The internal combustion engine was just emerging as a common means of propulsion. The Ford Motor Company was founded in 1903, producing a few Model A cars a day by hand. (The moving assembly line would not be introduced until 1913.) The interstate highway system would not come along for another 50 years, in 1956.
- Several inventors had developed heavier-than-air aircraft, including the Wright Brother's flight at Kitty Hawk in 1903, but air flight was still in its infancy. The first airplane passenger would not fly until 1908, the first commercial flight would not occur until 1914, and Charles Lindbergh would not cross the Atlantic until 1927.
- U.S. Steel was founded by J.P. Morgan in 1901, by purchasing and consolidating holdings from Andrew Carnegie and others. U.S. Steel was the world's largest steel producer for decades, fueled by abundant U.S. iron ore, (especially in northern Michigan), and coal deposits, and demand for railroad rails, bridges, buildings, cars, and other infrastructure.
- J.P. Morgan was also dominant in consolidating and reorganizing the U.S. railroad system. By the end of the 1800s there were over 22,000 passenger locomotives, over 18,000 freight locomotives, and over 24,000 tons of freight shipped per train by rail.

As a result the railroads were the dominant form of transportation in America, particularly for routes where water-borne transport was not available, or for cargo that had to be delivered in a timely manner. Railroads also replaced wagons as the preferred mode of travel for passengers desiring a comfortable ride over long distances.

However marine transport was (and still is) competitive for non-perishable bulk cargo over routes where an adequate waterway was available.

Railroad (Ferry) Operations

By 1906 railroads connected all major cities and destinations in the United States, and were the dominant form of transportation and shipping, particularly for inland destinations. Large cargo ships were still competitive, particularly between the Great Lakes and eastern seaport or overseas destinations for non-perishable bulk cargos such as lumber and ore.

Ferries were also common on the Great Lakes, particularly crossing Lake Michigan to save the time and distance of travelling all the way around the lake (over multiple rail lines and through multiple switching yards). These included railroad car ferries, designed to carry rail cars from one side of the lake to the other.

The Railroad Car Ferry No. 2 was somewhat unusual, however, in three aspects:

1. It ran lengthwise down Lake Michigan, as opposed to crossing the lake east to west.
2. It operated as an unpowered barge pulled by a tugboat, instead of being self-powered.
3. Iron ore could be shipped more economically in a bulk cargo ship than via car ferries.

Let us examine each of these issues in turn:

Why Ferry Rail Cars Parallel to Existing Rail Lines?

This is the major question in the analysis. It is a puzzle as to why they would ship by water in the first place. Rolling the ore cars on and off boats was an extra effort. After all there were three class-one line haul railroads which could more or less connect the iron mines of upper Michigan and Northern Wisconsin to the steel mills at the south end of Lake Michigan. Those being the Chicago & Northwestern (CNW) the Chicago Milwaukee & St. Paul – The Milwaukee Road (MILW) and the Soo Line/Wisconsin Central (SOO/WC). Their routes were very direct. Iron ore is a cargo which is not subject to spoilage; although in winter it was subject to freezing making it difficult to remove from the cars. One would not consider iron ore to be a target of thieves; however, we will explain otherwise.

The first step in our analysis is to find some dots to connect:

- The iron mines in the Wisconsin Michigan Iron Range were owned by companies headed up by Joseph Walsh.
- The Wisconsin & Michigan RR. (WM) which hauled the ore from the mines was owned by Joseph Walsh.
- The Lake Michigan Car Ferry Transportation Co. (LMCETC) which ran these boats was owned by Joseph Walsh.
- The Illinois Steel Co., to whose Joliet Ill. Works the ore was headed, was owned by Joseph Walsh.
- Hmmmm… Could there be a relationship? In fact the general offices of the WM and the LMCFTC were both in the same building. That building was the office building adjacent to Chicago's Grand Central (railroad) Station.

The Joliet works of Illinois Steel was served by a lead line off of the Chicago Rock Island & Pacific Railroad, The Rock Island Lines (RI). To get a freight car from any of the three northern railroads to the RI efficiently it was necessary to route the car around the Chicago Terminal District via the "Outer Belt Route," formerly known as the Elgin Joliet & Eastern Railway (EJE).

This is of importance because the movement and switches at both ends would add at least 1 or 2 days to the trip as well as switching and demurrage charges. But of even more significance is the EJE which was owned equally by the Pennsylvania Railroad (PRR) and the UNITED STATES STEEL CORP. This company, founded by Andrew Carnegie and J.P. Morgan *et al*., was Illinois Steel Co.'s biggest competition.

It was possible for cars or even entire cuts of cars to be delayed, misrouted, vandalized, or even to disappear from EJE yards. Now who might want to "steal" a load or train of iron ore? It was also noticeable that the RL and the New York Central Railroad (NYC) had many east-west routes through freight tariffs and agreements. The NYC was the PRR's biggest competitor. Losses were best prevented by keeping ore trains away from the EJE.

Why the Barge & Tug?

Most car ferry operations on Lake Michigan used more conventional ships. These were enclosed, self-propelled ships with multiple decks. Often they carried passengers on the top decks. In these vessels, the rail cars were in a large continuous hold, out of the weather, near the water line. The Lake Michigan Car Ferry Transportation Co. ships were dramatically different.

Their boats were a set of un-powered, steerable barges with the rail cars on an open deck exposed to the weather. They had no provision for any passengers or other lading. These ferries did have a displacement hull with keel and steerable rudder. There are several theories as to why these ferries departed from the norm. Some may have been combined for the following reasons:

1. The prevailing winds. Most car ferries crossed the lake in the easterly – westerly direction, so they were traveling with or into the prevailing winds. The Peshtigo – Calumet Harbor run was north-south, crosswise to the prevailing winds. Being low to the water such ferries caught less of the crosswinds. This made the ferry easier to steer and ensure fuel economy.
2. The Calumet river transit. When transiting the Calumet River from Lake Michigan to the Rock Island Railroad slip, it was necessary to transit several miles of the river.
    a. Most large vessels might need a tug anyways to maneuver the tight turns.
    b. It enabled clearance under some bridges without their opening.
    c. Most fresh water steamers drew boiler water directly from the lake/river and had little storage on board since there was little need for water treatment. However, when (un)loading a standard ferry, it was often necessary to run the vessel's screws to keep the ferry lined up with the rail and snug to the dock. This would frequently cause the muck from the bottom to be churned

up and block the boat's boiler water intake. With the barge and tug system, once the barge was secured to the dock, the tug could sit in the flowing river which would carry the sediment away This saves almost an hour in the turnaround waiting for the water to clear.

3. Faster turnaround. The tug could move away to be refueled/re-provisioned while the rail cars were being switched (Chicago end) or barges could be changed off with minimum turnaround time (Peshtigo Harbor end).
4. Flexibility of operations. Should a tug need to be taken out of service for maintenance, i.e. boiler repairs, Inspections, etc. the other tug from the fleet or a "loaner tug" could be used to protect the operations.
5. Capital Costs. Tug boats and barges were more or less standard items. The costs of design and manufacture were significantly lower than the custom design and building of a steam ship. The tug boats and barges could be resold easily for a variety of functions when the ore mining operation played out.
6. No passenger demand. Few if any people needed to travel between the Peshtigo region and Chicago. It was, however, the practice of the railroads to allow 'deadhead' passage of employees of their and other railroad companies.

Why Roll-on Roll-off vs. Bulk Haulage?

To bulk haul would mean dumping ore from the rail car into the hold of the ore boat, generally via a massive and expensive ore dock and tipple structure, plus the need for several switch engines and crews to shove ore cars through the tipple. In the case of the Peshtigo - Joliet haul, the ore would had to have been reloaded on to railroad cars of the Chicago Rock Island & Pacific Railroad (RI) to finish the trip from Lake Calumet to the mill at Joliet, necessitating another costly and time-consuming operation at the south end of the lake. Unloading bulk ore from the ore boat would have been by steam powered crane with buckets, since self-unloading ore boats had not yet been invented. Roll-on/roll-off requires only the stern be bumped against an apron (ramp) with railroad tracks.

When the ore would be piled directly in the hold it would be necessary to clean the hold after each trip. This was a mean and arduous task, which often delayed the return departure of the boat. By keeping the ore in cars, all that was necessary was to sweep the floor out every few trips.

The use of railroad cars also allowed for the haulage of mixed freight and for back hauling other cargoes via the otherwise deadheading ferry. The ore cars were used to take coal north from the mines in south central Illinois and lime stone from quarries around Chicago. The flat cars could be back hauled with freight such as heavy machinery and bricks from the kilns on the north side of Chicago, etc. Therefore, haulage in bulk on great lakes ore carriers like the modern day Edmund Fitzgerald or Arthur C. Anderson was a disadvantage. The deep hulled competitors were railroad car ferry boats such as the Ann Arbor RR. or Pierre Marquette RR. fleets, or the "modern day" SS Badger, where the railcars were kept "inside" rather than on an open weather deck.

The Ship

Figure 1 - The Railroad Car Ferry Number 2 in Operation (used with permission[2])

Owner

The Car Ferry Barge No. 2 was owned by the Lake Michigan Car Ferry Transportation Company (LMCFTCo), which was a sister company of the Wisconsin and Michigan Railway. A Chicago railroad man, John N. Faithorn, and financial partners started the Wisconsin and Michigan Railroad as part of a rail-water transportation system([3] p186). This Transportation system would connect the rich iron ore and timber of Michigan's Northern Peninsula with Chicago's steel plants and lumber markets, on return trips the cargo would be coal from Southern Illinois[4, 5]. The owners of the Wisconsin and Michigan Railroad were using a capitalist business philosophy at that time. The idea was to get their products to Chicago as cheaply as possible. The Wisconsin and Michigan Railroad was incorporated on October 26, 1893. The railroad service started in January 1895, after purchasing existing railroads and acquiring trackage rights from other railroads. Two slips were built for the ferries in 1895; one slip was at Peshtigo Harbor in Wisconsin and the other slip was built on the Calumet River near 103rd St. The South Chicago site had access to different railroad lines and switching. It was in 1895 when Faithorn formed the Lake Michigan Car Ferry Transportation Company([3] p187).

Construction of the Ship

In March of 1895, the new company ordered a pair of identical wooden barges for the Peshtigo Harbor to South Chicago run. The barges No. 1 and the No. 2 were built by James Davidson in West Bay City, Michigan. Each barge was 310 feet long by 44 feet wide by 12 feet deep, with a gross tonnage of 1550, a net tonnage of 1460, a capacity of 28 rail cars on an open deck, and built at a cost of $48,000 each. The barges contained a steam plant and steering engine, but no propulsion machinery[4]. The company also purchased the tug J. C. Perrett, which was later renamed the J. C. Ames in honor of the secretary-treasurer of the railway([3] p187). The tug was used to pull one or two barges over 200 miles in choppy Lake Michigan water. Barge No. 1 inaugurated service on August 31, 1895, delivering 26 cars of coal and merchandise from South Chicago to Wisconsin & Michigan Peshtigo Harbor slip. One week later barge No. 2 entered into service. The No. 2 was first enrolled in Port Huron Michigan on 29 August 1895, and has an official U.S. registry number of 67314. In 1896, the company took delivery of barges No. 3 and No. 4 which were built by Craig Ship Building Co. of Toledo. The barges had a similar open deck design as barges No. 1 and No. 2[4]. Also, one more tug, the S. M. Fischer, was acquired which was named after the president of The Wisconsin and Michigan Railroad([3] p187).

History of the Ship's Operations

The water route of the Lake Michigan Car Ferry Transportation Company was from Peshtigo Harbor through the Sturgeon Bay Ship Canal and down the length of Lake Michigan to South Chicago. The trip could take between 23 and 30 hours depending on the weather conditions. One tug could handle 2 barges at 8 mph, although frequently only a single barge was hauled. This was probably the longest car ferry route on the Great Lakes, 240 miles and was at right angles to the prevailing winds([3] pp188,189). The rail cars on the barges were only protected from the weather by gunwales, and the free board was described by The Railroad Gazette as "high enough to protect the cars except in very high seas"([3] p187). This quote would prove to be prophetic. Not surprisingly the Lake Michigan Car Ferry Transportation Co. lost 3 of its 4 barges during its short operation.

The Lake Michigan Car Ferry Transportation Co. did not have the financial success it was hoping for. The northbound traffic was disappointing because shippers or other railroads were reluctant to subject equipment and cargo on an open barge. Also, the railroads looked on the Lake Michigan Car Ferry Transportation Co. as inferior to other Great Lakes car ferry operations and avoided using the South Chicago-Peshtigo route. They felt the investment of two tugs and four barges was not enough. As proof, the Central Freight Association refused to publish joint rates with the ferry line. The Lake Michigan Car Ferry Transportation Co. responded with rate-cutting measures. In August of 1896, the company became involved in a rate war with Chicago & Northwestern and the Milwaukee Road. This proved to be ineffective, and the ferry line continued to be dependent on traffic originating from their company railroad, the Wisconsin & Michigan([3] p189).

In October 1900, Chicago capitalist John R. Walsh purchased controlling interest of the Wisconsin & Michigan Railroad and became its director. Under his new management it was estimated the ore hauling business by railroad and car ferry system could be delivered for 30 cents a ton less than existing transportation to Chicago[4].

In 1900, barges No. 3 and No. 4 were temporarily leased to a Buffalo pulpwood dealer. Both barges sank in a heavy Lake Erie storm on November 13, 1900. This left only barges No. 1 and No. 2 in service. On September 29, 1906, barge No. 2 capsized inside the Chicago breakwater with the loss of three lives and cargo. This accident destroyed the hopes for the ore hauling business and the demand of the lumber business was diminishing. Due to financial problems, the Lake Michigan Car Ferry Transportation Co. operation between Peshtigo Harbor and South Chicago was closed in 1910([3] p183). In that same year John Walsh began a 5 year prison sentence for loaning himself millions of dollars from his Chicago National Bank to develop his railroads[4].

Previous Accident History

During its 11 years of service, the No. 2 had its share of mishaps. The tug and barge combination is more difficult to control during rough weather. The loading of car ferries can involve pushing a line of cars onto the docked vessel, which can be particularly hazardous. Occasionally while pushing cars, the switching crew would cause the ramp between land and the ferry to separate, causing whatever was on the ramp to plunge into the water. As a general practice self-propelled car ferries would work their engines slow in reverse during the loading operation. This would keep constant pressure against the ramp and dock. The No. 2 not being self-propelled could not do this. On June 16, 1901, while loading coal in South Chicago, the No. 2 broke free from the slip sending a loaded car to the bottom. The No. 2 had other accidents that were considerably worse. In June 1904, while being towed by tug S. M. Fischer, barge No. 2 arrived in South Chicago in sinking condition as a result of a collision in the fog. The barge was repaired in Manitowoc and returned to service. In June of 1906, while passing through the Sturgeon Bay ship canal, the tug J. C. Ames towing barges Nos. 1 & 2 collided with the railroad bridge at Sturgeon Bay. Later that same year the No. 2 suffered its final accident([3] p194).

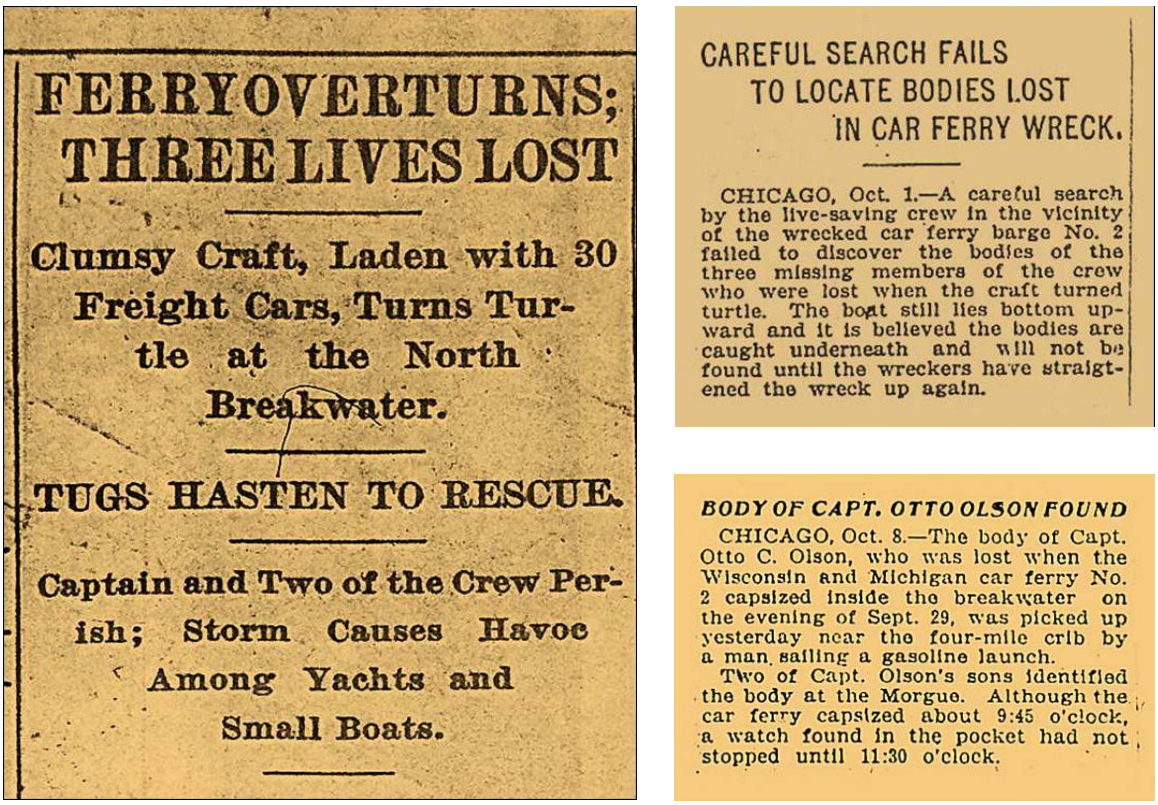
Capsize of No. 2 Barge

On Saturday, September 29, 1906, the Great Lakes were struck with a severe northeast gale in which several steamers and barges foundered([6], 30 Sept). The tug J. C. Ames was towing the Car Ferry No. 2 southbound to South Chicago with 28 railroad cars, 14 of them loaded with iron ore and 14 filled with cedar telegraph poles, from Peshtigo Wisconsin. The combined weight of the cars and cargo was in excess of 1000 tons([7] p45). According to historic records, it had been one of worst passages in memory.

Upon approaching Chicago, the waves were breaking heavily over the weather rail of the barge and water had found its way into the hold. The great amount of water in the hold caused the vessel to lurch dangerously, disturbing the equilibrium of deck load. At 7:00 pm, the tow was off Chicago harbor, but captain W. H. Welcher of the tug Ames thought it prudent not to push on to South Chicago in heavy seas and growing darkness, and so he brought the No. 2 just inside the Chicago harbor breakwater.

Captain Welcher noticed that his tow was listing too much to ride safely in the heavy swell beating back from the breakwater, and warned the crew of the barge not to anchor, but to remain on the tow line and pulled farther inside the harbor. However, the master of the barge, O. C. Olson, did not heed Captain Welcher's instructions, replying that the crew could pump out the barge where she was. The anchor was thereupon let go and the tow line cast off. The barge was listing slightly to the port, so Captain Welcher brought the tug about and remained close to No. 2.

Welcher called through a megaphone to O. C. Olson, Master of Car Ferry No. 2, inquiring if the barge needed help. Olson replied he did not, even though No. 2 had about 3 feet of water amid-ship. Given the severity of the storm, this did not seem unusual. Welcher heard the barge pumps working and assumed she would right herself shortly. The great weight of the iron ore, however, made the barge unstable. Suddenly Olsen whistled for assistance and the barge unexpectedly keeled over to port([3] pp194,195).



FERRY OVERTURNS; THREE LIVES LOST

Clumsy Craft, Laden with 30 Freight Cars, Turns Turtle at the North Breakwater.

TUGS HASTEN TO RESCUE.

Captain and Two of the Crew Perish; Storm Causes Havoc Among Yachts and Small Boats.

CAREFUL SEARCH FAILS TO LOCATE BODIES LOST IN CAR FERRY WRECK.

CHICAGO, Oct. 1.—A careful search by the live-saving crew in the vicinity of the wrecked car ferry barge No. 2 failed to discover the bodies of the three missing members of the crew who were lost when the craft turned turtle. The boat still lies bottom upward and it is believed the bodies are caught underneath and will not be found until the wreckers have straightened the wreck up again.

BODY OF CAPT. OTTO OLSON FOUND

CHICAGO, Oct. 8.—The body of Capt. Otto C. Olson, who was lost when the Wisconsin and Michigan car ferry No. 2 capsized inside the breakwater on the evening of Sept. 29, was picked up yesterday near the four-mile crib by a man sailing a gasoline launch.

Two of Capt. Olson's sons identified the body at the Morgue. Although the car ferry capsized about 9:45 o'clock, a watch found in the pocket had not stopped until 11:30 o'clock.

Figure 2 - News Articles Describing the Sinking[8, 9]

The tug J. C. Ames immediately put out a life boat and the nearby tugs Perfection and O. B. Green came to aid in the rescue. The Life Saving Station at Chicago Harbor was also called into service. The vessel capsized so quickly that the crew had little time to look out for themselves. Three crew members were pulled from the water: John Dempsy (mate) and William Bunnell (wheelman) were taken from the water by the tug Perfection, and Norman Kennedy (cook) was picked up by the life-saving crew. He was clinging to some floating telegraph poles. Captain Olson, William L. Johnson (wheelman) and Gabriel Henson ("donkey man") could not be found and were presumed drowned.

The freight cars sunk to the bottom of the harbor([3] p195). Later, 48 railroad trucks were salvaged. The iron ore that sank into the deep mud was not recovered[10]. The estimated total loss was $69,000([7] p45). The No. 2 barge remained afloat, keel upward with an air pocket trapped in her hull and there she remained until the spring[10].

Salvage Attempts and Scuttling, Spring 1907

In the spring of 1907, the overturned hull of No. 2 Barge was towed out to a spot approximately 3.5 miles E/NE of the Calumet Harbor light. Attempts to turn over and right the hull were unsuccessful, resulting in the bow sinking. At this point, the stern was still floating, but the bow was stuck in the lake bottom, in approximately 42 feet of water, as shown in a sketch literally on the back of an envelope from 1907, as shown in Figure 3[10].

