



## Memo

Date: Friday, April 13, 2018

Project: HDR #10090907

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From: Capt. Jeff Monroe/Bryan Jones

Subject: Pier 7 Study, Fort Trumbull State Park

### GENERAL INFORMATION

HDR was asked to undertake an evaluation of the Pier 7 facility at Fort Trumbull State Park in New London for continued use by US Navy and US Coast Guard vessels. In addition, HDR was asked to evaluate the facility's capabilities for potential use by cruise ships of various sizes. HDR was asked to analyze the following:

1. Baseline infrastructure improvements required to continue calls from USCGC Training Ship *Eagle*
2. Assessment of whether the infrastructure improvements required from 1 above, will meet the minimum requirements for accommodating cruise ship calls (and if so, what size vessels) including the handling of shore excursions and related tourism activities.
3. If Section 1 improvements will not accommodate cruise ships, an assessment of the **minimum** additional infrastructure improvements required (with a note that there is a historic aesthetic that must be maintained and there is no desire to construct a cruise terminal).
4. Additional optional infrastructure that could be added to further accommodate cruise ships

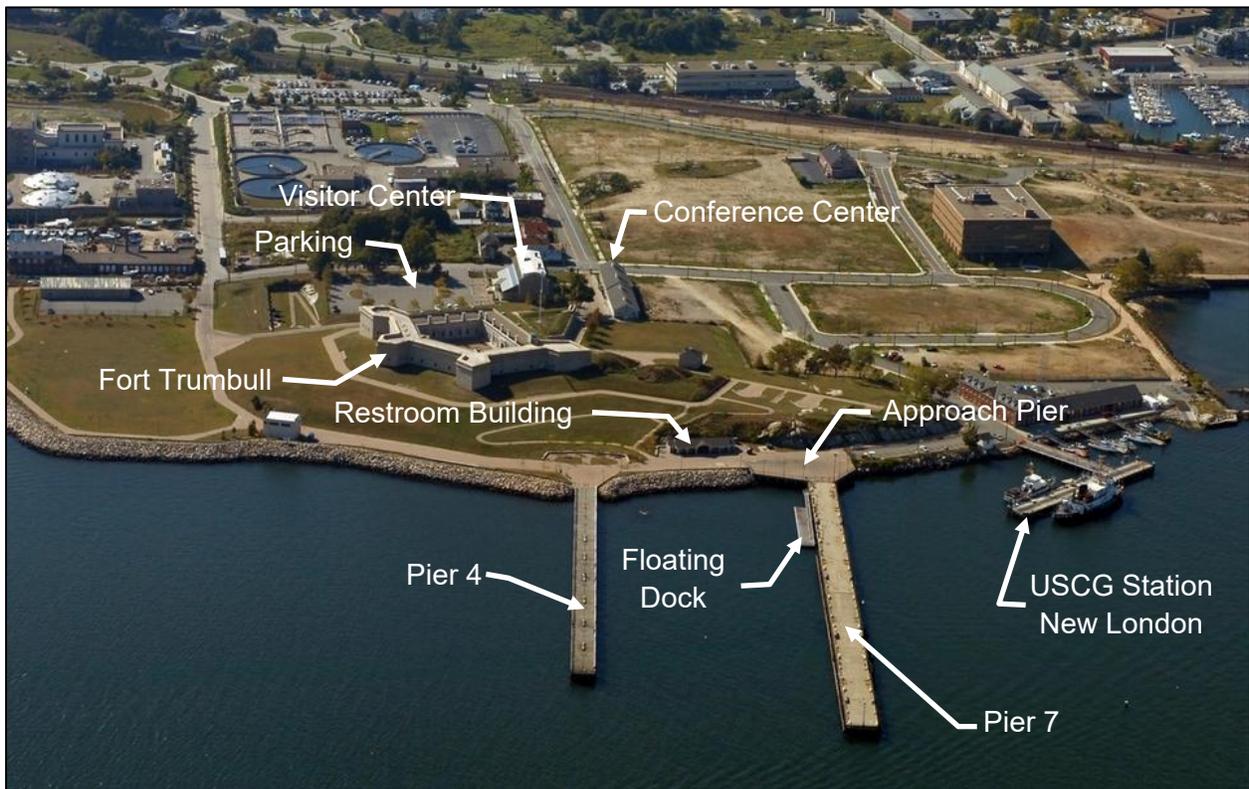
The pier is located off of the historic Fort Trumbull State Park, and was a former military pier used for various purposes, including vessel servicing. The site is adjacent to USCG Base New London and can be accessed by the public to tour the historic site, walk the waterfront grounds and enjoy public events such as concerts or festivals.

The pier is in deep water located near the mouth of the harbor and has hosted the USCG Training Ship *Eagle* as well as other vessels, including those which have participated in various tall ship events. Unfortunately, a 2017 condition survey performed for the US Coast Guard identified deficiencies in the pier's current infrastructure, which prevent the *Eagle* from being homeported at Pier 7 after the 2018 season due to safety concerns. There are a number of improvements that are required to ensure continued use by USCG and Navy vessels including structural repairs and upgrades to the fender system, and pier utilities (i.e. water/sewer and electrical systems). Pier lighting also needs to be enhanced.

The preliminary findings are that the site is well suited for all of these vessels, including cruise ships of a limited size. Significant structural repairs, however, as well as upgrades to the fendering and pier utilities will need to be made to both maximize the remaining service life of the pier structures and provide improvements to adequately service the modern requirements of USCG, Navy and other visiting vessels.

### FORT TRUMBULL STATE PARK

The Fort Trumbull State Park and Historic Site is located on the west side of the Thames River waterway near the mouth of New London Harbor. Originally constructed in 1777, the park and fort complex is a popular tourist attraction and is listed on the National Register of Historic Places. The 14-acre site was originally opened as a state park in 2000. In addition to the historic fort, the State Park complex includes a 1,600-foot-long waterfront walk, a Visitor Center with a museum and gift shop, a Conference Center, a Fishing Pier (Pier 4), restroom facilities, an Approach Pier, and Pier 7. The State Park is open year-round and has on-site and on-street parking. Figure 1 provides an aerial view of the park and its waterfront facilities.



**Figure 1:** Fort Trumbull State Park

Figures 2 through 5 provide general views of the existing waterfront infrastructure at Fort Trumbull State Park.



**Figure 2:** Walkways and riprap shoreline.



**Figure 3:** Public Restroom Building.



**Figure 4:** Pier 4, public fishing pier.



**Figure 5:** Pier 7, with floating dock and gangway ramp.



**Figure 6:** Fort Trumbull Visitor & Conference Center.

The Fort Trumbull State Park is a key historic asset of the State of Connecticut. Visited by thousands annually, all marine operations with vessel calls should be managed, so as to cause little or no disruption to the normal course of activities on site, including regular visitors to the historic fort, use of the park area, area traffic flows, and visitor and conference center access. Highest priority should be given to the management and mitigation of any potential impacts from people on site as a result of marine vessel calls, including security and other federal requirements, to ensure the protection of the park property and

its historic buildings. The bringing of additional visitors to the site by ship potentially opens the park to a much wider range of public exposure, minimizes personal car traffic and generates additional revenue for the facility. Marine activities have been successfully integrated into similar facilities and Fort Trumbull is ideally suited for the proper size vessel with proper and coordinated management to the benefit of the park and the community.

## WATERFRONT FACILITIES

### APPROACH PIER

The Approach Pier provides access to Pier 7 from the paved waterfront walk along the shoreline. The Approach Pier consists of a concrete deck supported by approximately 57 steel piles. As shown in Figure 7, the steel piles are encased in concrete from the bottom of the deck to approximately 3.5 feet below the mean low water line.