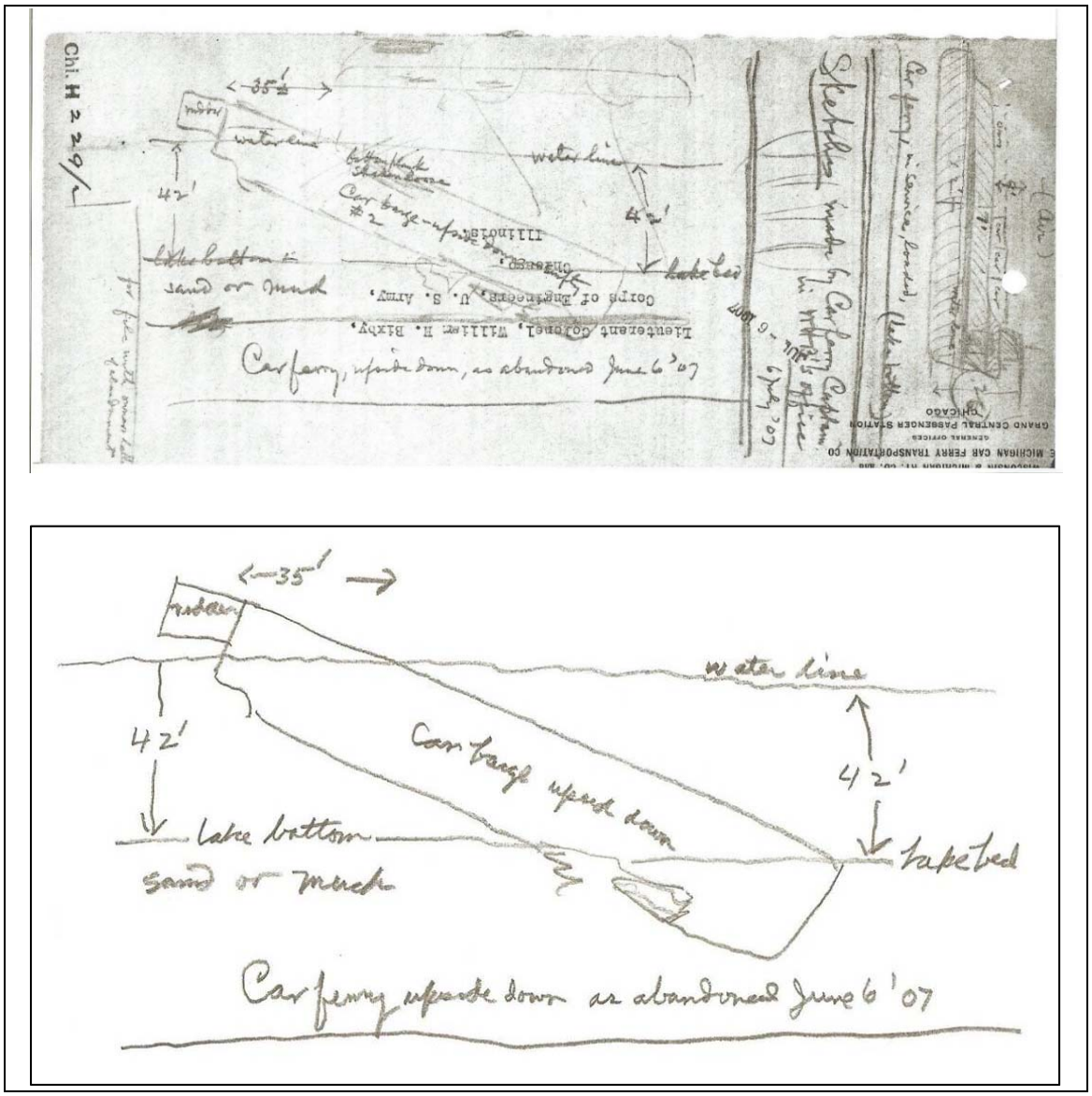


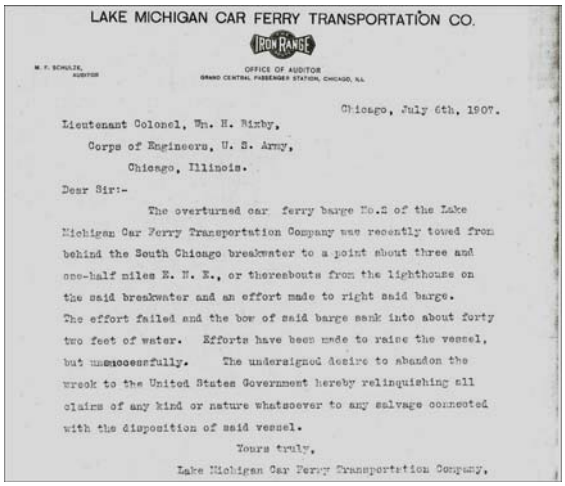
Figure 3 - Hand Drawn Sketch of the Wreck from 1907 (above), and Cleaned Up (below).

After attempts to right the hull failed, the Lake Michigan Car Ferry Transportation Co. abandoned ownership of the wreck to the United States Government, as documented in a letter dated July 6, 1907. In this position the wreck was classified as a hazard to navigation, being on or near a direct course between Chicago and Indiana Harbor and having less than 24 ft of water over the wreckage[10].

In August 1907, Great Lakes Dredge and Dock won and executed the contract to scuttle her where she lay, and remove the hull as a hazard to navigation. However, in the following year, a September 1908 report stated there was still less than 24-ft clearance over some parts of the wreck, and so she was dynamited as she lay on the bottom[10].

In October 1908, a bill was submitted by Great Lakes Dredge & Dock Company to the U.S. Army Corps of Engineers. Notice the cost of dynamite was the largest item on the expense report. Upon visiting the wreck, it is easy to see why nothing is more than a few feet above the lake bottom. Since the hull was upside down when it was sunk, it sits bottom side up on the lake floor, giving a unique view of some construction details.

See Appendix B for the full correspondence between the Lake Michigan Car Ferry Transportation Company, the U.S. Army Corps of Engineers and the Great lakes Dredge and Dock Company regarding the abandonment and subsequent salvage and demolition operations of the Car Ferry No. 2[10].



LAKE MICHIGAN CAR FERRY TRANSPORTATION CO.

IRON RANGE

M. F. SCHULZE, AUDITOR — OFFICE OF AUDITOR, GRAND CENTRAL PASSENGER STATION, CHICAGO, ILL.

Chicago, July 6th, 1907.

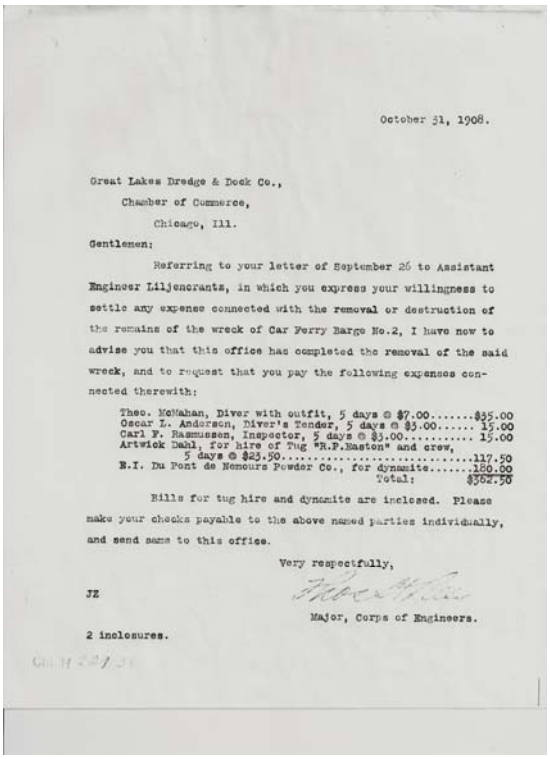
Lieutenant Colonel, Wm. H. Bixby,
Corps of Engineers, U. S. Army,
Chicago, Illinois.

Dear Sir:-

The overturned car ferry barge No.2 of the Lake Michigan Car Ferry Transportation Company was recently towed from behind the South Chicago breakwater to a point about three and one-half miles E. N. E., or thereabouts from the lighthouse on the said breakwater and an effort made to right said barge. The effort failed and the bow of said barge sank into about forty two feet of water. Efforts have been made to raise the vessel, but unsuccessfully. The undersigned desire to abandon the wreck to the United States Government hereby relinquishing all claims of any kind or nature whatsoever to any salvage connected with the disposition of said vessel.

Yours truly,
Lake Michigan Car Ferry Transportation Company,

Figure 4 - Letter of Abandonment from the LMCFTC



October 31, 1908.

Great Lakes Dredge & Dock Co.,
Chamber of Commerce,
Chicago, Ill.

Gentlemen:

Referring to your letter of September 26 to Assistant Engineer Liljencrantz, in which you express your willingness to settle any expense connected with the removal or destruction of the remains of the wreck of Car Ferry Barge No.2, I have now to advise you that this office has completed the removal of the said wreck, and to request that you pay the following expenses connected therewith:

Theo. McMahan, Diver with outfit, 5 days @ $7.00	$35.00
Oscar L. Anderson, Diver's Tender, 5 days @ $3.00	15.00
Carl F. Rasmussen, Inspector, 5 days @ $3.00	15.00
Artwick Dahl, for hire of Tug "R.P.Haston" and crew, 5 days @ $23.50	117.50
E.I. Du Pont de Nemours Powder Co., for dynamite	180.00
Total:	$362.50

Bills for tug hire and dynamite are inclosed. Please make your checks payable to the above named parties individually, and send same to this office.

Very respectfully,

JZ

Major, Corps of Engineers.

2 inclosures.

Figure 5 - Bill for Demolition to Remove the Car Ferry as a Hazard to Navigation

One of the interesting side effects of the dynamiting was the large number of dead fish that washed ashore. There were so many free fish to be had for the scooping that the market price for fresh fish fell temporarily to zero, as shown in Figure 6 ([11], 8 Aug).

EVERY DAY FRIDAY IN SOUTH CHICAGO; DYNAMITING FILLS TOWN WITH FISH

People Find Supply of 700 to 1,000 Herring and Whitefish Ready to Be Picked Up at Each Explosion Beneath Wreck.

Every day is Friday in South Chicago now. The town has placed itself upon a fish diet for the time being. Fish are so plentiful as to be had for the asking. The succulent herring, the flaky whitefish, the toothsome lake perch, and all others of the finny tribe are so plentiful in the neighborhood of the "hundredth" streets as to have no present market value.

The reason for the enormous supply of Friday diet is that the wrecked car ferry No. 2 of the Lake Michigan Transportation company, lying about three miles off shore, is being dynamited by the authorities. The wreck has been a menace to navigation for some time and dynamiting was the only feasible method of removing it. With every discharge of dynamite being used on the wreck from 700 to 1,000 fish are killed. Every man in South Chicago who can beg, borrow, buy, or "temporarily acquire" a boat is on the scene scooping up the fish in nets.

Even the unfortunates on shore who cannot procure a means of navigation are sharing in the harvest, as fish are being washed ashore in quantities.

Figure 6 - Article Documenting Dynamiting of Fish

The Site

Today the Car Ferry lies in approximately 42 ft of depth in Indiana waters, at approximate GPS location 41° 45' north by 87° 25' west, as shown in Figure 7 below, as determined by Humminbird GPS and sidescan sonar. The main wreck site is approximately 360 feet long by 80 feet wide, with the bow pointing nearly due north. The lake bottom is predominately flat and muddy in this location, with some scattered rocks and a rather large pile of square-cut stone around the bow of the wreck site, with some debris scattered away from the primary site. The wreck is covered in zebra mussels, as so many Lake Michigan shipwreck sites are these days, and some fish have also been spotted on the wreck site. There is no significant vegetation growing in the area.

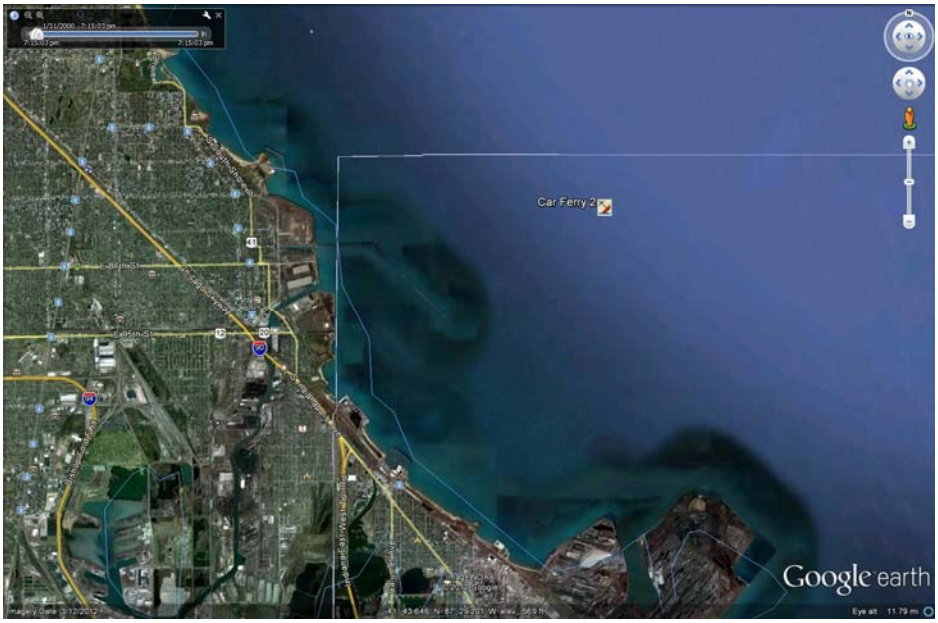


Figure 7 - Railroad Car Ferry No. 2 Located E/NE of Calumet Harbor at Approximately 41º 45' N by 87º 25' W in Indiana Waters

Prior Work

The Railroad Car Ferry No. 2 is now a popular dive site, which has been visited extensively for many years by recreational divers and avocational underwater archaeologists, both local to the area and visitors from farther away. A number of presentations have been made on the Car Ferry at local archaeological and dive club meetings, SCUBA trade shows, and similar venues. In addition, at least two previous archaeological surveys have been made of this site - One by the Indiana State Archaeologist, Gary Ellis in 1986 and 1987[12], and more recently a survey for the Indiana Department of Natural Resources, Lake Michigan Coastal Management Program in 2011[13].

The Car Ferry No. 2 was investigated as part of the Marine Cultural Resources Survey (MCRS) program in the summer of 1985 and in 1986 and 1987 by Gary Ellis, State Archaeologist at the time[12, 13]. The shipwreck was systematically surveyed using surface sonar, sub-bottom profiling and direct survey using SCUBA divers[12]. In the 1980s, additional documentation consisted of notes, site maps, measurements, and drawings. In July of 2011, the site was surveyed by remote sensing and direct divers in the water. A total of 52 remote sensing survey lanes/transects were recorded using two different kinds of sidescan sonar. From the 2011 survey, documentation consisted of sidescan sonar data, notes, site map, photography, and high definition videography[13].

Archaeological Methodology

This survey has been conducted using standard underwater archaeological techniques, as covered in NAS I training courses [14] and similar courses and references. Specifically the following activities were conducted:

Sidescan Sonar

A Humminbird 898 sidescan sonar was deployed from a small private boat, the ***Diving Belle***. Data was collected using a frequency of 800 MHz and a scanning range of 150 feet either side of the boat, using a stern-mounted transducer, operating the boat at approximately 5 mph. Temporary marker buoys were placed in the water as reference points to guide the scanning operations, and recovered as soon as the scanning was complete. Collected data was processed using the following five software programs:

1. Humminbird PC [15, 16] - For the management of GPS waypoints and survey tracks.

2. Humviewer [17] - For a preliminary review of collected sonar data, and identification of areas of interest.

3. SonarTRX [18] - This commercial software product processes the sidescan data to produce images, taking into account the motion of the boat including direction changes, and produces geo-spatially located imagery that can be viewed "on location" in Google Earth or pulled into Photoshop for further image enhancement.

4. Google Earth [19] - This program displays SonarTRX imagery as well as waypoints and scanning routes in their proper geographical location, and can also be used to determine the GPS location of key locations on the sonar scans, such as planning locations for temporary marker placement or for identification of the location of debris spotted away from the main wreck site.

5. Adobe Photoshop [20] - For image enhancement such as contrast and brightness adjustment, text annotation, cropping, and report generation purposes only.

Underwater Measurements

Direct diver survey employed divers using 100-ft and 300-ft tape measures to record overall distances and the locations of key artifacts and features using one of the two measurement methods described in the following sub-sections. Measurements of smaller distances, such as the dimensions of artifacts found, were conducted using smaller tape measures, calipers, or other measurement tools as appropriate.

Centerline-Offset

A 300-ft tape was stretched down the centerline of the wreck site, (with a second tape extending the centerline an additional 60 feet), and measurements made at a perpendicular offset away from this centerline using a 100-ft or shorter tape measure and a compass.

Trilateration

Distances were measured from each location of interest to two known reference points, forming a triangle of known dimensions. Standard trigonometric calculations were then used to determine the exact location of the point of interest, relative to the two known reference points. Those known points may be two points along the length of the centerline tape, or two reference points, or datums, established specifically for this purpose (see below) or any other two points whose location is already known from previous survey work.

Reference Tag Grid System

A series of numbered plastic tags (Figure 8 below) were placed along the wreck site, at approximately 20-ft intervals, along the centerline, the port, and the starboard sides[1]. Additional tags were used to mark specific artifacts and other features of interest. These tags were attached using plastic zip ties only, in a manner designed not to cause any damage or permanent change to the wreck site. These tags are temporary markers that were left at the site for monitoring purposes to assess changes at the site as time progresses. They can be removed at any time.

Figure 8 - Typical Reference Tags (Above in Green) and Feature Tags (Below in Gold) Used for This Project.

[1] **Note:** For the purposes of this work, "port" refers to the left side of the wreck site as observed by a diver swimming from the stern towards the bow, and "starboard" refers to that diver's right. Because the ship is upside-down, this convention is exactly opposite from the port and starboard sides of the ship when upright.

The distances between these tags were carefully measured and entered into a special software program named “Site Recorder 4 SE”, available from 3H Consulting Ltd[21]. This software performed a minimization-of-error procedure to determine the exact location of each of the reference tags, relative to all of the other tags, and produced a map of these marker tags, or a reference grid, such as the sample shown below in Figure 9. (In this image red, blue, and green lines represent low, medium, and high levels of confidence respectively, based on consistency of multiple measurements.)

This reference grid provided a system of known locations that could be used for the trilateration measurement of features and artifact locations, as well as divided the wreck site into manageable sections that could be surveyed by a single individual on one or two dives. An added benefit on this very large site was that the markers also served as a navigation aid for divers, similar to highway mile markers. This navigation aid proved to be especially useful for new surveyors and other visitors not familiar with the site.

After the main site survey was completed, the reference tag system was left in place, for use in follow-up detail or monitoring studies of small sections of the wreck. In the future, this reference grid could be used as a navigational aid for visiting recreational divers and for training future avocational underwater archaeologists.

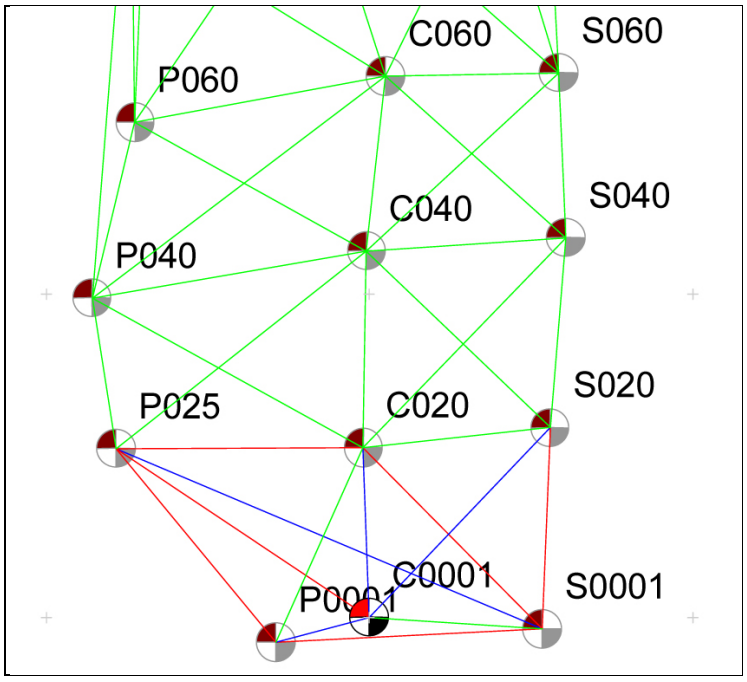


Figure 9 - Typical Results Elicited from the Reference Tag Grid System. (Stern Section).

Underwater Photography and Videography

Underwater digital photographic and video cameras were used to document the wreck site and specific features of interest. Where applicable, photo scales were included to document the size of the objects photographed, as shown in Figure 10 below. Individual images and frames from video were combined into a large overall site image or photomosaic.

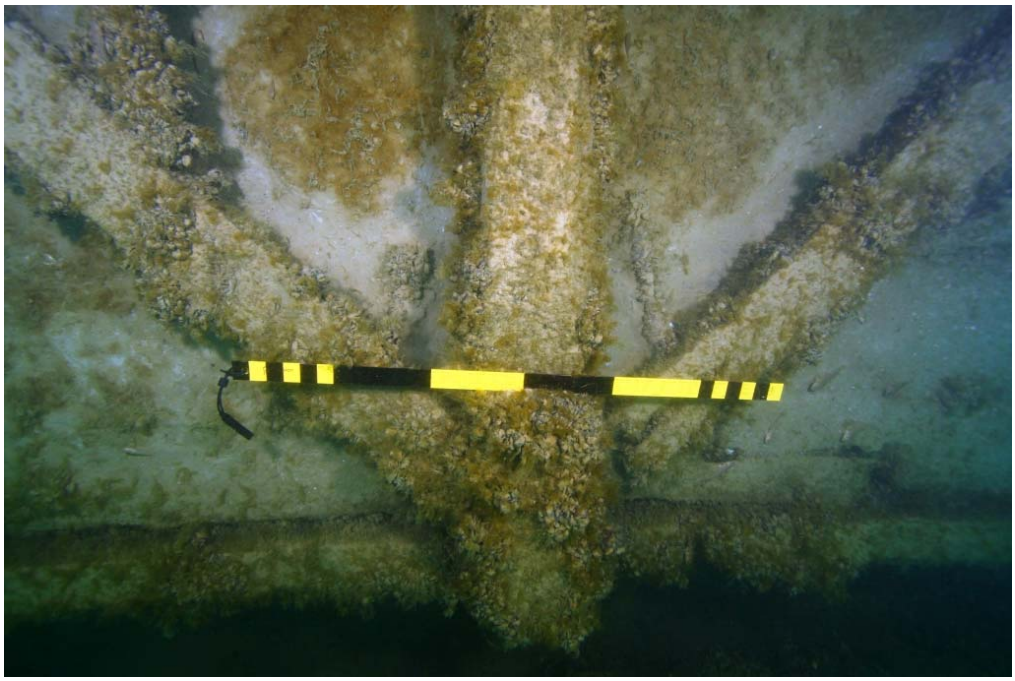


Figure 10 - Typical Use of a 3-ft Photo Scale to Document Relative Dimensions.

Logistical Issues

Safety Procedures

All personnel who conducted underwater operations were certified SCUBA divers, and had a minimum of Advanced Open Water and Wreck Diving training. All diving was conducted following standard safe diving practices. Every boat operation included an above-water observer as surface support, who was prepared to provide aid or call for assistance as necessary. Boats carried standard first-aid equipment including oxygen and personnel trained in the administration of oxygen for diving-related injuries.

Schedule

The field work commenced in July 2006 and was completed by the end of August 2014. Because the work was done almost entirely by avocational volunteers with conflicting obligations, and was also subject to the whims of the weather, the exact number and scheduling of dive outings and other activities varied greatly from year to year. (See Table 1, p. 29.)

Budget

There was no formal budget for this project. There were no labor or charter costs, as all work was done by volunteers operating off of small private boats. Gasoline and similar costs were paid out of pocket by project participants, and equipment used was the personal property of those involved. The equipment employed for fieldwork included open circuit SCUBA that was well-maintained, inspected, and tested prior to each dive.

Results

Summary of Diving Operations

From July 2006 until August 2014 a total of 212 dives were completed by 26 different divers, during 45 separate excursions by multiple different dive boats, as summarized in the tables below and documented fully in Appendix A.

Year	Excursions	Total Dives
2006	9	46
2007	3	13
2008	2	5
2009	2	3
2010	5	21
2011	6	46
2012	10	44
2013	4	19
2014	4	15
Total	45	212

Table 1 - Dive Summary by Year

Diver	Total Dives	Diver	Total Dives
J. Bell	48	R. Barski	3
J. Loftus	43	B. Rushman	2
J. Gerty	31	D. Doherty	2
T. Kiefer	16	J. Donoval	2
J. Jarecki	15	J. Martin	2
R. Hughes	8	M. Gagliardi	2
D. Nolan	7	T. Chemler	2
S. Reimer	6	B. Messner	1
J. Rouse	4	C. Gadbois	1
M. Engelsman	4	C. Kohl	1
J. Boldenow	3	E. Vaandering	1
J. Mendelsohn	3	M. Malone	1
J. Scheibe	3	R. Gadbois	1

Table 2 - Dive Summary by Diver

Overall Site Plan I – Via Composited Photographs

One of the first tasks accomplished on this project was taking a series of photographs by a free-swimming diver, "mowing the lawn" from side to side and from one end to the other, ultimately capturing hundreds of images similar to those shown in Figure 11. Several different attempts were made to mosaic these photographs into a single composite image, yielding results such as those shown in Figure 12. Unfortunately the large number of photos involved, ultimately made this approach unsuccessful, and so other techniques were needed.

Figure 11 - Selected Photographs Used for the Photo Mosaic

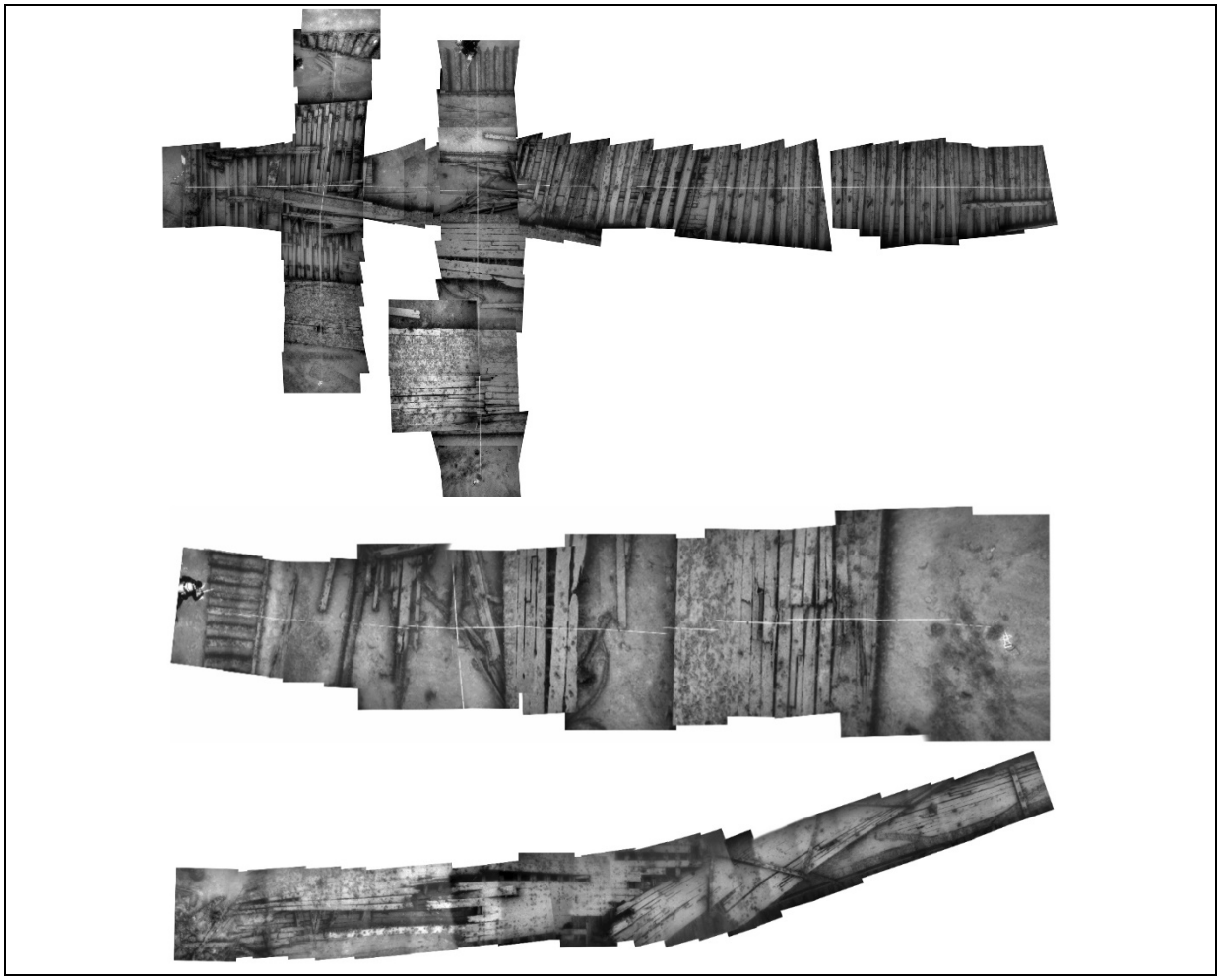


Figure 12 - Composite Images Created from Mosaic Photographs.

Overall Site Plan II – Via Sidescan Sonar Imagery

On July 6, 2012, eighteen passes were made over the wreck site using sidescan sonar, which eventually led to 18 images, each showing some portion of the wreck site in good detail, such as the sample image shown in Figure 13. These images were then merged together to get a composite image of the overall wreck site, as shown in Figure 14. Based on this composite image and along with additional photographs, videos, sketches, and direct observation, the overall site plan was created (shown in Figure 15).

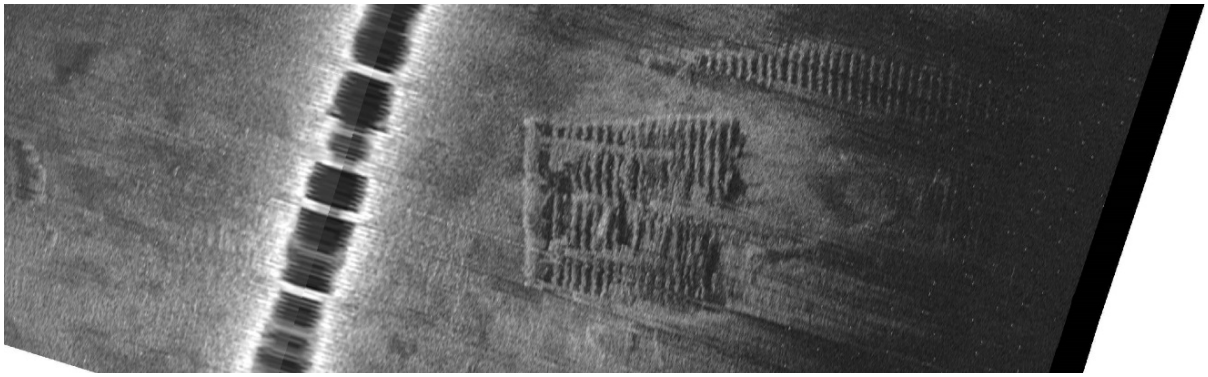


Figure 13 - Sample Sidescan Sonar Image

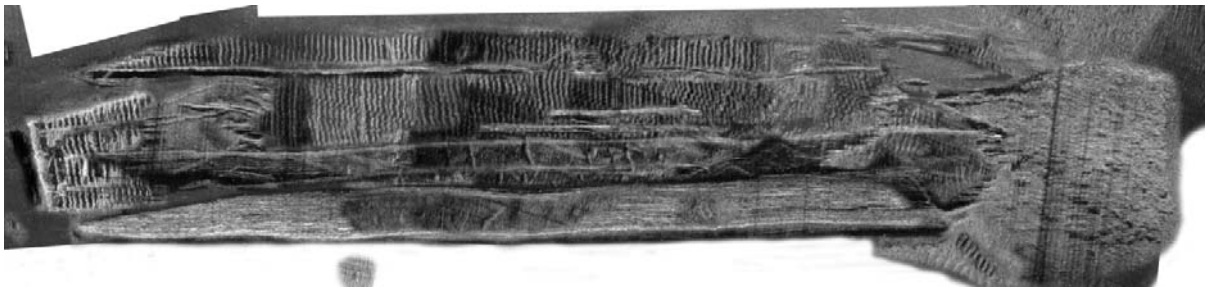


Figure 14 - Composite Image from Merged Sidescan Sonar Images

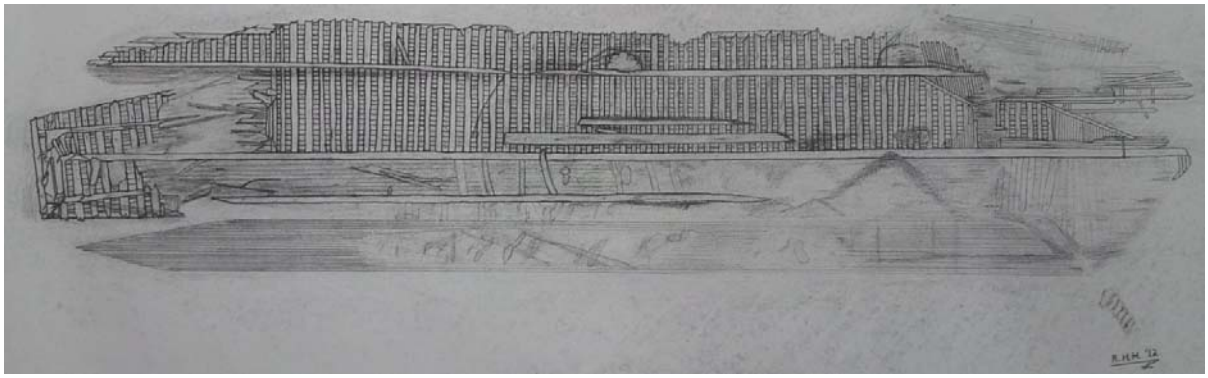


Figure 15 - Car Ferry No. 2 Site Plan Drawing by Robert Hughes

Ship's Construction Details

There are no surviving plans for Davidson's No. 2 Barge or its identical twin, No. 1 Barge. However, much of its construction can be inferred from historical pictures and observations of the wreck site in its present state.

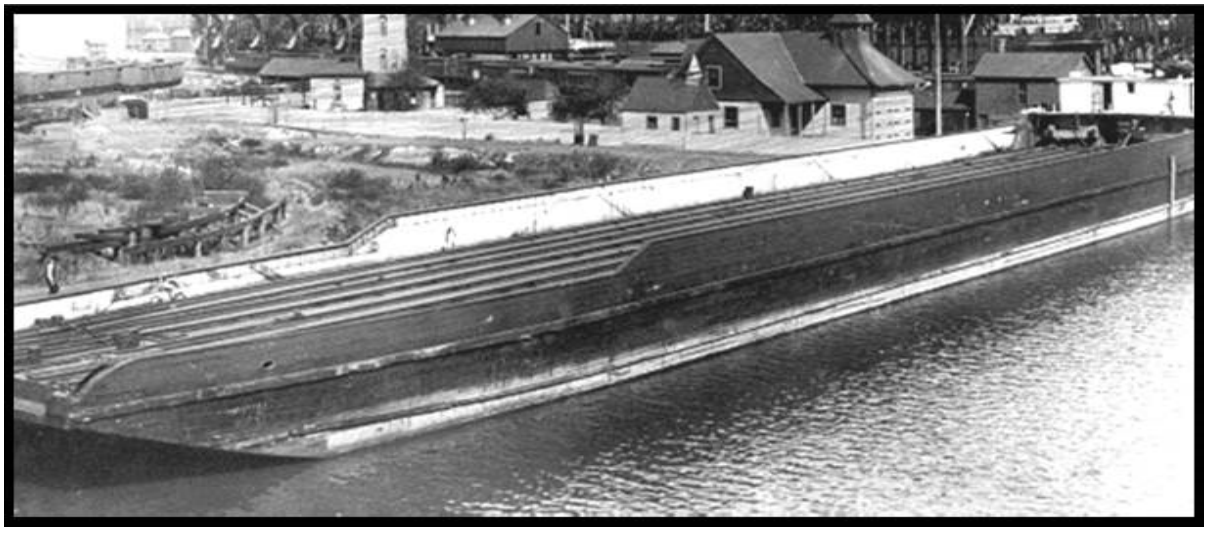


Figure 16 - Car Ferry No. 1, Identical to the No. 2 (used with permission[2])

The main wreck site is quite large, measuring 330 ft long and as wide as 100 ft in parts. The centerline lies at 350 degrees with the bow at the north end. The bow area is broken and scattered, as shown in Figure 17 and Figure 18:

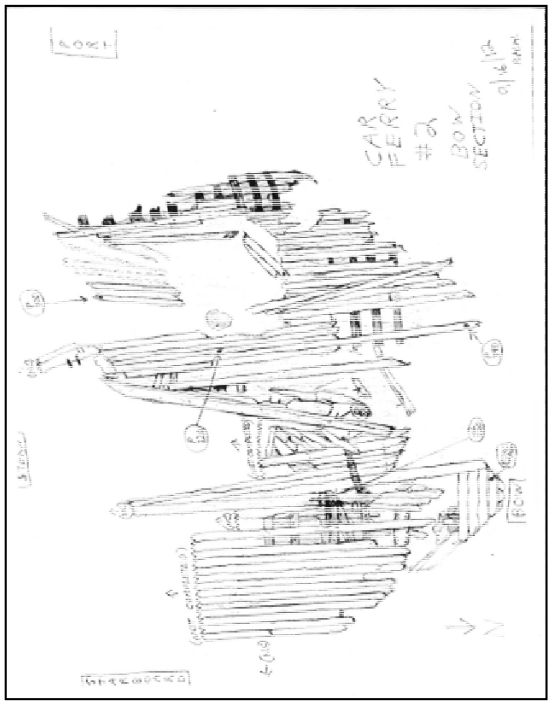


Figure 17 - Bow Sketch by Robert Hughes.

Figure 18 - Photo Typical of the Bow.

Beyond the bow, a rocky debris field extends another 85 ft. It cannot be determined if this debris field consists of possible ballast stone or simply is part of the Lake Michigan bottom. A donkey engine and boiler were located at the front of the vessel in operation, but were not found at the wreck site. There are no other large iron pieces present elsewhere on the site. Perhaps the engine and boiler fell off the turtled hull when the wreck was floating in Chicago Harbor. No documentation was found concerning salvage of this machinery.

The stern is made up of three wooden beams measuring 1 x 1 ft. It rises from the Lake bottom almost 3 ft high. In the center of the top beam there is a 2 ½-ft notch that is 6 inches (in) deep. This comprises the vessel's transom with the car deck attached. The length of this assembly was measured to be 37 ft, 8 in.

Moving forward (north) there are 2 large beams measuring 10 x 10 in forming a "V" rising approximately 30 degrees from the deck beams. The right hand beam is 6 ft long and is 16 ft from the transom. The beam comprising the left side of the "V" is 5 ft long and is 18 ft, 9 in from the transom. Keeping in mind, we were looking at the wreck from below the car deck, these two beams formed an inverted "V" supporting the car deck at the center. On the starboard side of the transom, the hull pieces are detached from the main deck. Running forward, the hull pieces join the main deck wreckage 52 ft from the stern. Large pieces of hull lie on top of each other as a result of leveling the wreckage using dynamite. Some pieces of hull are facing upward while some hull pieces have their inside facing upward.

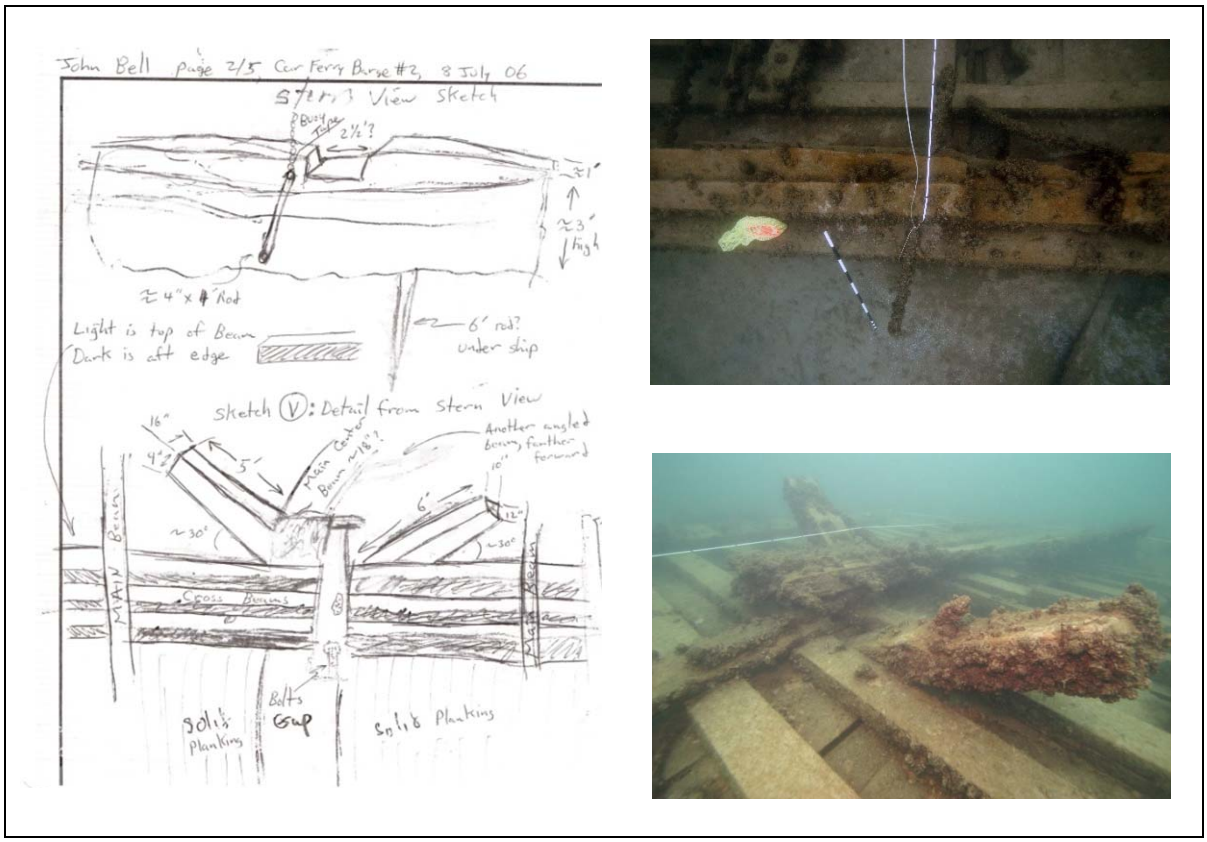


Figure 19 - Sketch and Photos of Stern and "V-Brace"

James Davidson made some of the largest wooden boats on the Lakes. He used steel plates to extend the practical length of wooden hulls. In effect, Davidson built a steel truss attached to the inside hull planking on either side. This steel bridgework minimized hull flexing common in wooden boats. This made building wooden hulls to 300+ ft possible. The truss was made with ½ in steel plate bolted to the inside of the hull planking with square headed bolts and nuts. The longitudinal plates were 18 in wide, while the plates running diagonally were 12 in wide. See the diagonal braces on No. 1 in Figure 16 and on No. 2 in Figure 20.

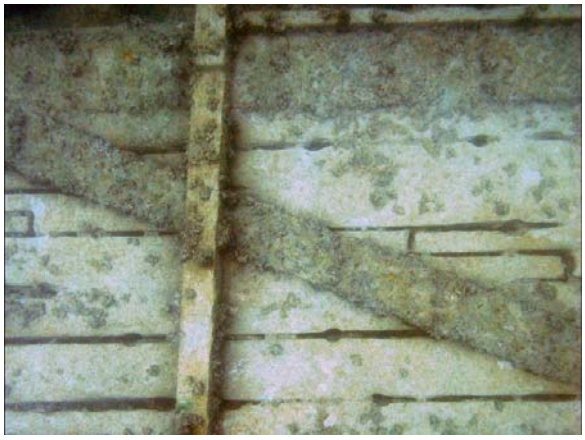


Figure 20 - Diagonal Steel Bracing

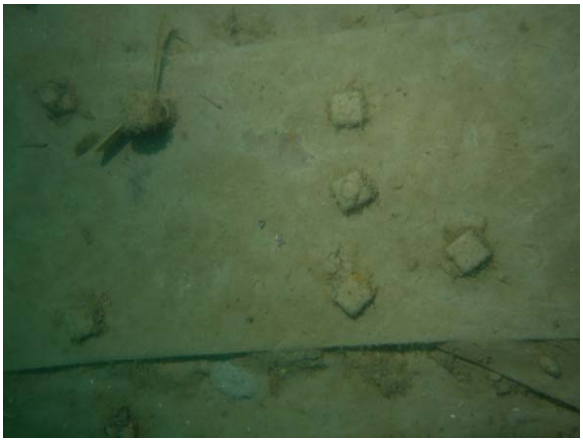


Figure 21 - Steel Plate With Square Nuts

On the inside of the hull there was also a series of notched vertical beams measuring 7 x 8 in that were 10 ft, 6 in long. These vertical wooden supports started 8 ft from the stern and continued forward on 20 ft centers. They were attached to the hull with 2 steel clinch rods. The outer hull planking measures 12 in wide and is 4 in thick.

The deck beams are on 24 in centers and measure 10 to 12 in wide and are 12 in thick. A unique construction feature is the use of 1¾-in steel rod every 5 deck beams to hold the hull sides together in tension. A turnbuckle is employed in the center holding the two pieces of rod together. Perhaps these turnbuckles were occasionally tightened as the stress of the loaded railcars caused the deck to work loose from the hull.

Figure 22 - Steel Rod With Plates and Nut

Figure 23 - Turnbuckle

In summary, James Davidson used steel plates to stiffen the hull longitudinally and steel rod to compress the hull to the deck.

According to Hilton[3], two weights of rail were used on the No. 2 Barge. The railcars traveled on a 75-pound (lb) rail, while a lighter 60-lb rail was used outside of the car track. This lighter rail was called the jacking rail. A screw jack was positioned against this rail and used to slightly lift the car. A chain was then used to fasten the car to the jacking rail. The combination of upward force from the screw jack and downward force from the clamped chain provided stability and secured the railcar to the deck. Wheel chocks were also clamped to the 75-lb rail to prevent movement during rough seas, and hand brakes set on each car, as per standard industry practice.

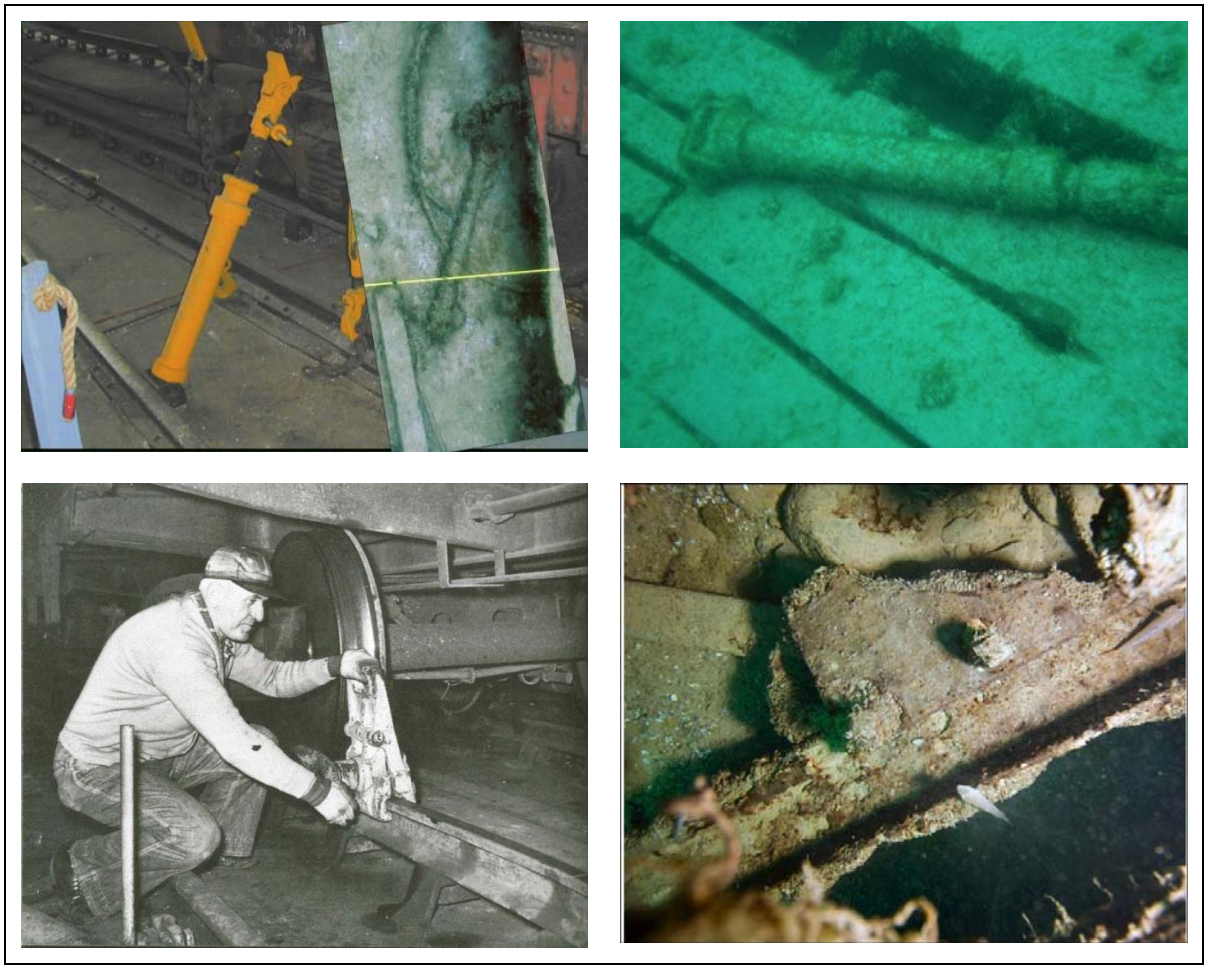


Figure 24 - Screw Jacks and Rail Clamps, In Use and In Situ

There are pieces of rail present in two areas of the wreck. The bow has several pieces of rail present among the scattered wood. The other area with rail is 32 ft forward of the stern and to the left of the centerline. A large number of deck beams are missing and much of the rail is twisted and bent, probably from the scuttling and explosion. Measurements and impressions were taken here and at the bow in attempt to find dimensional differences between the different weight rails; however no rail size variances could be detected among the rails measured. No brand, (rail size, mill plant, and date of rolling), was found on any rail found at the wreck site.