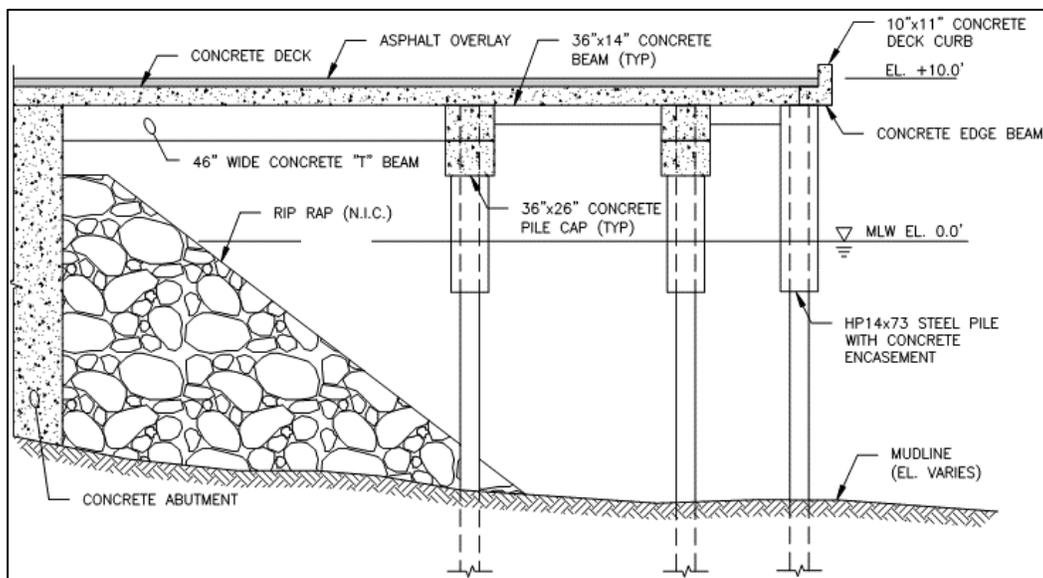


Figure 7: Section view of the Approach Pier structure.<sup>1</sup>

### PIER 7

Pier 7 has most recently been used by the US Coast Guard for the homeport of the USCGC *Eagle*, and has also seen use by the US Navy for visiting destroyers in the recent past. A condition survey conducted for the Coast Guard's Civil Engineering Unit Providence in 2017, however, found a number of structural and functional deficiencies that need to be addressed in the near term to allow the continued use of the pier for USCG and US Navy vessels.

The berth on the north side of Pier 7 is approximately 40 feet in depth and extends approximately three quarters of the length of the pier. The current berth could accommodate vessels under 700 feet in length with a draft of less than 37 feet. The pier width is adequate for passenger handling equipment such as gangways to and from the vessel. As shown in Figure 8, the waterway from the channel to the berth is deep enough to allow vessels to make an effective approach to the pier, particularly on the north side

<sup>1</sup> Childs Engineering Corp., *USCGC Eagle Homeport Pier Evaluation*, Dept. of Homeland Security, US Coast Guard Civil Engineering Unit Providence, August 2017.

which is the preferred berth for any larger vessels. Departing vessels also have sufficient space to turn into the channel when undocking. The south side berth can also be used for smaller vessels such as the *Eagle* and for appropriate length military vessels, such as the USS *Truxtun* (shown in Figure 9) or smaller commercial or public vessels.