Figure 25 - Typical Rail

Figure 26 - Measuring Rail Dimensions

Reference Tag Grid

The completed reference grid diagram is shown below in Figure 27, and overlaid on the site plan drawing in Figure 28, with the bow towards the right in both Figures. The green lines indicate measurements with the greatest estimated accuracy, and the red lines the least.

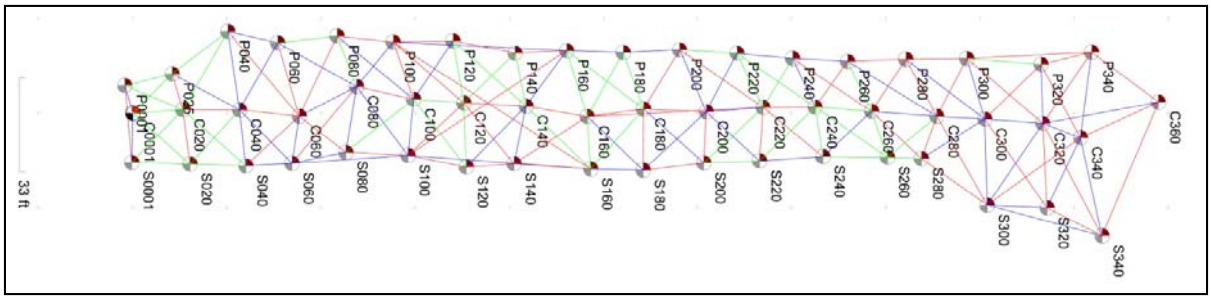


Figure 27 - Overall Site Plan Reference Grid

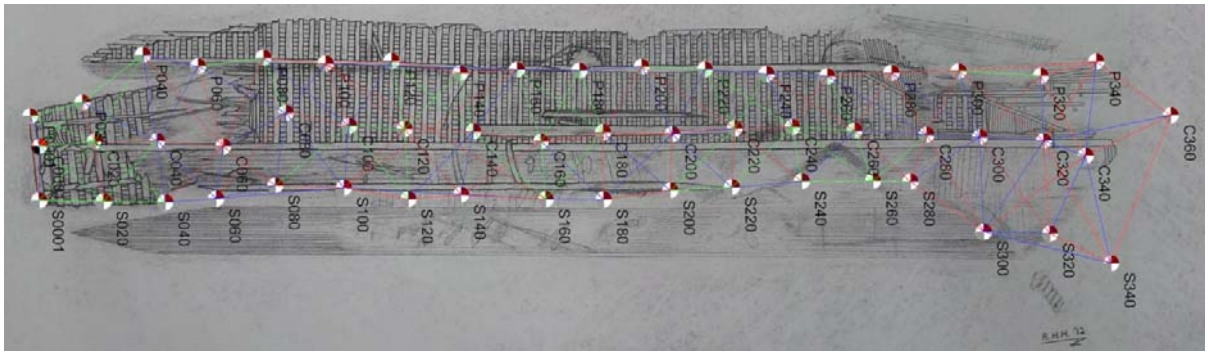


Figure 28 - Overall Site Plan Overlaid with Final Tag Map

Sectional Studies Based on the Reference Tag Grid

The reference tag grid system was used quite successfully as a supporting framework for a series of detailed sectional studies, and more importantly, as a basis for combining adjoining sections into a larger cohesive unit. Three separate divers on three different days were given Mylar sheets with reference tag locations pre-printed on them, as seen in Figure 29 below. The divers used these sheets to record measurements and observations of their assigned sections, as shown in Figure 30 to Figure 32 in Table 3. Two of the divers, Robert Hughes and Tony Keifer, used their notes (along with some photos and video recordings) to produce the finished drawings shown in Figure 33 and Figure 34 respectively.

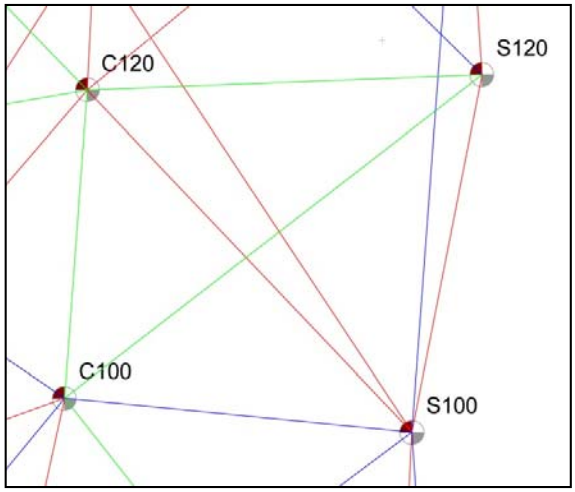


Figure 29-Typical Initial Grid, C100-S120

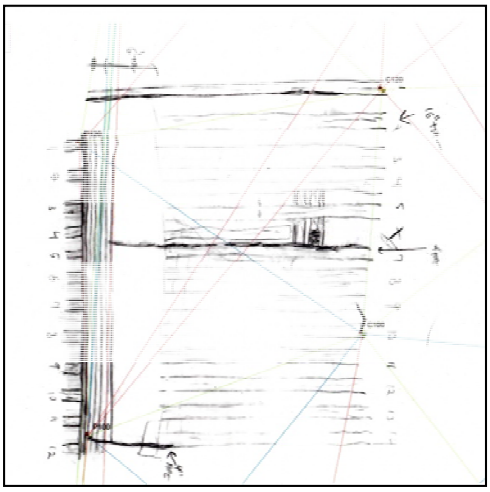


Figure 30 - Diver's Notes on P100-C120

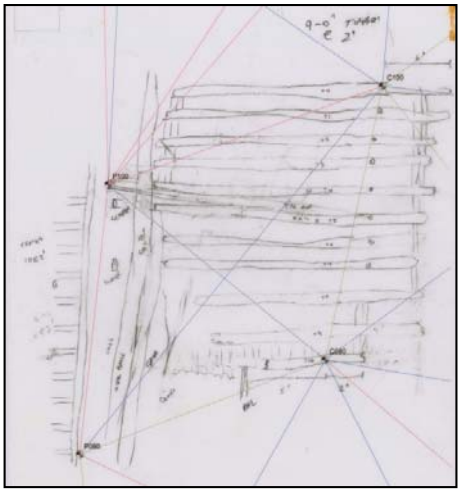


Figure 31 - Diver's Notes on P80-C100

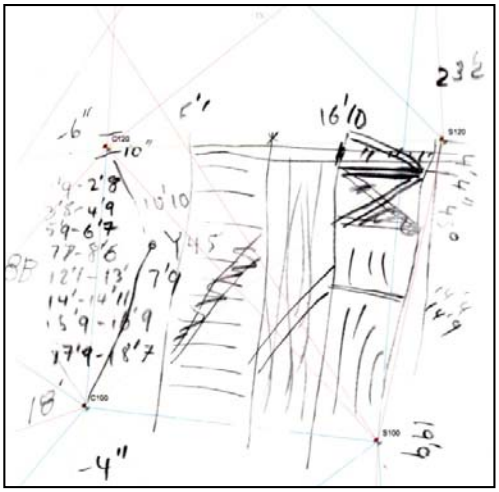


Figure 32 - Initial Notes on C100-S120

Table 3 - Typical Grid and Diver Notes for Sectional Studies

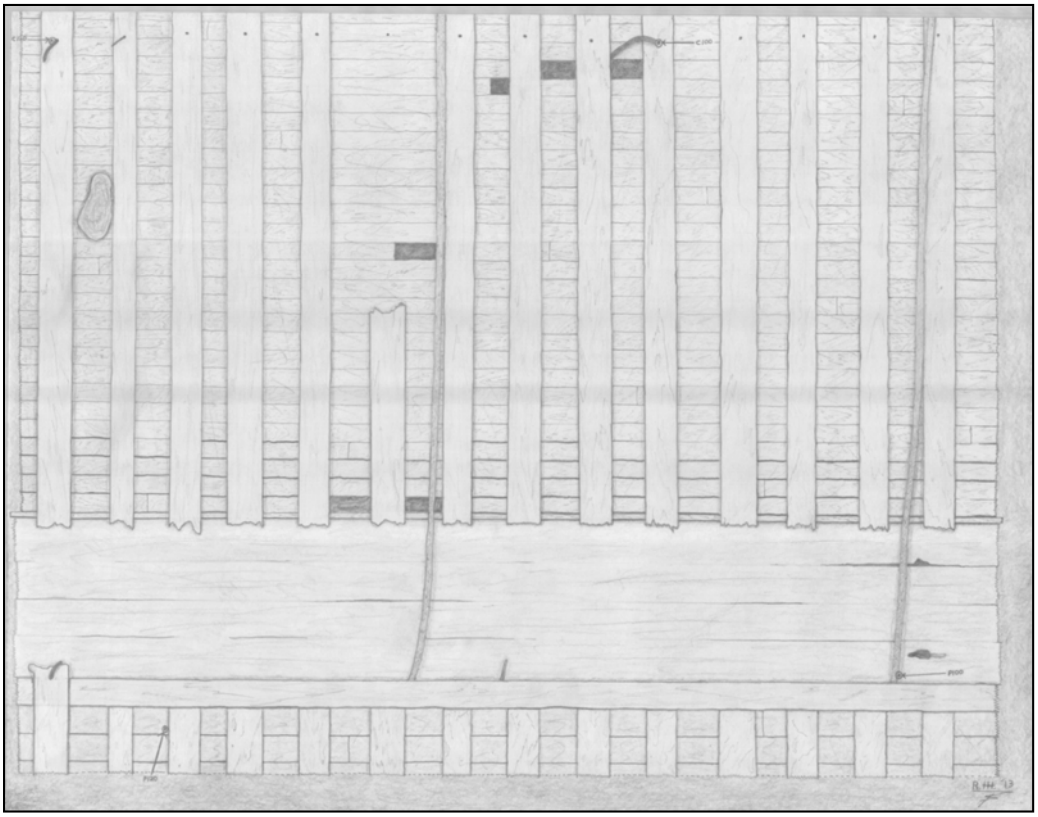


Figure 33 - Sectional Study of P100-C120 Based on Reference Tag Framework

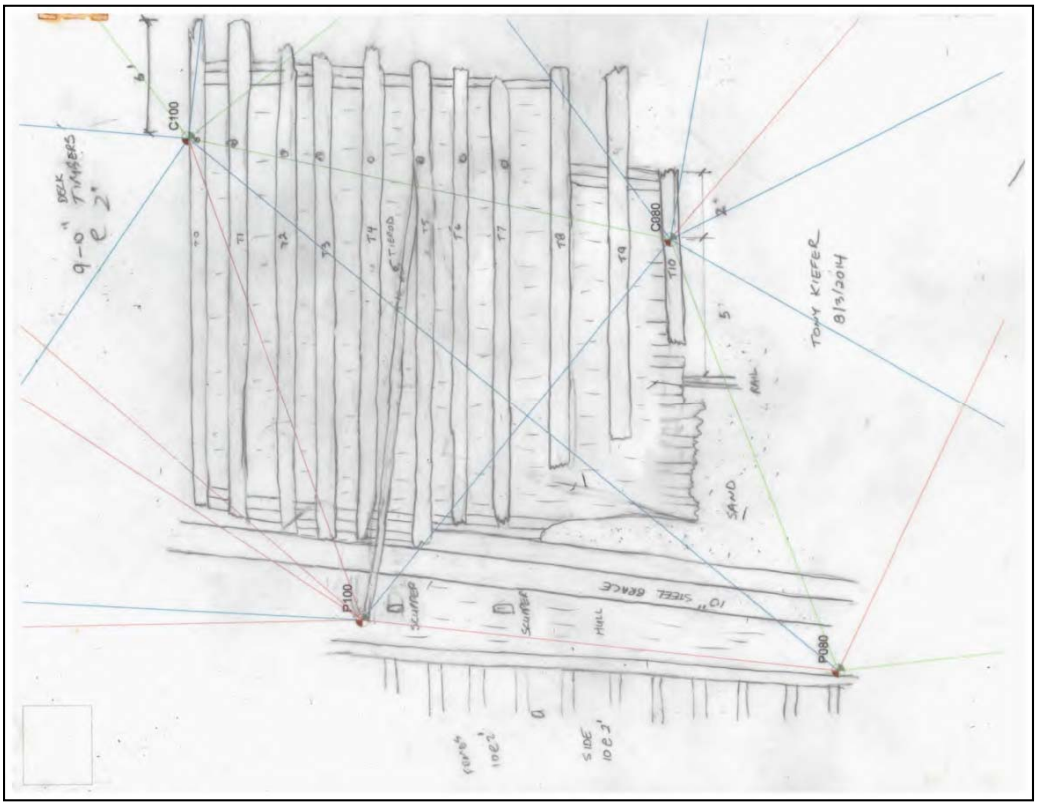


Figure 34 - Sectional Study of P100-C120 Based on Reference Tag Framework

The third diver, John Bell, created the intermediary drawing shown in Figure 35 based on his original set of notes, and then took that drawing on Mylar on a second dive to the same section. On that return visit he took additional notes and GoPro video as shown in Figure 36, and used the additional information to produce the final drawing shown in Figure 37.

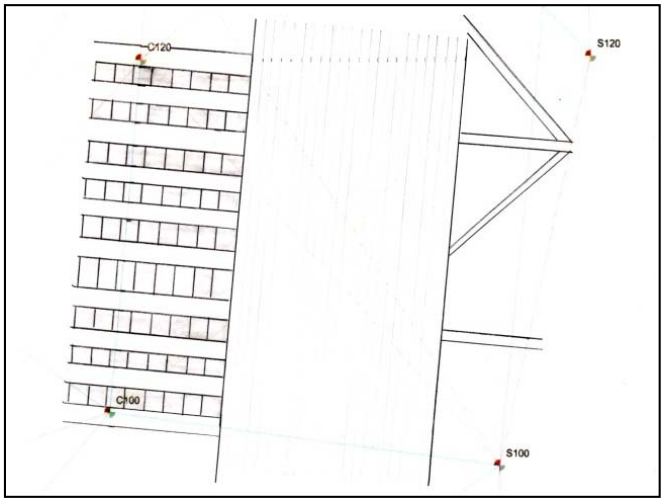


Figure 35 - Initial Drawing of C100 - S120

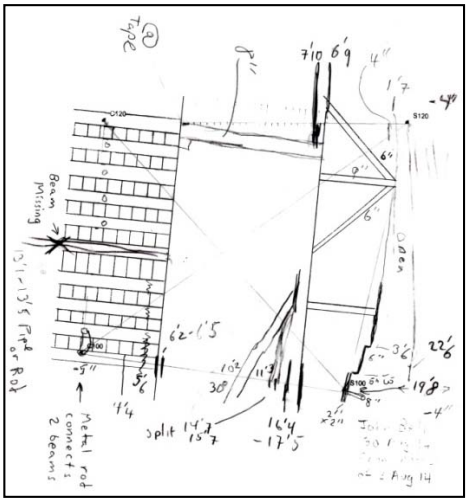


Figure 36 - 2nd Notes on C100-S120

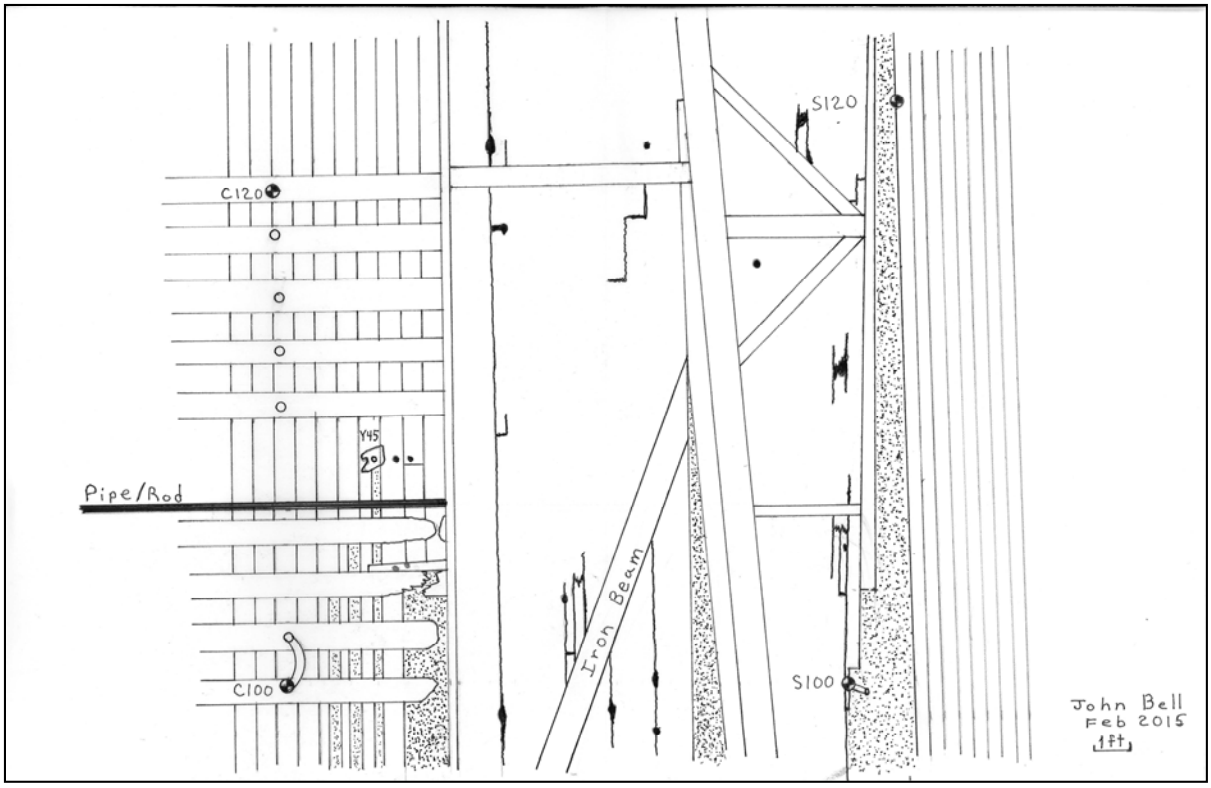


Figure 37 - Final Drawing of Section C100-S120, Based on Two Dives

By aligning the common reference tags between the three completed detailed drawings, the composite shown in Figure 38 was produced, with very little effort.

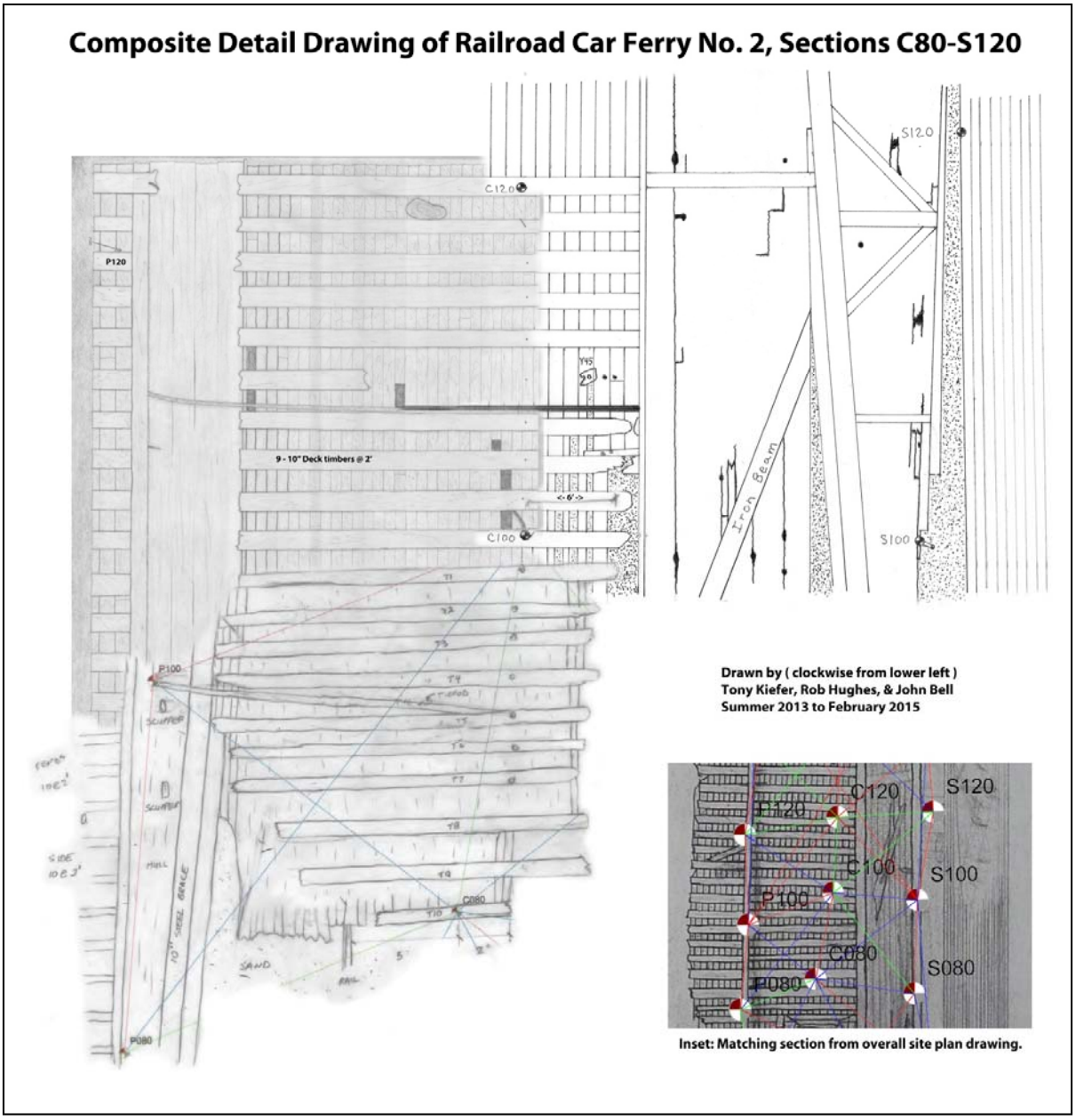


Figure 38 - Composite of Three Final Drawings, Covering P80 - S120, with Inset

Thanks to the reference tag grid system, there was no difficulty lining up the three sketches exactly, even though the three divers had very different styles, and in one case a different scale. This shows how valuable the reference tag system was for combining and integrating results from different surveyors, and opens the door for more than 30 future detailed site studies. This also shows how any diver of any ability or experience, (e.g. any beginning underwater archaeology student), can contribute to the project and have their contribution added to the growing detailed site plan.

Other Results From Direct Observation

The Western Chunk

While conducting the sidescan sonar survey discussed above, an extra piece of the wreckage was discovered as shown in Figure 39, affectionately named "The Western Chunk." Surveyors Robert Hughes and Julie Scheibe produced the sketch shown in Figure 40, and later a line was attached between the chunk and the main wreck site, to aid future divers and surveyors in finding the chunk and returning to the main site safely.