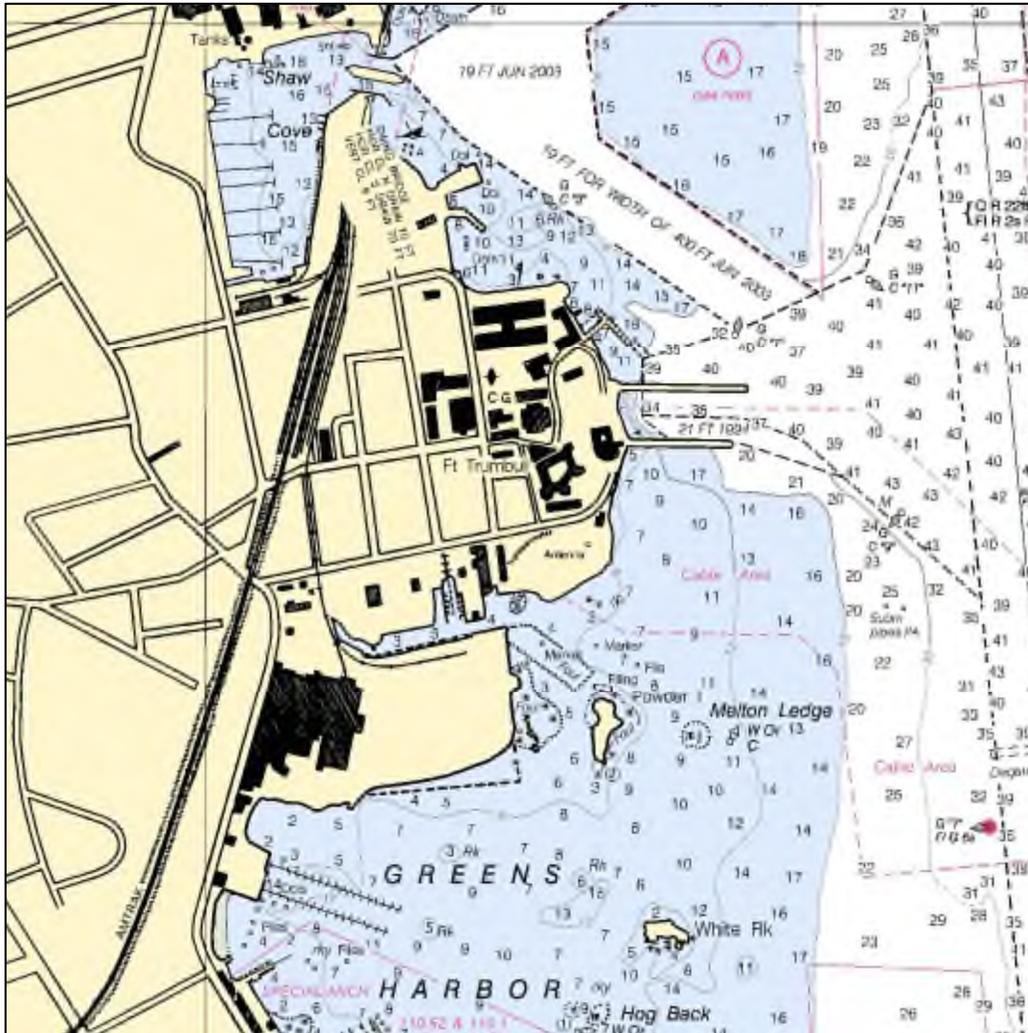
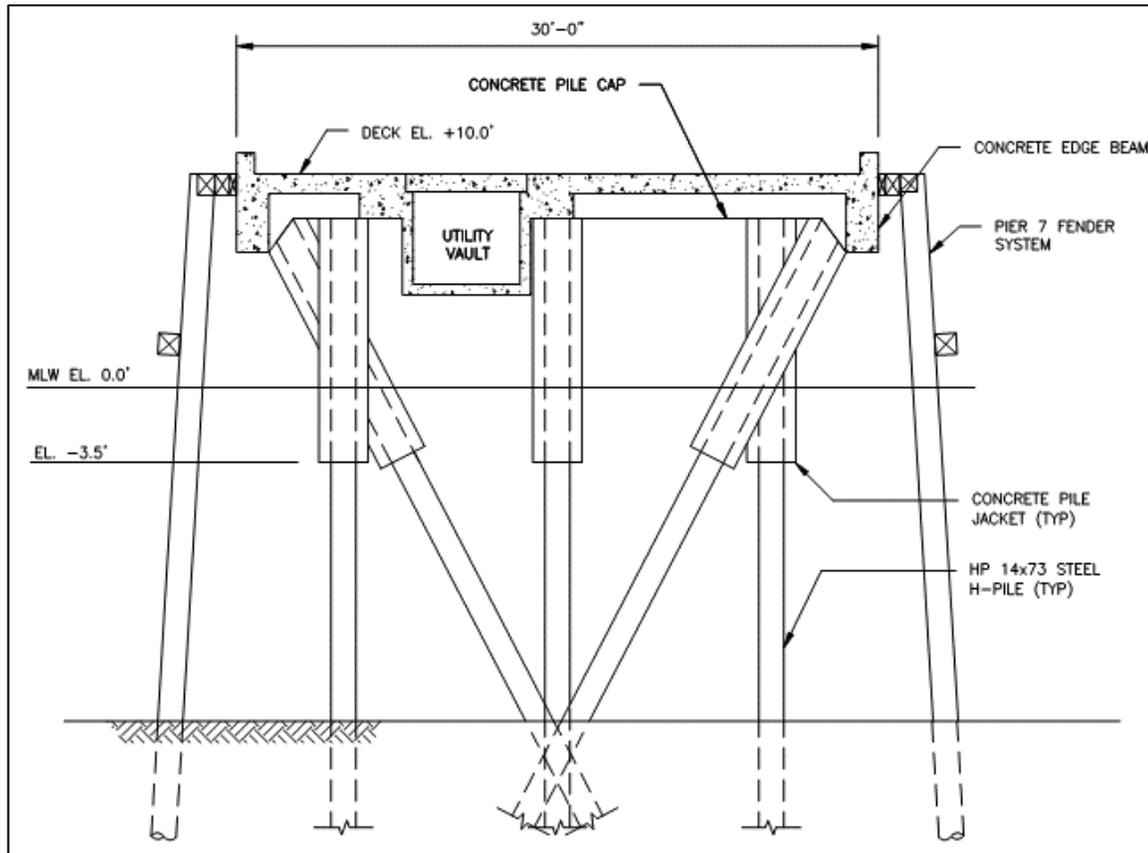


Figure 8: Approaches to the piers at Fort Trumbull



Figure 9: USCGC Eagle and USS Truxtun berthed at Pier 7.

Pier 7 was originally constructed in 1965 by the US Navy, and measures 657 feet long and 30 feet wide. The deck is 11-inch thick concrete, and consists of a concrete deck supported by 52 bents of steel piles (HP 14x73 section) encased in 12-foot long concrete jackets from the pile caps down into the water; similar to the piles on the Approach Pier (see Figure 10).<sup>2</sup> A timber fender system is provided on both sides of the pier.



**Figure 10:** Section view of the Pier 7 substructure.<sup>3</sup>

A floating dock is located on the south inshore face of the pier. The floating dock measures approximately 16 feet wide by 115 feet long. A platform and gangway are provided on the floating dock to give personnel access from the waterline to the top of the fixed pier deck.

Pier 7 and the Approach Pier structures were last inspected above and below water in 2017 by Childs Engineering Corporation. The inspection report prepared by Childs at that time included a structural load rating and berthing analysis to assess the basic facility requirements for continued use of the pier to homeport the USCGC *Eagle*.

The structural analysis of the pier deck by Childs was based on the observed conditions. The analysis made certain assumptions about the structure, as the as-built plans with details on the reinforcing steel were not available. The structural analysis indicated that the pier deck has an allowable uniform live load

<sup>2</sup> Childs Engineering Corp., *USCGC Eagle Homeport Pier Evaluation*, Dept. of Homeland Security, US Coast Guard Civil Engineering Unit Providence, August 2017.

<sup>3</sup> *Ibid.*

capacity of 311 pounds per square foot. This capacity will generally accommodate wheel loads from forklifts, HS-20 trucks, and a 40-ton truck mounted crane.

The 2017 report also provided a mooring and berthing analysis for the USCGC *Eagle* at Pier 7. The pier is outfitted with 30-ton cleats and double bitt bollards for mooring hardware.

The results of the structural and mooring analysis indicated that the pier meets the basic facility requirements to support berthing of the USCGC *Eagle* at Pier 7. There are substantial structural defects throughout the pier, however, which need to be addressed within the next several years to prevent further reduction in the current capacity beyond a level required to safely berth the USCGC *Eagle* and Navy vessels. The report recommended improvements in four key areas of infrastructure including the pier structure, vessel berthing, mechanical utilities, and electrical utilities.

#### **Structural Repairs**

In addition to miscellaneous concrete repairs to the deck and pile caps, it was recommended that the concrete pile jackets on all of the piles supporting the pier be extended all the way to the mudline. This is required to repair the existing deterioration of the steel piles due to corrosion, as well as to preserve and extend the service life of the pier.

#### **Berthing Improvements**

The recommended berthing improvements included additional sections of timber fendering, in addition to three pneumatic fender units (i.e. sea cushions) to better spread the lateral vessel loads along the pier and across the mooring hardware.

#### **Mechanical Utility Upgrades**

There are currently no working mechanical utilities on the pier. The Childs report recommended adding water (potable and fire protection) and sewer piping along the pier to service the USCGC *Eagle* and other visiting Navy vessels. All piping would also need to be heat traced to prevent freezing in winter conditions.