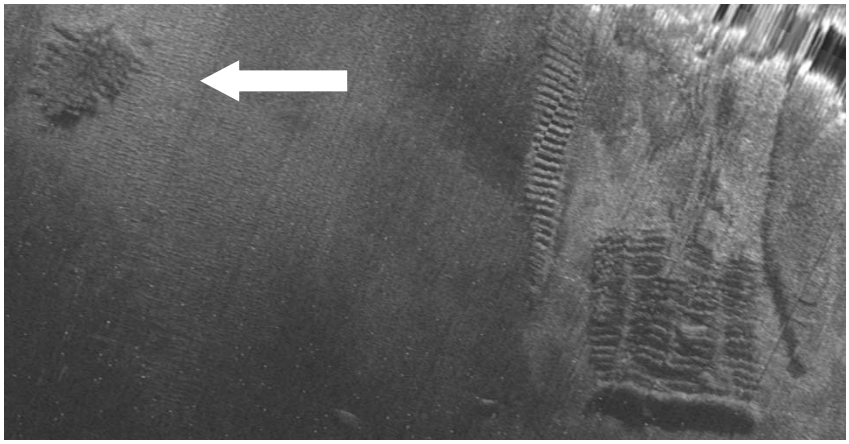


Figure 39 - Sidescan Image Revealing an Outlying Piece, Approximately 50' WNW of the Stern.

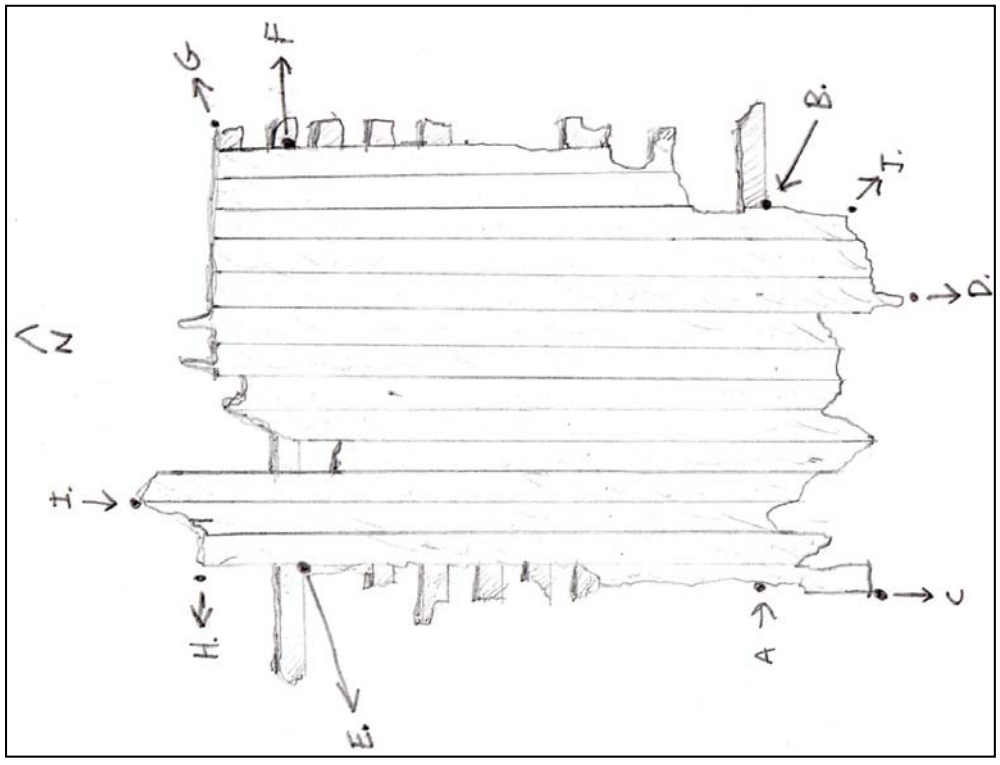


Figure 40 - Sketch of the Western Chunk by Hughes and Scheibe

The Bomb Blast

Another anomaly first discovered in the sidescan images is the hole shown in Figure 41 to Figure 43. Judging by the broken steel beam in the photo, this was not simple damage, but was more likely caused when a hole was blasted to sink it to the bottom of the lake, or later when it was further flattened to provide adequate clearance for passing ships.

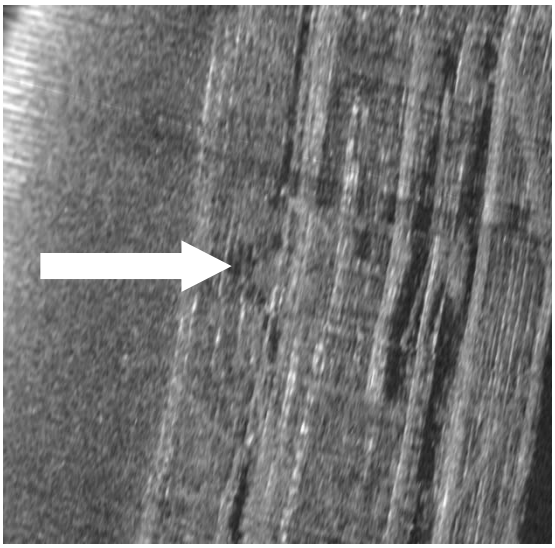


Figure 41 - Anomaly Originally Discovered in a Sidescan Sonar Image.

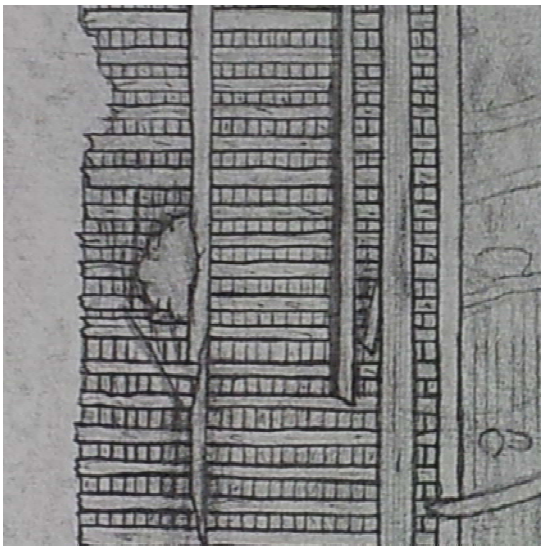


Figure 42 - Anomaly Shown in Site Plan Drawing.

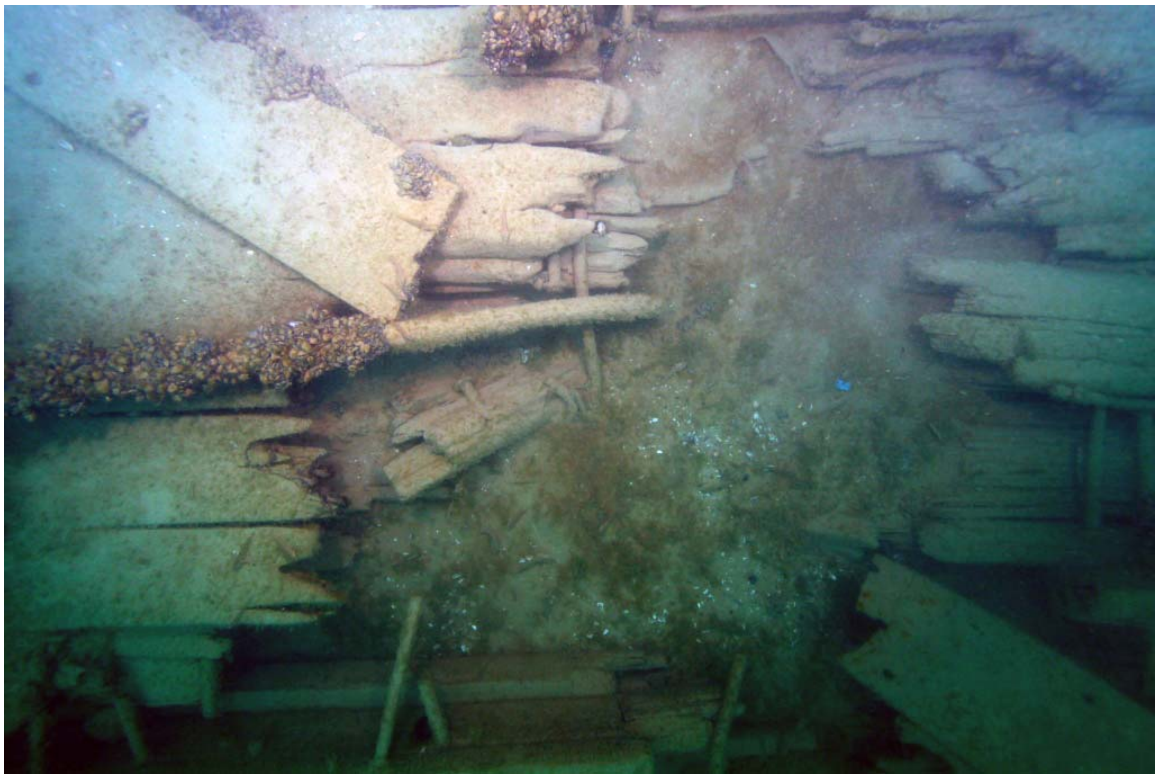


Figure 43 - Photo Reveals Damage Caused by an Explosive Blast.

Artistic Sketches

Renowned underwater artist Michael Angelo Gagliardi created the following detail sketches, based in part on the scene shown in the photograph in the upper left hand quadrant of Figure 44 (Photograph by Tony Kiefer).

Figure 44 - Artistic Sketches by Michael Angelo Gagliardi

Additional Survey Sketches

The following sketches are typical of the surveyor's original notes.