#### **Electrical Utility Upgrades**

There is some electrical and telecommunications service already on the pier, including pier lighting and a 500 amp, 1-gang shore power unit used for the USCGC *Eagle*. The existing electrical utilities also include telephone lines and a CGDN LAN cable connection.

The Childs report estimated that the total cost of the required structural repairs, fender repairs, and mechanical/electrical utility upgrades is approximately \$8.6 million. This would be the required investment to extend the anticipated service life of the existing pier another 25 years, with regular maintenance.

### **VESSELS APPROPRIATE TO FORT TRUMBULL'S IMPROVED FACILITIES**

Assuming the waterfront structures at Fort Trumbull are repaired, improved, and maintained in a state of good repair. HDR has evaluated the suitability of the site for accommodating various ship calls, including appropriately sized military and cruise vessels

#### **MILITARY VESSELS**

Military ships and other public vessels can be accommodated at the pier, assuming the vessels do not exceed the length of the pier structure. Longer ships may be possible if an additional mooring dolphin(s) or a pier extension is added to lengthen the berth. Use of the pier is most appropriate for smaller military vessels such as frigates, destroyers, patrol craft, cutters, tenders, research vessels and training vessels.



For example, the USS *Truxtun* was accommodated at the pier and is 510 feet in length, 66 feet beam and 9,200 tons displacement. Due to extended stays, the vessels may require electrical service, fresh water, sewage and slops removal, trash and specialized security. Vessel arrangements are generally made directly by the Navy, Coast Guard or the vessels' sponsoring institutions.

## CRUISE SHIPS

The Fort Trumbull State Park site could be particularly well suited to host a smaller class of cruise ships, with the addition of appropriate improvements to the site and the pier. HDR reviewed all of the cruise ships now currently in the New York, New England and Atlantic Canada cruise market. Based on the 2017 cruise ship schedules of Portland and Bar Harbor, Maine; St. John, New Brunswick; New York City; Boston; and Halifax, Nova Scotia, the following vessels listed in Table 2 were identified as being compatible with the Pier 7 facility. All of these vessels are less than 700 feet long, with proportional drafts, and visited one or more of the ports in the region. In addition, a review of the operating companies was undertaken to identify those companies that operate vessels that would be appropriate for the existing/modified facilities based on length overall and operating draft.

**Table 2:** Ships in the 2017 New England-Atlantic Canada cruise market that could be received at Pier 7 (based on length and draft)

List of Ships	Cruise Line	Length (ft)	Beam (ft)	Draft (ft)	Passenger Capacity
<i>Silver Muse</i>	Silversea Cruises	698.0	86.0	22.0	596
<i>Mein Schiff 6</i>	TUI Cruises	696.0	139.0	27.0	2,534
<i>Ocean Dream</i>	Pullmantur Cruises	671.0	86.0	23.0	1,422
<i>AIDAvida</i>	AIDA Cruises	665.5	116.5	20.7	1,266
<i>Saga Sapphire</i>	Saga Cruises II	655.0	93.7	27.2	1,158
<i>Seabourn Quest</i>	Seabourn Cruise Line	650.0	84.0	21.0	450
<i>The World</i>	ROW Management	644.0	97.0	22.0	200
<i>Amadea</i>	Phoenix Reisen	632.0	81.0	20.3	624
<i>Silver Whisper</i>	Silversea Cruises	610.0	81.8	19.6	382
<i>Pacific Princess</i>	Princess Cruises	593.0	86.6	19.0	826
<i>Insignia</i>	Oceania Cruises	592.0	84.4	19.5	1,224
<i>MS Insignia</i>	Oceania Cruises	592.0	84.0	19.5	824
<i>Insignia</i>	Oceania Cruises	592.0	84.4	19.5	1,224
<i>Marco Polo</i>	Cruise & Maritime Voyages	578.4	77.3	26.9	650
<i>Seven Seas Navigator</i>	Regent Seven Seas Cruises	560.0	81.0	24.0	490
<i>MS Hamburg</i>	Plantours Kreuzfahrten	472.0	70.6	16.9	420
<i>Lo Soleal</i>	Compagnie du Ponant	466.0	59.0	16.0	264
<i>Silver Explorer</i>	Silversea Cruises	354.0	51.0	14.0	132
<i>Pearl Mist</i>	Pearl Seas Cruises	325.0	55.0	12.0	210
<i>Victory 1</i>	Victory Cruise Lines	286.0	50.0	13.5	210
<i>American Constellation</i>	American Cruise Lines	269.0	56.0	12.0	175
<i>Independence</i>	American Cruise Lines	194.7	50.0	11.3	104