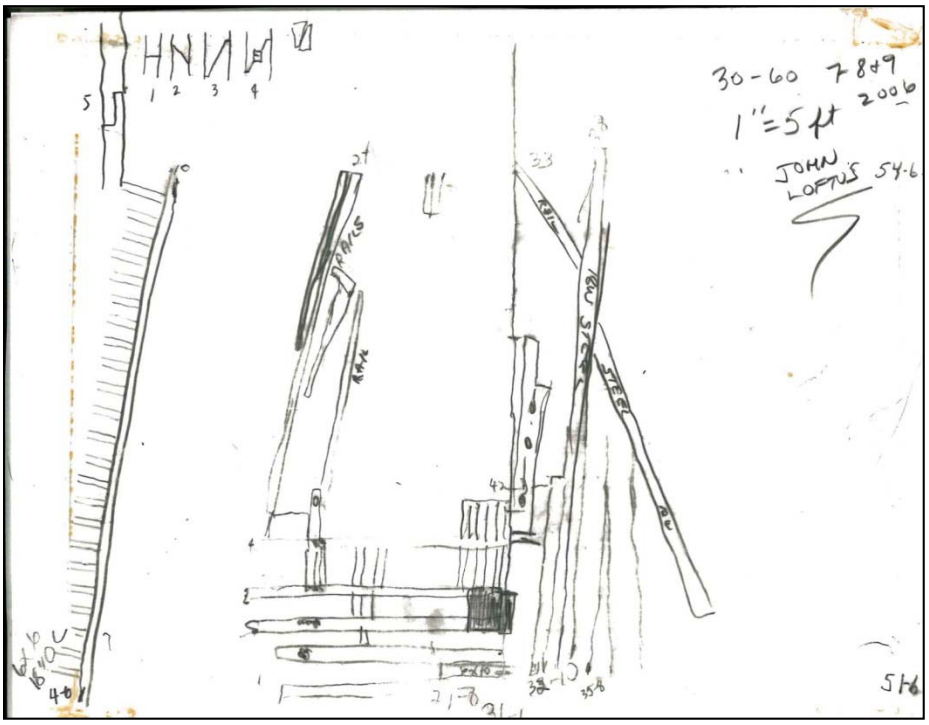


Figure 45 - Sketch of 30 to 60' Section with Joint Details

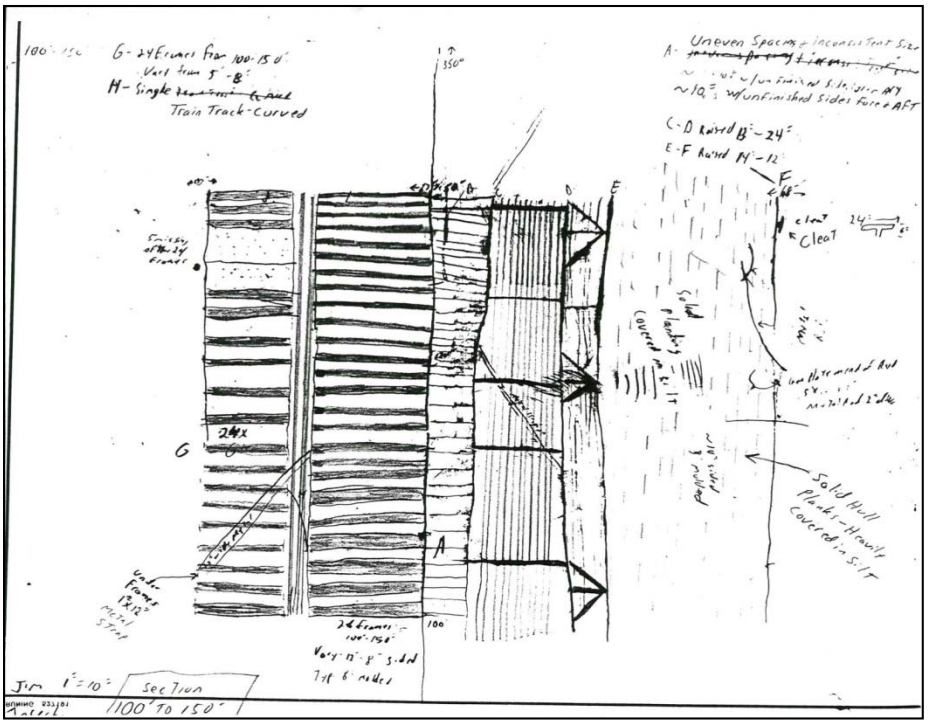


Figure 46 - Sketch of 100 to 150' Section with Notes

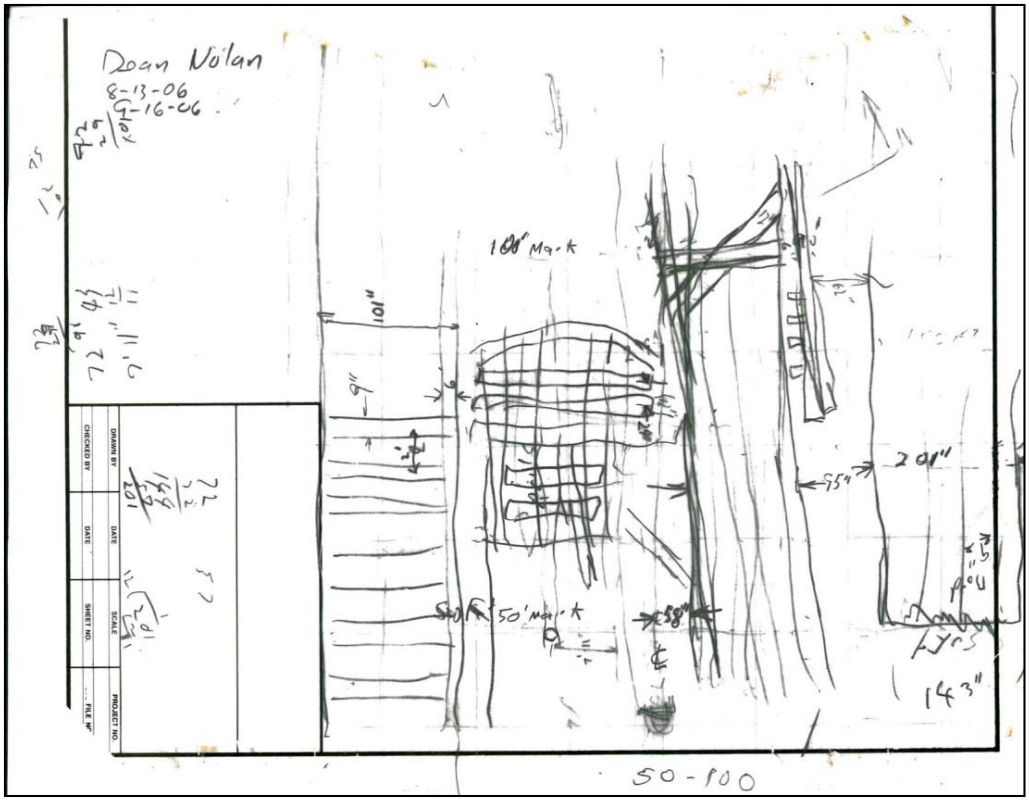


Figure 47 - Sketch of 50 to 100' Section

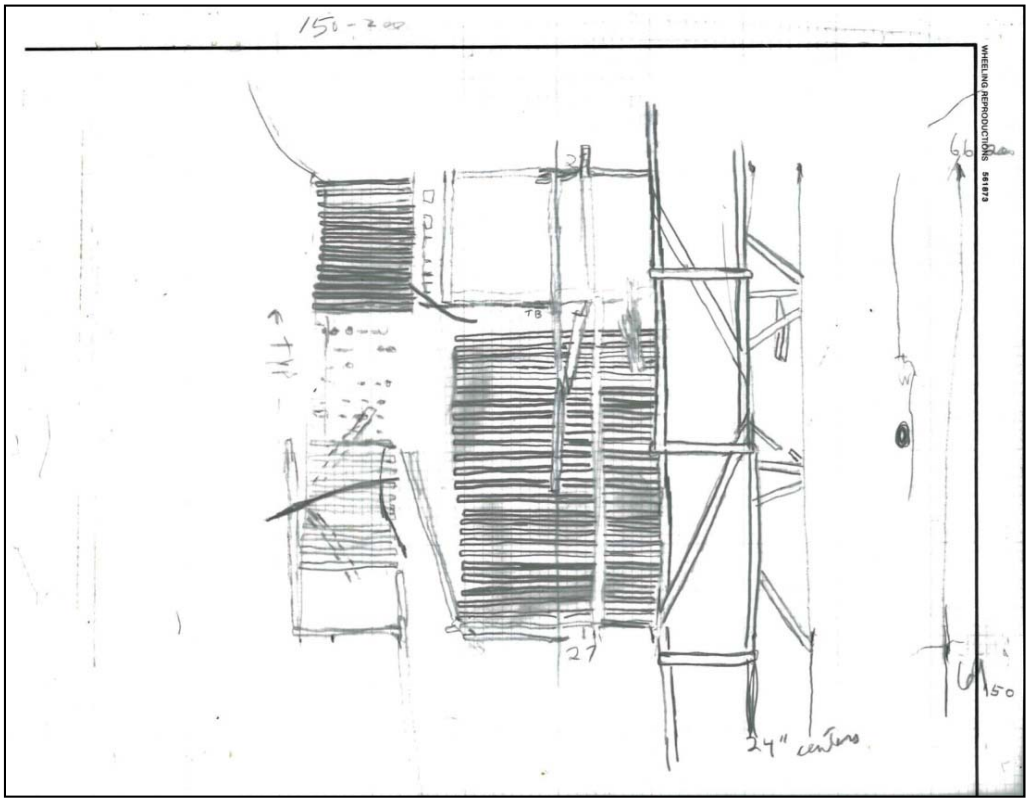


Figure 48 - Sketch of 150 to 200' Section

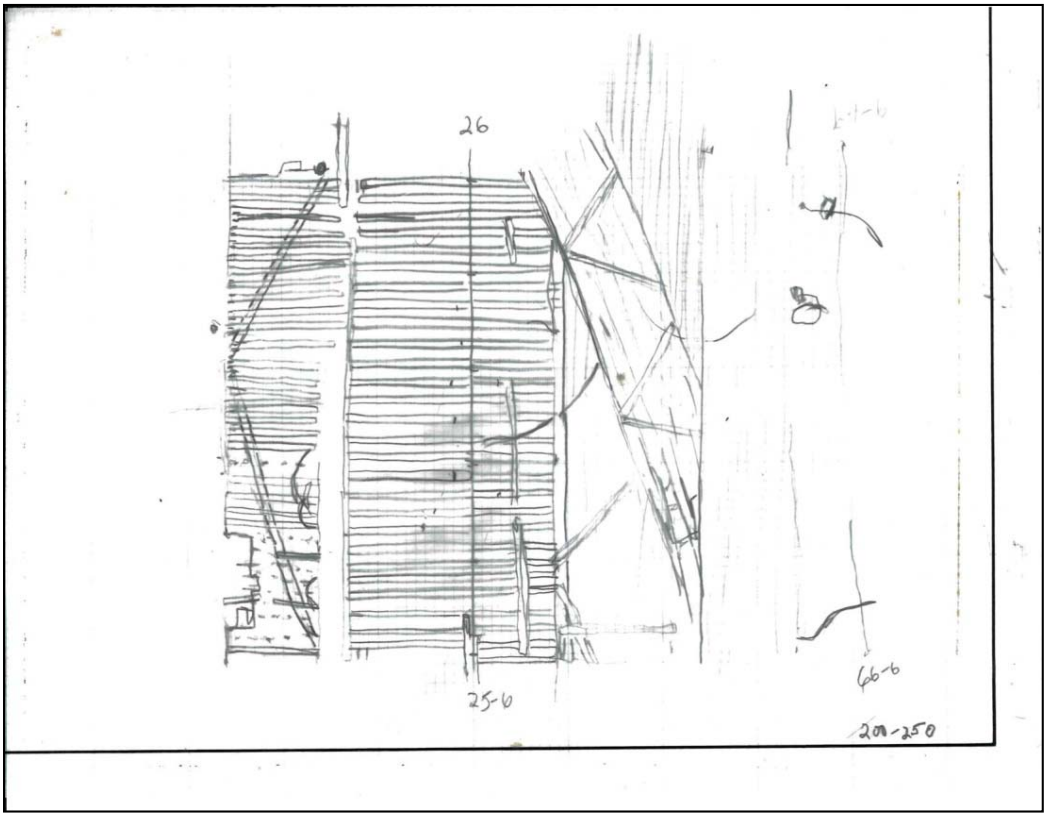


Figure 49 - Sketch of 200 to 250' Section

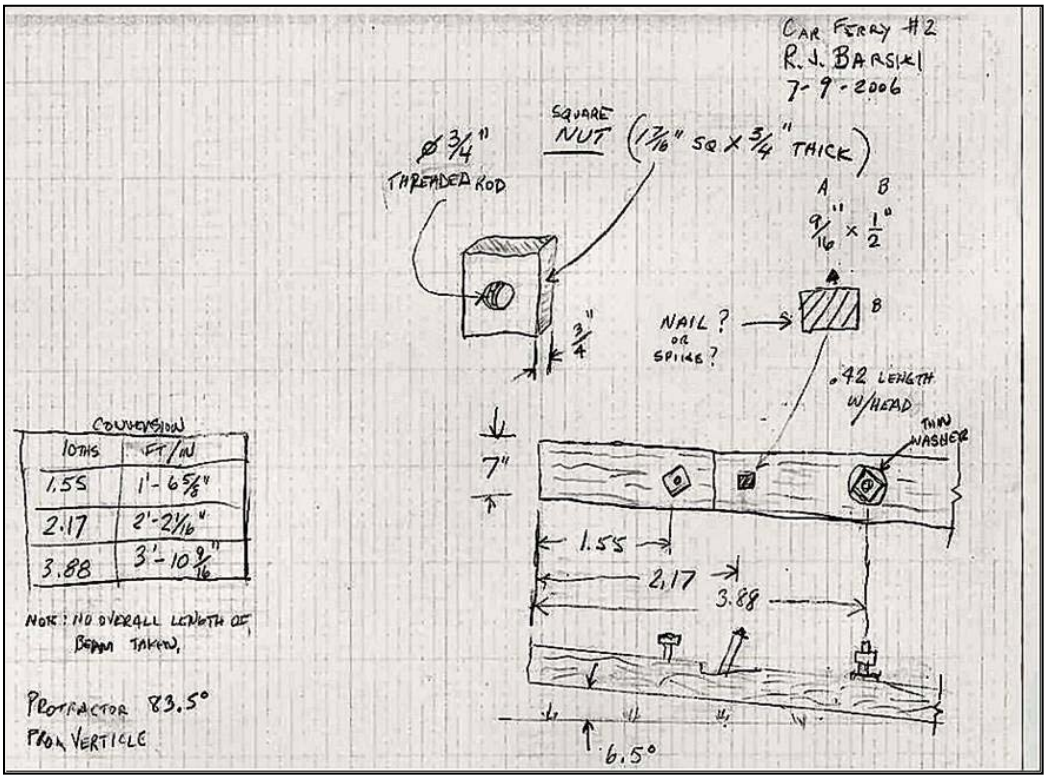


Figure 50 - Detail Sketch of Square Nut Fasteners

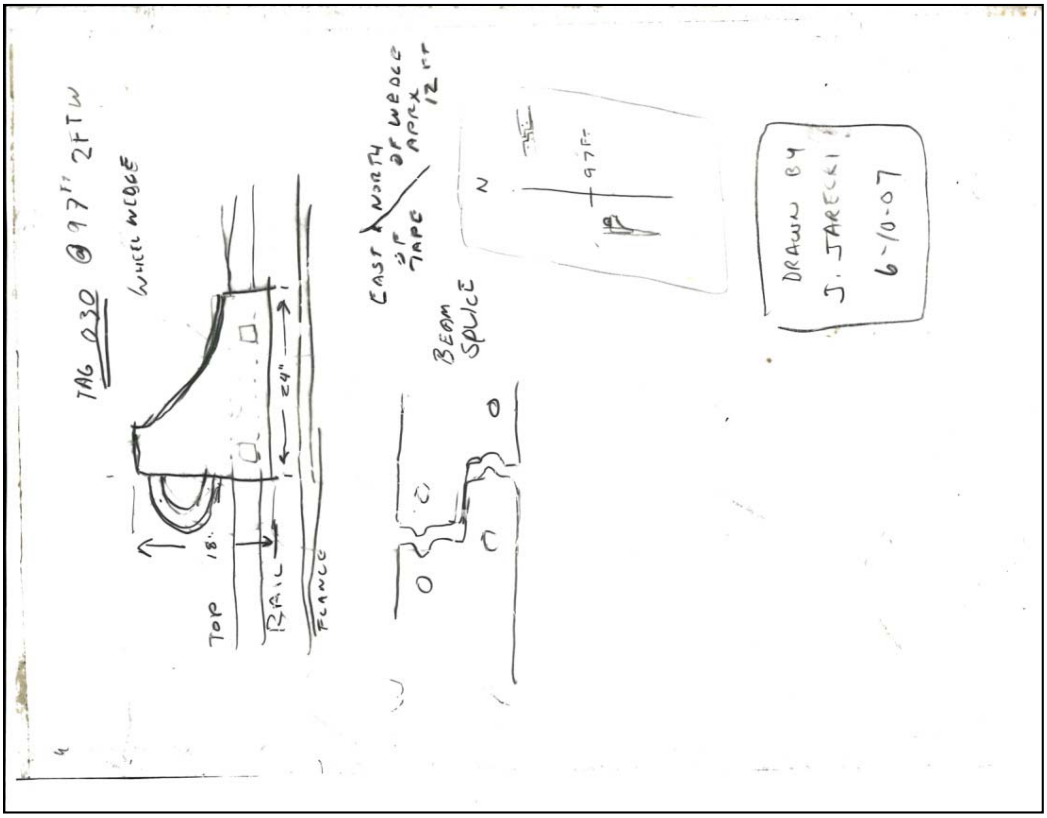


Figure 51 - Detail Sketch of Wheel Chock and Scarf Joint

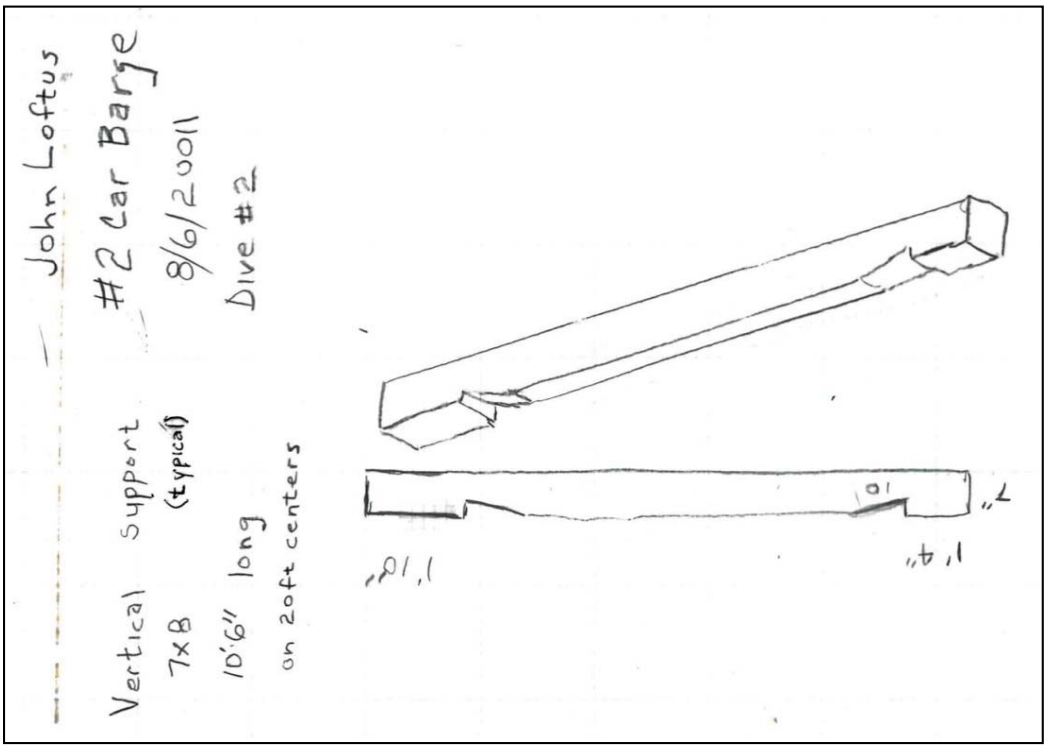


Figure 52 - Detail Sketch of Notched Beams

Artifacts, Features of Interest, and Their Locations

Numerous artifacts and other points of interest have been documented, based on the original baseline-offset coordinate system (i.e. before the reference tags were in place). In the table below, baseline distances are measured from the stern of the wreck towards the bow, and the P or S in the offset measurement refers to the port or starboard side as viewed from a diver swimming over the wreck, (ignoring the fact that the wreck is actually upside down). The tag number refers to a yellow plastic documentation tag affixed to certain artifacts, and the Figure number refers to the images that follow.

Feature	Tag	Baseline	Offset	Figure
Cleat	142	216'	37'2" S	
Crank	35	269' 3"	2' 7" S	44, 53
Diagonal Steel Strapping		131' 6"	9' 9" S	53
Metal Rod	145			53
Pulley	39	35' 10"		
Rail		~ 60'	Numerous	53
Rail Clamp	38	97' 3"	3' 8" P	24, 51, 54
Scarf Joint		135' 9"	12' 6" S	45, 51, 54
Screw Jack	141	57' 9"	8' 4" S	24, 54
Scupper		170' 7"	32' 6" S	54
Spikes				54
Standing Cable	36	238'	16' 11" P	55
Steel Plate w square nuts		45' 6"	24' 9" P	55
Turn Buckle	31	97'	32" P	23, 55
V-Brace		20'	0	19, 55
Wood Beam w. Gouge	149	59 - 61'		52

Table 4 - Documented Artifacts and Features of Interest

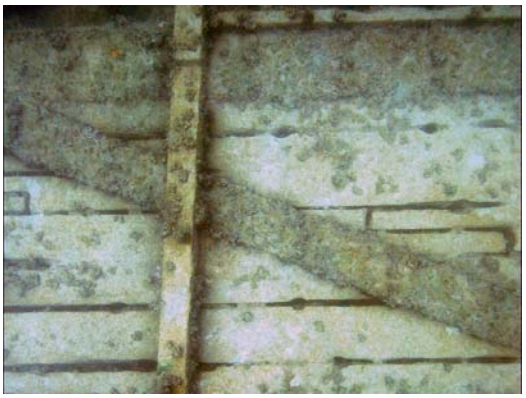
	
Crank, and Wire Coil	Diagonal Steel Strapping
	
Metal Rod With Plates and Nut	Metal Rod with Plate and Nut
	
Rail 1	Rail 2

Figure 53 - Documented Artifacts, Page 1 of 3

Rail Clamp

Scarf Joint

Screw Jack (In Use on L, In Situ on R)

Screw Jack

Scupper

Spikes

Figure 54 - Documented Artifacts, Page 2 of 3

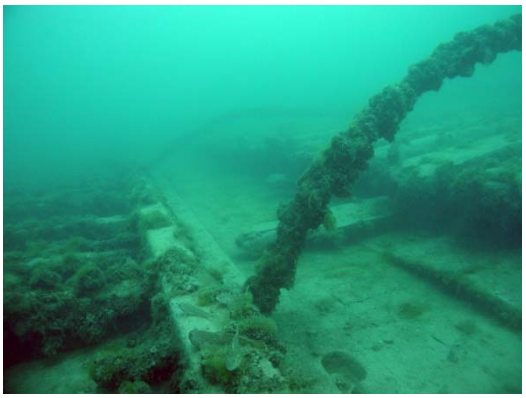
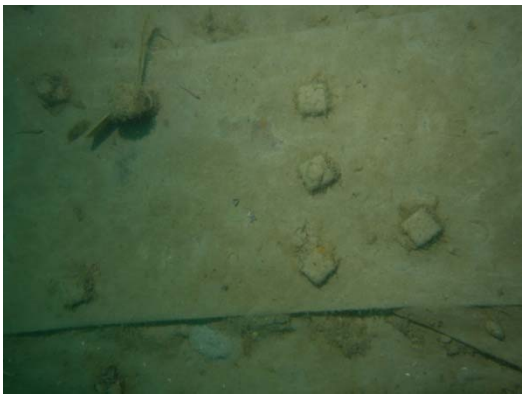
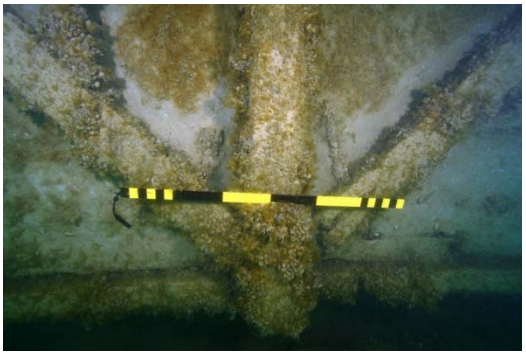
	
Standing Cable	Steel Plate with Square Nuts
	
Turn Buckle 1	Turn Buckle 2
	
V-Brace	“W” Side Support Structure

Figure 55 - Documented Artifacts, Page 3 of 3

Action Photos

The following are some of our favorite images of the survey team in action.

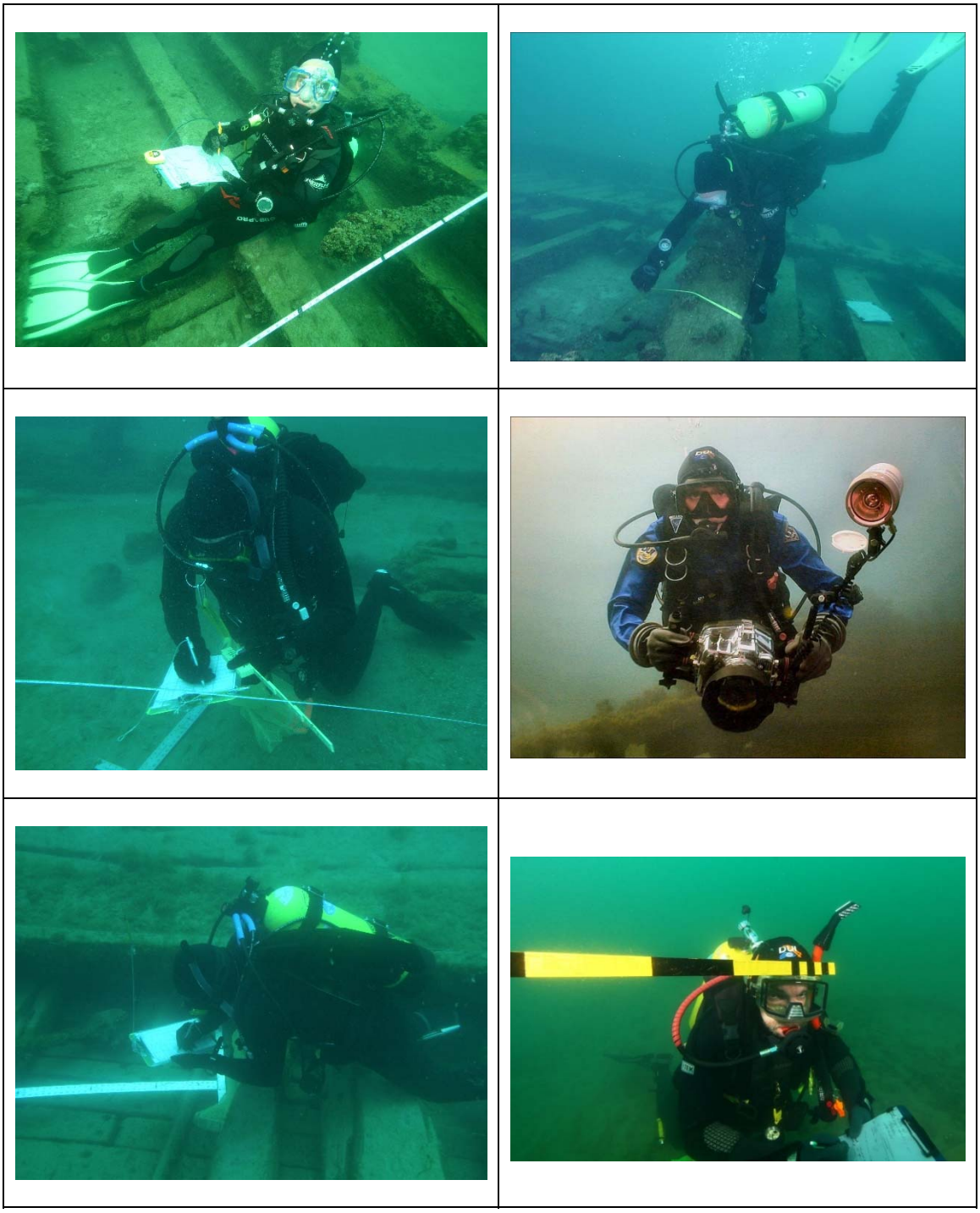


Figure 56 - Images of Surveyors in Action

Discussion of Results and Conclusions

Although the schedules of volunteers compounded by the vagaries of weather conditions on Lake Michigan did not provide for very many excursions per year, in the end, good results were obtained. The overall site plan drawing produced shows good detail, and matches very well with the detailed measurements of the reference tag system and with direct observation.

The reference tag system proved to be very useful, both as a navigational aid to new visitors (surveyors) to the wreck site, and more importantly, as a framework to support detailed site section studies and the combination thereof.

Three detailed section studies have been completed and combined, and the framework is in place to complete more than 30 additional studies. (Close to 60 additional studies could be conducted, if the sections of the site outside the bounds of the grid but still within range to be referenced to the grid are included.)

Extensive photo and video recordings of the site were captured, suitable for documentation of the current state of the site and for comparison with past and future studies. All recordings, including photo, video, and sidescan data, have been fully cataloged and archived, and will be made available to future researchers upon request. More than 40 participants have had a chance to contribute to this work, many of whom had little or no experience with underwater archaeology prior to their involvement with this project. Their training has been invaluable, both to those receiving the training and to those who trained them.

Recommendations for Future Work

Now that the overall survey is completed, there are additional opportunities for follow-up studies covering specific sections of the site in greater detail. To allow for the possibility for future survey and monitoring, it is strongly recommended to leave the reference tag system in place now that this overall study is completed. Such a baseline system will allow for more efficient and effective monitoring studies, as well as serving as a navigational aid for recreational divers. As a follow-up to this study, it is also planned to produce a dive slate describing the site, documenting the history and cultural significance of the site, as well as the general locations of non-movable features of interest.

As mentioned above, the reference grid system defines 34 roughly rectangular sections (plus 2 triangular ones) only three of which have been studied in detail. This leaves over thirty sections defined within the grid system for future detailed studies, plus another 35 or so along the edges. At only 40 feet deep with a basically flat profile having few if any obstructions or entanglement hazards, the site is a perfect workspace for beginning divers/surveyors. The only real danger was navigation, on a site that is over 300 ft long and very similar in appearance over much of its range (particularly in low-visibility situations). However, the reference grid system has relieved that danger, providing a "roadmap" of navigational markers. As a result, the site now provides a perfect classroom setting for teaching and practicing underwater archaeological survey techniques, and it is recommended that the site be an opportunity to be used for that purpose. As long as the reference tags remain in place, any new studies can be easily combined with the three already completed, and reference to the overall site plan drawings.

Key Personnel

Actual survey operation has been conducted by numerous volunteers, primarily members and friends of the Underwater Archaeological Society of Chicago. In addition, the following individuals constitute the leadership of this project:

Kira E. Kaufmann – Project Liaison (Ph.D., RPA, AAUS)

Dr. Kaufmann is a Professional Archaeologist, and the project liaison of this project. She assisted with project coordination between the project team and the Indiana Division of Historic Preservation and Archaeology (DHPA).

Dr. Kaufmann has been an archaeologist for over 25 years in cultural resource management, for state government, in academia, and in public archaeology. She holds a BA, MA, and Ph.D. in Anthropology, specializing in landscape archaeology and archaeogeophysics, or the archaeological application of technology such as ground penetrating radar, resistivity, conductivity, sidescan sonar, three-dimensional sonar, magnetometry, and sub-bottom profiling. Her master's thesis research, while at Florida State University, focused on the prehistoric occupation of caverns and caves that are now underwater in a karst sinkhole/cavern system in north Florida. Her doctorate research focused on the spatial analysis of Effigy Mound sites from the Late Woodland period using geophysical remote sensing survey. Her current research interests address the landscape archaeology of terrestrial earthworks, such as mounds, and submerged sites, such as shipwrecks. She has conducted Archaeological projects in the Midwest and Southeast United States, in northern and southern Peru, in Africa, and in Southeast Asia. Dr. Kaufmann has directed underwater archaeological projects at both prehistoric and historic sites. Dr. Kaufmann is a NAS instructor, SCUBA instructor and technical SCUBA diver with numerous advanced certifications. She is currently the President of the Wisconsin Archeological Survey, the professional archaeological organization in Wisconsin.

Kevin Cullen - Project Archaeologist and NAS Instructor (MS.)

Kevin was born and raised in Ireland, yet educated in Wisconsin from High School through Graduate School. He holds two Bachelor of Science degrees from UW-Madison (2002) and two Master of Science degrees (2008) in Anthropology and Museum Studies from UW-Milwaukee. Kevin has conducted dozens of archaeological excavations, both on land and underwater, throughout the United States, as well as internationally in India and Ireland.

In October 2013, Kevin joined the Neville Public Museum (Green Bay, WI) staff as Curator, after serving six years as the Archaeology Project Director at Discovery World museum in Milwaukee, WI. In 2015, Kevin became the museums Deputy Director and is responsible for overseeing exhibition development, educational programming and event planning. In addition to his museum duties, Kevin is the president of the Wisconsin Underwater Archaeology Association (2012 - present) and senior instructor for the Nautical Archaeology Society (2012 - present). To date, he has presented at numerous conferences, and has authored dozens of professional articles and archaeological reports.

UASC Project Members

The following key project members are all members of the Underwater Archaeological Society of Chicago, UASC, and are all certified SCUBA divers. All except Ruth have Advanced, Wreck, and Solo diving training and experience, with over 10 years and 200 dives experience each, and each have also completed the NAS I Underwater Archaeology training course. John Loftus, John Bell, Jim Jarecki, and Robert Hughes are working on this project in partial fulfillment of their NAS II certification. (John Gerty is completing his NAS II certification on a different project).

John Loftus

John is the local Project Leader for this project. John collected and compiled all documentation regarding this project, and oversaw day-to-day operations and planning. John was also one of the key divers and boat captains working on this project.

John Bell

Dr. Bell was responsible for the sidescan sonar operations and reference grid sub-projects. John was also one of the key divers and boat captains working on this project, and the primary author of this report.

Jim Jarecki

Jim Jarecki was the principal historian for this project, in addition to being one of the key divers involved.

Ruth Loftus

Ruth conducted additional historical research for this project, as well as providing surface support during dive operations.

John Gerty

John was one of the principal divers and research historians for the project, in addition to doing data analysis and sketch work.

Robert Hughes

Robert was a Sketch Artist for this project, conducting sketches underwater in-situ and also working on land to convert collected measurements into comprehensible images.

Additional Participants/Photo Gallery

The authors would like to sincerely thank everyone who helped work on this major project, either in the water, in the boat, in the library, or wherever or however they helped. We could not possibly have done it without everyone's help.

Project Leaders

 John Loftus	 Ruth Loftus	 John Bell	 John Gerty
 Jim Jarecki	 Robert Hughes	 Kira Kaufmann	 Kevin Cullen

Figure 57 - Project Leaders

Additional Divers

Listed in order of decreasing number of dives, or alphabetical when tied.

 Tony Kiefer	 Dean Nolan	 Scott Reimer	 Mark Engelsman

Figure 58 - Additional Divers, Part 1 of 2

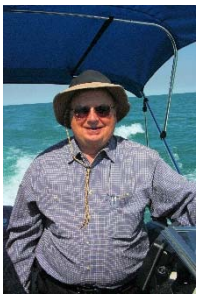
 Jeff Rouse	 Roger Barski	 Jerry Boldenow	 Yoseph Mendelsohn
 Julie Scheibe	 Tom Chemler	 Don Doherty	 Michael A. Gagliardi
 Jason Martin	 Bill Messner	 Bob Rushman	 Bob Gadbois
 Claire Gadbois	 Eric Vaandering	 Cris Kohl	 Mike Malone

Figure 59 - Additional Divers, Part 2 of 2

Not Pictured: Jack Donoval

Additional Surface Support

 Victor Banks	 Buckner Bell	 Kat Bell	 Jack Bolous
 Larry Carani	 Susan Carter	 Chet Childs	 Dan McIntyre Jr.
 Tate Nichols	 Mark Niewohner	 Sam Polonetzky	 Jackie Rae

Figure 60 - Additional Surface Support

Not Pictured: Howard Openlander

Photo Credits

Most of the participants listed above took photos or videos at some point. Of special note are Tony Kiefer, John Gerty, Bob and Claire Gadbois, Rob Hughes, Scott Reimer, John Loftus, Jim Jarecki, John Bell, and Cris Kohl.

All together more than 15 CD's full of still and video images were captured during the course of this project. The exact number is uncountable, and unfortunately it is not always clear exactly which photographer captured which image.

Our thanks go out to all photographers and videographers for the generous use of their images in this report.

References/Bibliography

[1] *1906*, Available: https://en.wikipedia.org/wiki/1906.

[2] Robert W. Graham, Archivist, *Historical Collections of the Great Lakes*, Bowling Green State University, Bowling Green, OH, Available: http://www.bgsu.edu/library/cac/collections/hcgl.html.

[3] George W. Hilton, *The Great Lakes Car Ferries*, Howell-North Books, Berkeley, CA, 1962.

[4] Richard McLeod, "History of the Wisconsin and Michigan Railway," in *The Railway and Locomotive Historical Society Bulletin*, vol. 118, 1968, pp. 7-20.

[5] *History of the Wisconsin and Michigan Railway*. Available: http://www.user.pids.netvindalu/W+M/prototype2.htm, (Same as reference [4]).

[6] in *Chicago Inter Ocean*, Chicago, IL, 1906.

[7] *Annual Report of the Operations of the United States Life-Saving Service for the Fiscal Year Ended June 30 1907*, Washington Government Printing Office, Washington, DC, 1908, pp. 45-46, 100, 403.

[8] in *Chicago Tribune*, Chicago, IL, 30 Sept 1906.

[9] in *Buffalo News*, Buffalo, NY, 1 Oct 1906 and 8 Oct 1906.

[10] "Letters between Lieutenant Colonel William H. Bixby, Corps of Engineers, U.S. Army and the Lake Michigan Car Ferry Transportation Company and the Great Lakes Dredge and Dock Company," in *Chicago District Project Files Relating to Rivers and Harbors in Illinois and Northwest Indiana, 1904-1907*, Boxes 378-380, National Archives and Records Administration, Chicago, IL.

[11] in *Chicago Inter Ocean*, Chicago, IL, 1907.

[12] Gary D. Ellis, *Preliminary Evaluation of the Car Ferry No. 2, Marine Cultural Resources Site No. 10, Lake County, IN*, Indiana Department of Natural Resources, Indianapolis, IN Marine Cultural Resources Report No. 6, Marine Cultural Resources Site No. 10, 1987.

[13] Kira E. Kaufmann, *Report of Investigations of Submerged Cultural Resources within Indiana's Territorial Waters of Lake Michigan*, Commonwealth Cultural Resources Group, Inc., Milwaukee, WI, R-0923, 2011.

[14] A. Bowens, *Underwater Archaeology - The NAS Guide to Principles and Practice*, Blackwell Publishing, Malden, MA, 2009.

[15] *What is Humminbird PC FAQ*, Available: http://www.humminbird.com/Category/Support/FAQ/HumminbirdPC/.

[16] *Humminbird PC Downloads*, Available: http://forums.sideimagingsoft.com/index.php?topic=95.0.

[17] mrj9600, *Humviewer - Viewer of Humminbird Files*, Available: http://forums.sideimagingsoft.com/index.php?topic=155.0, Accessed 13 May 2009.

[18] Tore Leraand, *Sonar TRX Web Site*, Available: http://www.sonartrx.com/web/.

[19] *Google Earth Web Site*, Available: https://www.google.com/earth/.

[20] *Adobe Photoshop Web Site*, Available: http://www.adobe.com/products/photoshop.html.

[21] *Site Recorder Web Page*, Available: http://www.3hconsulting.com/ProductsRecorderMain.html.

[22] Captain James Davidson, *History of the Great Lakes*, Available: http://www.halinet.on.ca/GreatLakes/Documents/HgL2/default.asp?ID=s265.

[23] Brendon Baillod, *Great Lakes Shipwreck Research*, Available: http://www.ship-wreck.com/shipwreck/, Accessed 13 January 2012.

[24] *Rails Across the Water*, Michigan Hisotry Magazine, Available: http://www.michiganhistorymagazine.com/extra/transportation/rails/rails_across_water.html, Accessed 12 July 2006.

[25] *Great Lakes Marine Collection, Ship Information and Data Records*, Milwaukee Public Library and Wisconsin Marine Historical Society, Milwaukee, WI.

Research Sources

1. Chicago Public Library
2. Chicago History Museum
3. Daley Library, University of Illinois, Chicago.
4. Great Lakes Historical Society
5. Joliet Public Library
6. Lockport Historical Society
7. Milwaukee Public Library
8. National Archives, Chicago.
9. S.S. Milwaukee National Historic Landmark
10. Thunder Bay Research Center, Alpena, MI

Appendices

Appendix A - Dive Log Summary

Year	Date	Dives	Excursions	Total Dives
2006	8-Jul-06	6	9	46
	9-Jul-06	3		
	15-Jul-06	6		
	29-Jul-06	6		
	5-Aug-06	8		
	13-Aug-06	5		
	19-Aug-06	4		
	16-Sep-06	6		
	1-Oct-06	2		
2007	28-May-07	2	3	13
	10-Jun-07	7		
	8-Jul-07	4		
2008	31-May-08	2	2	5
	16-Aug-08	3		
2009	29-May-09	2	2	3
	20-Jun-09	1		
2010	25-May-10	4	5	21
	29-May-10	4		
	10-Jun-10	4		
	17-Jul-10	6		
	1-Aug-10	3		
2011	8-Jun-11	8	6	45
	6-Aug-11	13		
	11-Aug-11	8		
	19-Aug-11	6		
	3-Sep-11	5		
	11-Sep-11	6		
2012	20-May-12	1	9	34
	27-May-12	5		
	10-Jun-12	4		
	24-Jun-12	4		
	13-Jul-12	6		
	16-Jul-12	6		
	29-Jul-12	3		
	19-Aug-12	10		
	29-Aug-12	2		
	16-Sep-12	3		
2013	8-Jun-13	2	4	19
	22-Jun-13	1		
	16-Aug-13	8		
	14-Sep-13	8		
2014	1-Jun-14	3	3	12
	29-Jun-14	6		
	3-Aug-14	3		
	31-Aug-14	3		
	Total	212	45	212

Table 5 - Complete Dive Summary by Year

Table 6 - Complete Record of all Logged Dives

Date	Diver	Dive #	Activities & Notes
8-Jul-06	J. Bell	1	Sketched stern section. Measured cross distances full length. Take general measurements & draw 0-30 section
8-Jul-06	J. Bell	2	Make a series of x-measurements 2 stern
8-Jul-06	J. Loftus	1	Laid out 300' CL tape. Sketched 30-60' section. Install mooring bottle along center line @ 90
8-Jul-06	J. Loftus	2	Sketched 30-60' section. Documented construction details. Draw 30-60 section. Observe steel strapping on inside of hull.
8-Jul-06	T. Kiefer	1	Photomosaiced. Photograph 0-150
8-Jul-06	T. Kiefer	2	Photograph 150-300
9-Jul-06	J. Loftus	1	Measured. Documented features. Swam drop camera. Make several x-measurements.
9-Jul-06	J. Loftus	2	Documented features. Picked up 2 cross tapes from yesterday. Laid down center tape. Site 65+ ft wide
9-Jul-06	R. Barski	1	Documented details of construction - bolts & joints. Clean Beam. Draw & document hardware
15-Jul-06	J. Jarecki	1	Lay tapes draw 100-150 section Sketched 100-150. Documented features.
15-Jul-06	J. Jarecki	2	Continue drawing 100-150. Added detail on starboard side.
15-Jul-06	J. Loftus	1	Laid cross tapes at 100 and 150 from stern. Continue drawing 150-200
15-Jul-06	J. Loftus	2	Continue drawing 150-200 document camming device @ bow. Picked up tapes.
15-Jul-06	T. Kiefer	1	Lay x-tape @ 50. Shoot Photomosaic of port side.
15-Jul-06	T. Kiefer	2	Photomosaic of starboard side and cross lines.
29-Jul-06	J. Jarecki	1	Finish drawing 100-150
29-Jul-06	J. Jarecki	2	Picked up tapes. Shot photos of cleat & Wheel stop.
29-Jul-06	J. Loftus	1	Continue drawing 150-200
29-Jul-06	J. Loftus	2	Finish drawing 150-200
29-Jul-06	R. Barski	1	Visual survey 0-90
29-Jul-06	R. Barski	2	Draw scarf @100 port side
5-Aug-06	D. Nolan	1	Continue drawing 50-100
5-Aug-06	D. Nolan	2	Added detail to 50-100 survey drawing.
5-Aug-06	J. Donoval	1	Video document stern
5-Aug-06	J. Donoval	2	Video document 50-100 port side
5-Aug-06	J. Loftus	1	Continue drawing 200-250

Date	Diver	Dive #	Activities & Notes
5-Aug-06	J. Loftus	2	Continue drawing 200-250
5-Aug-06	T. Kiefer	1	Sketched stern section 0-50
5-Aug-06	T. Kiefer	2	Continue drawing 0-50
13-Aug-06	D. Nolan	1	Lay x-tapes @50 & 100. Start drawing.
13-Aug-06	D. Nolan	2	Continue Drawing 50-100
13-Aug-06	J. Loftus	1	Drawing 200-250
13-Aug-06	M. Gagliardi	1	Photo-montage & draw. Shoot profile of stern.
13-Aug-06	M. Gagliardi	2	Photo-montage & draw weighted shaft @270
19-Aug-06	J. Jarecki	1	Extend center tape 300 to 336. Lay x-tape @ 320. Start drawing.
19-Aug-06	J. Jarecki	2	Continue drawing 300-336
19-Aug-06	J. Loftus	1	Continue drawing 250-300
19-Aug-06	J. Loftus	2	Continue drawing 250-300
16-Sep-06	D. Nolan	1	Document & draw stern
16-Sep-06	D. Nolan	2	Continue drawing stern
16-Sep-06	J. Loftus	1	Continue drawing 250-300
16-Sep-06	J. Loftus	2	Continue drawing 250-300
16-Sep-06	T. Kiefer	1	Survey & Draw stern 0-50
16-Sep-06	T. Kiefer	2	Continue survey 0-50
1-Oct-06	J. Loftus	1	Continue drawing 250-310
1-Oct-06	T. Kiefer	1	Photograph features. Cleat, rail, truss. Document scupper
28-May-07	J. Bell	1	
28-May-07	J. Loftus	1	
10-Jun-07	J. Gerty	1	Photograph features
10-Jun-07	J. Gerty	2	Photograph steel strapping
10-Jun-07	J. Jarecki	1	Draw wheel wedge & Beam splice
10-Jun-07	J. Loftus	1	Lay x-tapes @250 & 310. Draw
10-Jun-07	J. Loftus	2	Continue drawing 250-310
10-Jun-07	T. Kiefer	1	Swim photo-mosaic lanes.
10-Jun-07	T. Kiefer	2	More photo-mosaic
8-Jul-07	C. Gadbois	1	Photograph & document features
8-Jul-07	J. Loftus	1	Clean screw jack
8-Jul-07	R. Gadbois	1	Shoot video
8-Jul-07	T. Kiefer	1	Photograph screw jack & other features
31-May-08	J. Bell	1	
31-May-08	J. Loftus	1	Set bottles @ mid & stern
16-Aug-08	C. Kohl	1	
16-Aug-08	D. Nolan	1	

Date	Diver	Dive #	Activities & Notes
16-Aug-08	J. Bell	1	
29-May-09	B. Messner	1	
29-May-09	J. Bell	1	
20-Jun-09	J. Loftus	1	Set bottle @ bow. Photograph features.
25-May-10	J. Bell	1	
25-May-10	J. Bell	2	
25-May-10	J. Rouse	1	
25-May-10	J. Rouse	2	
29-May-10	J. Gerty	1	Photo document features. Screw jack, scarfs & structural details
29-May-10	J. Gerty	2	Shoot video, centerline to starboard.
29-May-10	J. Loftus	1	Locate features & measure offset from baseline
29-May-10	J. Loftus	2	Record 4 features
10-Jun-10	J. Bell	1	
10-Jun-10	J. Bell	2	
10-Jun-10	J. Rouse	1	
10-Jun-10	J. Rouse	2	
17-Jul-10	J. Gerty	1	Shoot video. Bow to stern port side. Shoot Lateral views of most vertical features
17-Jul-10	J. Gerty	2	Shoot video. Finish port side.
17-Jul-10	J. Jarecki	1	Tag features. Measure & document piece of sheet metal 146 ft from stern off port side.
17-Jul-10	J. Jarecki	2	Tag features using offset method.
17-Jul-10	J. Loftus	1	Tag features.
17-Jul-10	J. Loftus	2	Tag features.
1-Aug-10	J. Gerty	1	Video runs bow to stern
1-Aug-10	J. Jarecki	1	Tag features. Observe framing along inside hull port side.
1-Aug-10	J. Loftus	1	Tag features using offset method. 15 features tagged
8-Jun-11	J. Bell	1	Measured distances from points "B" and "C"
8-Jun-11	J. Bell	2	Completed measured from point "E". Photographed "A" to "H".
8-Jun-11	J. Gerty	1	Measuring.
8-Jun-11	J. Gerty	2	Measuring.
8-Jun-11	J. Gerty	3	Photographed. Collected core sample.
8-Jun-11	S. Reimer	1	Photograph.
8-Jun-11	S. Reimer	2	Tape cleanup and photographs
8-Jun-11	S. Reimer	3	Helped J. Bell measure, and photographed.
6-Aug-11	J. Bell	1	Take 4 measurements & photograph reference pts.

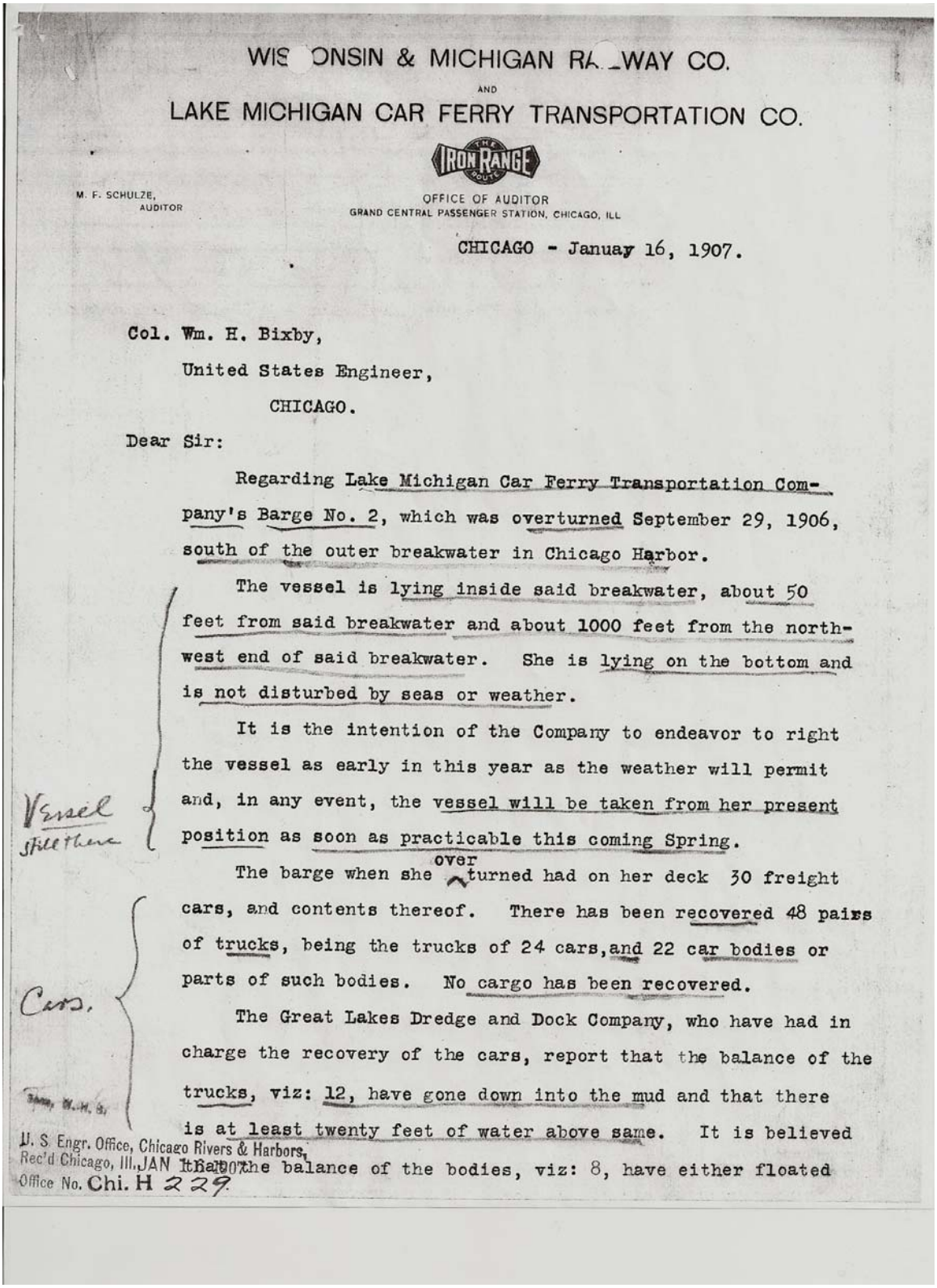
Date	Diver	Dive #	Activities & Notes
6-Aug-11	J. Bell	2	Trilateration of stern
6-Aug-11	J. Bell	3	Measure distances from pt. B & pt. C. Document.
6-Aug-11	J. Gerty	1	Assisting Bell
6-Aug-11	J. Gerty	2	Measuring reference pts
6-Aug-11	J. Gerty	3	Obtain core sample.
6-Aug-11	J. Jarecki	1	Measure several timber scarfs & document.
6-Aug-11	J. Jarecki	2	Make a measured cross section to record relief off bottom.
6-Aug-11	J. Loftus	1	Measure & document vertical support beams on inner hull.
6-Aug-11	S. Reimer	1	Photograph measurement pts. Clean up old tape
6-Aug-11	S. Reimer	2	Assist Bell w/measurement. Photo document.
6-Aug-11	S. Reimer	3	Assist Bell w/measurement. Photo document.
6-Aug-11	T. Kiefer	1	Photograph blast area & rails @ stern
11-Aug-11	D. Doherty	1	Placed CL tags 100 to 240 with J. Boldenow
11-Aug-11	D. Doherty	2	Worked with J. Boldenow laying CL tag
11-Aug-11	J. Bell	1	Place CL tape and tags C0, C20, C40, C60, C80, P0, S0. Ran port side tape to 300'
11-Aug-11	J. Bell	2	Placed P100, P200, P300, S100, S200, S300, S20, S40
11-Aug-11	J. Boldenow	1	Placed C100, C120, C140, C160, C180, C200, C220, C240
11-Aug-11	J. Boldenow	2	Placed CL tags to C340. Brought up CL tape.
11-Aug-11	J. Martin	1	Placed markers 30' off and 30' south of Port and Starboard stern corners, in preparation for planned sector scanning.
11-Aug-11	J. Martin	2	Placed more stakes off from site boundaries. Tagged features.
19-Aug-11	J. Bell	1	Placed P25, P40, P60, P80. Measured from P20, S40.
19-Aug-11	J. Bell	2	Measured from P60 and S40. Tagged and measured features.
19-Aug-11	J. Bell	3	Measured S60 to (S80, C60, C80, C40, S40), C60 to (C80, S80)
19-Aug-11	J. Jarecki	1	Assisted J. Bell with measurements at the stern.
19-Aug-11	T. Kiefer	1	Installed S80, 120, 140, 160. Photographed port features.
19-Aug-11	T. Kiefer	2	Placed starboard tags S180 to S240.
3-Sep-11	J. Bell	1	Moved C0. Measured C0 to (P0, P20, C20, S20, S0), S20 to (S0, C20, C40, S40), C60 to (S40, P80)
3-Sep-11	J. Bell	2	Measured from 60, and P80 to (P100, C80), C80 to (P100, C100, S100)

Date	Diver	Dive #	Activities & Notes
3-Sep-11	J. Boldenow	1	Dropped survey bag. No tasks completed.
3-Sep-11	M. Engelsman	1	Placed tags P120 to P280. Measured P200 to (P220, C220, C200), C200 to (P220, C220)
3-Sep-11	M. Engelsman	2	Measured from C200, P200, and C180. Replaced S200.
11-Sep-11	E. Vaandering	1	10 minute dive. No visibility.
11-Sep-11	J. Bell	1	Measured P100 to P140, P160. Replaced missing C100, C120 tags.
11-Sep-11	J. Bell	2	Measured P100 to S160. Measured S100 to S160, C160, C100, C120, S120, S140.
11-Sep-11	J. Gerty	1	
11-Sep-11	M. Engelsman	1	Replaced missing C200. Measured S200 to C200, C220, S220.
11-Sep-11	M. Engelsman	2	Measured P180 to P200, C200, P160, C160. Measured S160 to C160, S180, and C160 to S180.
20-May-12	J. Loftus	1	Install temp mooring bottle @ stern.
27-May-12	B. Rushman	1	Get Familiarized with wreck.
27-May-12	B. Rushman	2	Photo rails w/Gerty
27-May-12	J. Gerty	1	Locate & document blast zones on port side amidships
27-May-12	J. Gerty	2	Explore bow. Much more visible this year.
27-May-12	J. Loftus	1	Clean & prep rail.
10-Jun-12	J. Bell	1	Check & maintain tags @ bow
10-Jun-12	J. Bell	2	Inventory tags & identify missing tags
10-Jun-12	J. Loftus	1	Explore bow, locate rails
10-Jun-12	J. Loftus	2	Measure several rails, no difference. Sketch rail cross section
24-Jun-12	J. Gerty	1	Tag cleaning, maintenance, and inventory
24-Jun-12	J. Gerty	2	Photograph rails & ruler.
24-Jun-12	J. Jarecki	1	Replace missing P020 tag.
24-Jun-12	J. Loftus	1	Document rail @ bow.
13-Jul-12	J. Bell	1	Resolve tags @ bow
13-Jul-12	J. Bell	2	Tag maintenance & inventory
13-Jul-12	J. Gerty	2	Locate & measure tags C120, S120
13-Jul-12	J. Gerty	1	Locate & document debris approx 285 degrees & 90 ft from P40
13-Jul-12	T. Chemler	1	Get familiarized with wreck.
13-Jul-12	T. Chemler	2	Inventory tags
16-Jul-12	J. Bell	1	Check locations of port tags. Continue reference tag measurements
16-Jul-12	J. Bell	2	Continue reference tag measurements

Date	Diver	Dive #	Activities & Notes
16-Jul-12	J. Bell	3	Continue reference tag Measurements
16-Jul-12	J. Gerty	1	Continue reference tag Measurements
16-Jul-12	J. Gerty	2	Continue reference tag Measurements
16-Jul-12	J. Gerty	3	Continue reference tag Measurements
29-Jul-12	J. Gerty	1	Locate & replace tags C200, C180, S180, & take measures.
29-Jul-12	J. Gerty	2	More tags & measurements.
29-Jul-12	J. Jarecki	1	Tag inventory.
19-Aug-12	J. Bell	1	Check tags in 200 & above range
19-Aug-12	J. Bell	2	Finish placing tags @ bow 300 +
19-Aug-12	J. Gerty	1	Replace tag P025 & take measurements.
19-Aug-12	J. Gerty	2	Placed S080 tag & took measurements.
19-Aug-12	J. Loftus	1	Cleaned rail & made an impression in clay tablet
19-Aug-12	J. Loftus	2	Explored Western Chunk looking for signs of rail attachment
19-Aug-12	J. Scheibe	1	Get familiarized with wreck
19-Aug-12	J. Scheibe	2	Document Western Chunk
19-Aug-12	R. Hughes	1	Get familiarized with wreck
19-Aug-12	R. Hughes	2	Document Western Chunk
29-Aug-12	J. Loftus	1	Clean & prep rail. Try using contour Gauge
29-Aug-12	J. Loftus	2	Use contour gauge. Attempt making clay mold. Need heavier mallet
16-Sep-12	J. Scheibe	1	Video document bow section & port side
16-Sep-12	R. Hughes	1	Sketch bow section & port side
16-Sep-12	R. Hughes	2	Continue bow section sketch
8-Jun-13	J. Bell	1	Inventoried tags missing / present from previous year. Examined western chunk.
8-Jun-13	J. Gerty	1	Inventoried tags missing / present from previous year. Found wheel chock assembly at S60-S80.
22-Jun-13	J. Loftus	1	Cleaned some rail looking for #'s in webbing.
16-Aug-13	J. Bell	1	Found C0, C20, S0, S20, C60, C80. Replaced C40. Remeasured C40 to (C20, C60), C60-C80.
16-Aug-13	J. Bell	2	Found S100, S120. Replaced P140. Measured P140 to (P120, C120, C140, P160)
16-Aug-13	J. Bell	3	Replaced C160, C180, C220. Brought up old tape.
16-Aug-13	J. Bell	4	Placed final tags - S320, S340, P320. Measured S300 to S320, and C320 to (P340, C340, S340, S320)
16-Aug-13	R. Hughes	1	Drawing bow. Adding details to site plan, esp. starboard bow.

Date	Diver	Dive #	Activities & Notes
16-Aug-13	R. Hughes	2	Photography and video to improve site plan
16-Aug-13	R. Hughes	3	More photo & video data collection.
16-Aug-13	R. Hughes	4	Sketched notes for detail study of P100-C120 sector drawing.
14-Sep-13	J. Bell	1	Tag measurements. Tagged C360 at old post. Measured C280-C300, P340-C360.
14-Sep-13	J. Bell	2	Completed most measurements in 260 series, from 240 to 280.
14-Sep-13	J. Bell	3	Finished 260 series and P280-P300, P280-C280
14-Sep-13	J. Bell	4	3 measures, from C360 to (C340, S340, and C320)
14-Sep-13	J. Gerty	1	Measured P200 to C180 and C200. Called due to ear problems.
14-Sep-13	J. Mendelsohn	1	First dive on this wreck. Became familiar with wreck site.
14-Sep-13	J. Mendelsohn	2	Dropped survey bag on entry. Spent dive looking for it.
14-Sep-13	J. Mendelsohn	3	Called dive after 2 minutes due to leaking dry suit.
1-Jun-14	J. Bell	1	Continue tag measurements at bow.
1-Jun-14	J. Bell	2	Continue tag measurements at bow.
1-Jun-14	M. Malone	1	Familiarize with wreck site & take tag inventory.
29-Jun-14	J. Bell	1	Complete measurements at bow. Check old measurements
29-Jun-14	J. Bell	2	Measure artifact locations. Start sketch C-100 to S120
29-Jun-14	J. Gerty	1	Measure features relative to reference tags
29-Jun-14	J. Gerty	2	Photograph and document wheel chock at S60
29-Jun-14	J. Loftus	1	Remeasure and confirm parts dimensions
29-Jun-14	J. Loftus	2	Continue to confirm parts dimensions
3-Aug-14	J. Bell	1	Sketch C-100 to S120
3-Aug-14	J. Loftus	1	Measure features from reference tags. Document rail clamp #38
3-Aug-14	T. Kiefer	1	Sketched C100-P100 to C80-P80
31-Aug-14	J. Bell	1	Refine sketch C-100 to S120
31-Aug-14	J. Loftus	1	Locate features relative to location tags. Locate screw jack
31-Aug-14	J. Loftus	2	Locate features relative to reference tags

Appendix B - Correspondence Between the LMCFTC, U.S. Army Corps of Engineers, and the Great Lakes Dock and Dredge Company[10].



WIS ONSIN & MICHIGAN RA_WAY CO.
AND
LAKE MICHIGAN CAR FERRY TRANSPORTATION CO.

M. F. SCHULZE, AUDITOR

OFFICE OF AUDITOR
GRAND CENTRAL PASSENGER STATION, CHICAGO, ILL

CHICAGO - January 16, 1907.

Col. Wm. H. Bixby,
United States Engineer,
CHICAGO.

Dear Sir:

Regarding Lake Michigan Car Ferry Transportation Company's Barge No. 2, which was overturned September 29, 1906, south of the outer breakwater in Chicago Harbor.

The vessel is lying inside said breakwater, about 50 feet from said breakwater and about 1000 feet from the northwest end of said breakwater. She is lying on the bottom and is not disturbed by seas or weather.

Vessel still there

It is the intention of the Company to endeavor to right the vessel as early in this year as the weather will permit and, in any event, the vessel will be taken from her present position as soon as practicable this coming Spring.

The barge when she over turned had on her deck 30 freight cars, and contents thereof. There has been recovered 48 pairs of trucks, being the trucks of 24 cars, and 22 car bodies or parts of such bodies. No cargo has been recovered.

Cars.

The Great Lakes Dredge and Dock Company, who have had in charge the recovery of the cars, report that the balance of the trucks, viz: 12, have gone down into the mud and that there is at least twenty feet of water above same. It is believed that the balance of the bodies, viz: 8, have either floated

U. S. Engr. Office, Chicago Rivers & Harbors,
Rec'd Chicago, Ill. JAN 18 1907
Office No. Chi. H 229

WIS ONSIN & MICHIGAN RA..WAY CO.

AND

LAKE MICHIGAN CAR FERRY TRANSPORTATION CO.

M. F. SCHULZE,
AUDITOR

OFFICE OF AUDITOR
GRAND CENTRAL PASSENGER STATION, CHICAGO, ILL

away or remain under thebarge; probably some have floated away and some remain under the barge. The lading of the cars was of a character that would float, excepting that there were 14 carloads of iron ore in thecargo, all of which iron ore went to the bottom and disappeared in the mud.

Cargo

At the time work of recoveringwas stopped, the diver reported that there was nothing on the bottom of the harbor that would obstruct navigation, in fact, everything had disappeared.

Very truly yours,

W. J. Abbott
Vice President.

229.

LAKE MICHIGAN CAR FERRY TRANSPORTATION CO.

THE IRON RANGE ROUTE

M. F. SCHULZE,
AUDITOR

OFFICE OF AUDITOR
GRAND CENTRAL PASSENGER STATION, CHICAGO, ILL

Chicago, July 6th, 1907.

Lieutenant Colonel, Wm. H. Bixby,

Corps of Engineers, U. S. Army,

Chicago, Illinois.

Dear Sir:-

The overturned car ferry barge No.2 of the Lake Michigan Car Ferry Transportation Company was recently towed from behind the South Chicago breakwater to a point about three and one-half miles E. N. E., or thereabouts from the lighthouse on the said breakwater and an effort made to right said barge. The effort failed and the bow of said barge sank into about forty two feet of water. Efforts have been made to raise the vessel, but unsuccessfully. The undersigned desire to abandon the wreck to the United States Government hereby relinquishing all claims of any kind or nature whatsoever to any salvage connected with the disposition of said vessel.

Yours truly,

Lake Michigan Car Ferry Transportation Company,

United States Engineer Office,
508 Federal Building,
Chicago, Ill., July 6, 1907.

You are herewith notified that:

The Lake Michigan Car Ferry and Transportation Company's barge No. 2 has been abandoned by its owners as a wreck in Southern Lake Michigan at a point about three miles East North East ¼ East from the Calumet Harbor breakwater light, or about four miles E.N.E. ¼E. from the end of the piers of Calumet River entrance, being close to the course of vessels from Chicago Harbor to Indiana Harbor, Ind.

At present the rudder and about 35 feet length of the keel of boatshows about 4 feet above the water surface.

The wreck will be lighted until it can be destroyed or otherwise removed.

white lights on posts nailed to strong boat 10 ft above water

Very respectfully,

Wm. H. Bixby

Lt.Col.,Corps of Engineers,U.S.Army.

To- Tribune, Record Herald, Inter Ocean: This nptice is sent you as information. It can not be paid for as an advertisement.

To- Hydrographic Office,Chicago; Lake Survey Office,Detroit; Light-House Inspector, Chicago: As this wreck is liable to break up in a heavy storm, it would be very desirable to have its location marked by a gas bouy if your office can do so.

Chi.H. 2[illegible]/3

Chi. H. 229

July 9, 1907.

Brig. Gen. A. Mackenzie,
Chief of Engineers, U. S. Army,
Washington, D. C.

General:

1. I have just been notified by the Lake Michigan Car Ferry Transportation Co. that they have abandoned as a wreck their Barge No. 2 at present half sunk in Lake Michigan at a point about 3 miles ENE ½ E from the Calumet Harbor breakwater light in about 42 feet depth of water. The wreck lies close to the course (fortunately not much used) of vessels from Chicago Harbor, Ill., to Indiana Harbor, Indiana, and at a point where it might be easily run into by small sailing craft and small boats in fog or bad weather.

2. This barge No. 2, official number 67314, is a wooden boat of 1548 gross tonnage, 1462 net tonnage, 309 feet long, 42' beam, 7' draft when empty, with 12' depth of hold, and its forward deck and pilot house would ordinarily rise about 16 to 20 feet above water. It was built in 1895 to carry 30 loaded freight cars and has about 2400 feet of iron rail built into its deck, and carries a towing machine and steam capstan and windlass (worth perhaps $6300). In its present condition the boat is upsidedown with its pilot house buried in the lake bottom, and its rudder and perhaps 35' length of keel rise so as to show about 4' above water in quiet weather. It is possible that perhaps 3 to 6 cars of lumber are still inside the boat. It would be an exceedingly bad wreck for any vessel to run into at night or in a fog.

3. Owing to the fact that at this time of the year the southern end of Lake Michigan is navigated quite extensively by excursion boats with large parties on board it is considered that this wreck might be properly and most advantageously be removed under Section 20, act of March 3, 1899, the emergency appearing to justify immediate action and an award of proposals under only 1 or 2 days' notice. At the same time, as the owner has abandoned the wreck, it might be removed equally well under Section 19, except that a 10 days' delay for securing sealed proposals appears dangerous to navigation and therefore unjustifiable if reasonable bids can be received within a less interval of time. The method of removal which appears to me more desirable in this particular case and most advantageous to navigation is to secure bids under 1 or 2 days' notice under the proviso that the cargo and salvage shall become the property of the contractor.

4. The cost of the removal of the wreck is problematical. If it can be dislodged from the bottom and overturned it can be removed in a few days at little cost or perhaps profit to the United States;

Chi. H 229/6

but if it must be broken up and sunk beyond reach of vessels in heavy seas its cost might perhaps reach $15,000.00. The cost cannot be named to the Department until after bids have been received.

5. I am preparing to solicit proposals for the removal of this wreck giving only 2 days' notice and telling the bidders that the cargo and salvage will become the property of the contractor and the contract will be awarded to the bidder making the proposition most advantageous to the United States, assuming that this is allowable under Section 20, act of March 3, 1899. If it be not allowable I desire to be notified as to what change must be made. When bids are received I will make telegraphic request for allotment of funds.

Very respectfully,

WHB-GWS.

W. H. Bixby

Lieut. Col., Corps of Engineers.

Seen.GAML.

229/6

United States Engineer Office,
508 Federal Building,
Chicago, Ill., July 10, 1907.

Sealed proposals will be received at this office notlater than 10 A.M., July 13, 1907, for the removal of sunken barge No.2 of the Lake Michigan Car Ferry Transportation Company. Information furnished on application.

W. H. Bixby,
Lieut. Col., Corps of Engineers.

---o---

The Lake Michigan Car Ferry Transportation Co. have abandoned as a wreck their Barge No. 2 at present half sunk in Lake Michigan at a point about 3 miles ENE ½ E from the Calumet Harbor breakwater light in about 42 feet depth of water.

This barge No.2, official number 67314, is a wooden boat of 1548 gross tonnage, 1462 net tonnage, 309 feet long, 42' beam, 7' draft when empty, with 12' depth of hold, and its forward deck and pilot house would ordinarily rise about 16 to 20 feet above water. It was built in 1895 to carry 30 loaded freight cars and has about 2400 feet of iron rail buit into its deck, and carries a towing machine and steam capstan and windlass (worth perhaps $6300). In its present condition the boat is upsidedown with its pilot house buried in the lake bottom; and its rudder and perhaps 35' length of keel rise so as to show about 4' above water in quiet weather. It is possible that perhaps 3 to 6 cars of lumber are still inside the boat.

Bids are asked for the removal of this wreck so that it shall no longer be a danger to navigation. If raised and floated away all parts of the vessel may become the property of the contractor; in which case it must be so placed that it will never again interfere with navigation. If destroyed by explosives and sunk there must be left 35 feet clear depth of water over the highest part of whatever wreckage may remain on the Lake bottom, and all floating wreckage must be carried away and placed above water level in some place satisfactory to the U.S.Engineer Officer in charge. The contractor must commence work immediately after award of bid, must provide transportation and subsistence for 1 Government inspector, must properly light or mark the wreck both night and day until it is completely removed, must be responsible for any damage during the progress of the work occurring either to his plant or employees or passing vessels, and must remove any obstructions which he may place in the Lake during progress of his work.

Payment will be made after all his work has been done.

All cost of the above must be provided by the contractor and included in the single price named in his bid. The bidder should name a price for the entire work and the number of days within which he will guarantee the removal of the wreck. Should the wreck not be removed within the time limit named in the bid the U.S. shall have the right to take possession of whatever remains without any payment whatever to the contractor, or to hold him to its complete removal.

If the cost of the work exceeds $5,000 the contractor will be required to enter into contract and furnish bond, such as usually required for War Department work.

---o---

Seen.GAML.

Subject to the conditions named above I herewith propose for the sum of _____ Dollars to remove the wreck of Barge No.2, as above described, and to do the work in _____ days after acceptance of bid.

My method of work will be

For specifications - see July 10 Letter Sent Penn Bush and

UNITED STATES ENGINEER OFFICE,
508 Federal Building,
Chicago, Ill., July 10, 1907.

-: N O T I C E :-

Dear Sir:

Referring to the blank proposal sent you by another envelope today for the removal of Barge No. 2 outside of Calumet Harbor, I have further to state that if you consider the salvage to be worth more than the cost of wreck removal (as might easily be the case if you are able to float the wreck and tow it away) your bid should be changed on the blank form so as to read "I will agree to remove the wreck within _____ days and will pay $_____ for the immediate possession of the same".

The responsibility of the contractor for lighting the wreck must commence with the day following his receipt of notice of award of bid.

Very respectfully,

WHB-GWS.

Lieut.Col.,Corps of Engineers.

Sent to:

Great Lakes Dredge & Dock Co., Chicago, Ill.,
Dunham Towing & Wrecking Co., Chicago, Ill.,
Staud y Ximenez, 106 Gaff Bldg., Chicago, Ill.,
John S. Quinn Wrecking Co., Detroit, Mich.,
Louis D. Hawley, Wrecker, Detroit, Mich.,
Capt. H. W. Baker, Wrecker, Detroit, Mich.

1—363.

Department of the Interior,

RETURNS OFFICE,

July 30 1907

SIR:

I have the honor to acknowledge the receipt of your letter of July 25, 1907, transmitting the following contracts for file in the Returns Office:

Lieut. Col. H. H. Bixby	with Great Lakes Dredge and Dock Co. July 20. 1907.

Very respectfully,

John H. Watson
Returns Clerk.

Chief of Engineers
War Department
City.

Seen. GAMB.

27267b3m1-07

U. S. Engr. Office, Chicago Rivers & Harbors,
Rec'd Chicago, Ill., AUG 2 - 1907
Office No. Chi. H 229/21

Chi. H. 229/24

September 18, 1907.

Brig. Gen. A. Mackenzie,
Chief of Engineers, U. S. Army,
Washington, D. C.

General:

1. I have herewith to report that under authority granted by the Department July 20, 1907 (E.D.64337), Barge No. 2 of the Lake Michigan Car Ferry Transportation Co., which had been sunk and abandoned in Lake Michigan at a point N. 74° 42' E., 3 miles out from breakwater light at entrance to Calumet Harbor, was destroyed and the debris removed to a depth of nowhere less than 36 feet below Chicago City Datum, in such way as to no longer interfere with navigation.

2. A representative of this office inspected the removal and final disposition of the wreck.

3. The sum of $12,500 was allotted for this work on July 19 from the indefinite appropriation for removing sunken vessels, etc.

4. By August 31 the wreck was sufficiently cleared so that boats could safely pass, the work having been practically completed, but the contractor inadvertently removed the piles marking the wreck. The wreck was relocated on Sept. 13 when soundings were taken with the result mentioned above.

5. The work was done by Great Lakes Dredge & Dock Company under its contract dated July 20, 1907 (E.D.64337/3), for the sum of $12,000. The balance, after payment of a few items of contingencies, superintendence, etc., will be returned to the Treasury.

Copy of this report has been sent to U.S.Lake Survey Office.
By direction and in absence of Lt.Col.W.H.Bixby:

Very respectfully,

A. K. Shepard

Chief Clerk.

--GWS.

Seen. GAML.

not so described —
Completion of work not yet satisfactorily proved to WHB
" " accepted by WHB
Final report should await WHB's approval
But this will be allowed to stand for present awaiting further verifications
WHB

Chi. H 229/24

SUBJECT: CAL. HARP Removal of Car Ferry No. 2.

United States Engineer Office,

508 Federal Building.

CHICAGO, ILL., September 18, 1907.

Lieut. Colonel W. H. Bixby,
Corps of Engineers, U.S.Army,
Chicago, Ill.

Colonel:

I have the honor to report that the Lake Michigan Car Ferry Transportation Company's Barge No. 2, which had been aground in the Lake, 3.007 Miles, North 74° 42' East , from the U.S.Light House at the South-easterly end of the Breakwater in Calumet Harbor, Ill., was destroyed between the 24th of July and the 31st of August, 1907, and the debris removed to a depth of nowhere less than 36 feet below Chicago City Datum; all in accordance with the terms of a contract between this office and the Great Lakes Dredge and Dock Company, dated July 20, 1907.

Owing to the exposed position, at a considerable distance from the shore, much time was lost on account of too strong winds for this work, and only nine (9) days were devoted to actual operations.

In the excecution of the work, the following labor and plant were employed, to wit:

LABOR:	Superintendent,	5 days.
	Foreman,	9 "
	Captain of Tug,	9 "
	Engineers (on Tug & Pile driver)	13 "
	Firemen, (" " " " ")	13 "
	Diver, with outfit,	8 "
	Diver's attendant,	8 "
	Leaderman,	2 "
	Wenchman,	8 "
	Loftsman,	1 "
	Axman,	1 "
	Deckhands,	15 "
	Laborers,	12 "
PLANT:	Tug,	9 days.
	Diver's Scow,	8 "
	Pile driver,	2 "
	Flat Scow,	1 "
	Gasoline Launch,	1 "

The first part of the work done to accomplish the removal of the wreck was the driving of 3 61-foot piles to mark the place. These piles were removed, contrary to instructions, by the Contractors' South Chicago Representative, in the absense of the Inspector. The place was however found again, on the 13th inst., and re-marked, after

which the location was determined with a transit and the depth over the wreck tested with a sweep, showing that not less than 36 feet existed over any part of it. The sweep was set at a depth of 37 feet below the water level at the time, which stood one (1) foot above Chicago City Datum. The depth to the lake bottom around the wreck was found to be from 47 to 48 feet.

After the abandonement of the wreck by its owners, on July 9th, it was lighted by this office. For this purpose a lantern was borrowed from the U.S.Light House Inspector, to be returned to him when not further required. In the severe storm of July 25, the lantern was however destroyed, only the frame of it remaining. This has been placed in Calumet Harbor boat house as evidence.

I am, Colonel,

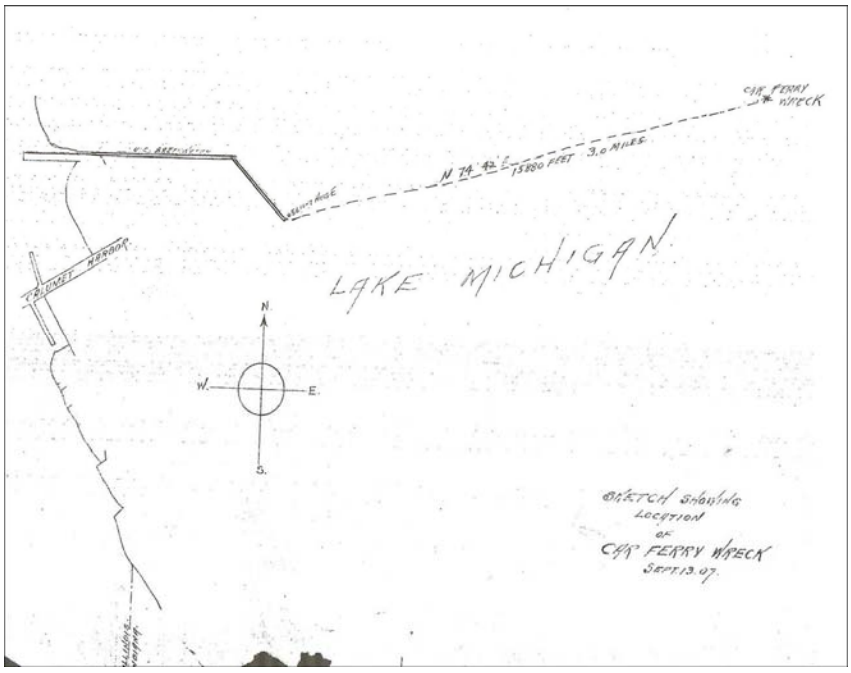
Very Respectfully,

GL-GL

Your Obeient Servant,

Assistant Engineer.

A sketch showing the location of the wreck is respectfully submitted herewith.



Sept. 15, 1908.

The Chief of Engineers,
United States Army,
Washington, D.C.

S i r :

1. I have to report that the U. S. Lake Survey Office by recent letter states:- that its Steamer Search has discovered a wreck in Lake Michigan off Calumet Harbor at a point 3-1/8 miles N. 73° 45' E. (azimuth 73° 45') from Calumet Harbor Lighthouse; and that such wreck, while lying in 45 ft. depth of water, has at the present high stage of Lake Michigan only about 22 feet of water over the wreck.

2. The wreck is claimed by some parties to be the remains of the hull of a car ferry barge sunk in July, 1907; but the identity of the wreck can not be vouched for at present. The cost of its removal is difficult to estimate until after an examination by a diver.

3. The wreck has been temporarily marked with a spar buoy; but as it is directly in the track of heavy excursion traffic to and from Chicago, it is still a dangerous menace to navigation and should be removed.

4. I have therefore to request herewith authority for a preliminary allotment of $100.00 from the indefinite appropriation for

Chi. H 229/35

removing sunken vessels or craft obstructing or endangering navigation, to cover an examination of this particular wreck and to commence work upon its removal, or else authority to pay for such work out of existing allotments for other wrecks.

5. If the foregoing is approved it is proposed to employ a diver to make a thorough examination and prepare an estimate of cost for the removal of the wreck down to about 24 feet below standard low water as given on U. S. Lake Survey charts and to commence work of removal; any further necessary funds to be secured by an additional allotment after the cost of the work has been definitely ascertained.

Very respectfully,

WHB-FRM

W. H. C. Bixby

Colonel, Corps of Engineers.

227/35

SUBJECT:

Chi.H.229.

United States Engineer Office,

508 Federal Building.

CHICAGO, ILL., September 25, 1908.

The Great Lakes Dredge & Dock Company,
1316 Chamber of Commerce Building,
Chicago, Illinois.

Gentlemen:

I have to inform you that the wreck reported by the U.S. Lake Survey steamer "Search" as being the Car Ferry Company's barge No. 2, in Lake Michigan, has been examined by Captain Theodore McMahon, government diver and wrecker, and pronounced by him, after verification of description in the office of the Car Ferry Company, to be the wreck of said Car Ferry.

Colonel Bixby directs me to require of you a written reply as to:

1st. If you will accept the above statement relative to the identity of the Car Ferry, or if you prefer to have your own diver make an examination of the wreck and report results to you.

2nd. If satisfied that the wreck is the Car Ferry you are at liberty to take action (in accordance with your letter of the 11th instant) either by removing the high parts of the wreck (with less than 24 feet of water below City Datum over it) or to pay actual cost of removing it by Captain McMahon. In this connection I would say that "actual cost" will not include loss of time on account of unfavorable weather.

Very respectfully yours,

GL-FEM

Chi. H 229/31

U.S.Assistant Engineer.

October 31, 1908.

Great Lakes Dredge & Dock Co.,

Chamber of Commerce,

Chicago, Ill.

Gentlemen:

Referring to your letter of September 26 to Assistant Engineer Liljencrantz, in which you express your willingness to settle any expense connected with the removal or destruction of the remains of the wreck of Car Ferry Barge No.2, I have now to advise you that this office has completed the removal of the said wreck, and to request that you pay the following expenses connected therewith:

Theo. McMahan, Diver with outfit, 5 days @ $7.00.....	$35.00
Oscar L. Anderson, Diver's Tender, 5 days @ $3.00.....	15.00
Carl F. Rasmussen, Inspector, 5 days @ $3.00.....	15.00
Artwick Dahl, for hire of Tug "R.P.Easton" and crew, 5 days @ $23.50.....	117.50
E.I. Du Pont de Nemours Powder Co., for dynamite.....	180.00
Total:	$362.50

Bills for tug hire and dynamite are inclosed. Please make your checks payable to the above named parties individually, and send same to this office.

Very respectfully,

Major, Corps of Engineers.

JZ

2 inclosures.

Chi H 229 J1