Figure 11 provides a view of the *Silver Muse*, which is the longest vessel listed above. A summary of various cruise lines for these vessels is presented in Table 3.



**Figure 11:** Silversea Cruise Lines' *Silver Muse*.

**Table 3:** Description of Cruise Lines operating the ships identified in Table 2.<sup>4</sup>

Cruise Line	Description
<b>AIDA Cruises</b>	AIDA Cruises is an American/British owned German cruise line based in Rostock, Germany. AIDA ships cater to the German-speaking market. AIDA Cruises is now one of ten brands owned by Carnival Corp, based at Miami, Florida, accounting for 6.5% of its share of revenue. AIDA offers cruises to North America, Northern Europe, Western Europe, Southeast Asia, Canary Islands, Mediterranean, Caribbean, Baltic Sea, Red Sea, Black Sea and Dubai cruises. It currently has 11 ships and by 2021 plans on having a fleet of 2014 vessels.
<b>American Cruise Lines (ACL)</b>	American Cruise Lines specializes in small ship cruising and is the largest cruise line in the US. ACL visits 25 states in the Pacific Northwest, Alaska, New England, the Southeast, and the Mississippi River regions. The Line has over 35 itineraries ranging from 5 to 22 days long, and has been consistently recognized for providing personalized service aboard the finest ships. ACL has a fleet of 10 small cruise ships including: coastal ships, modern riverboats, and authentic paddlewheelers. ACL has a focus of introducing only brand new ships. With two new vessels being introduced in 2018, the Line will continue to operate the largest modern fleet in the US.
<b>Compagnie du Ponant</b>	Compagnie du Ponant (CDP/Ponant) is a French cruise ship operator. It was founded in April 1988 and operates five ships, all of which operate under the French flag. CDP offers destinations to Northern Europe and Greenland, Scandinavia, Baltic and Iceland, Adriatic and Mediterranean: Corsica, Italy, Croatia, Aegean and Black Sea, Iberian Peninsula, Red Sea and Persian Gulf, Indian Ocean: Maldives, Asia, South and Central America, Antarctica, Canada/New England
<b>Cruise &amp; Maritime Voyages</b>	Cruise & Maritime Voyages (CMV) is a passenger shipping company headquartered in Essex, United Kingdom. The currently have a fleet of five vessels. They offer smaller sized cruise ships and are accessible have 11 UK departure locations.

<sup>4</sup> Info collected from corporate websites.

Cruise Line	Description
<b>Oceania Cruises</b>	Oceania Cruises is a Miami, Florida, based shipping company that operates six premium cruise ships on worldwide itineraries. Since September 2014, Oceania Cruises has been owned by Norwegian Cruise Line Holdings, LTD. which also owns Norwegian Cruise Line (NCL) and Regent Seven Seas Cruises. While it also offers cruises as short as ten days, the norm is 10- to 14-days and the line is also known for its long cruises lasting up to 180 days. Destinations include Africa, Arabia, Black Sea, Caribbean, Central America, China, Greek Isles, Iceland, India, Mediterranean, Alaska, Mexico, Russia, Scandinavia, South America, and Southeast Asia. They recently added Cuba to their itinerary.
<b>Pearl Seas Cruises</b>	Based out of Guildford, CT, Pearl Seas Cruises operates the 210 guest <i>Pearl Mist</i> which sails to destinations in the Canadian Maritimes, Northeast United States, St. Lawrence Seaway, Great Lakes, and Cuba.
<b>Phoenix Reisen</b>	Phoenix Reisen is a Germany-based travel agency that also operates a fleet of four cruise ships. In addition, it also has a fleet of around 50 river boats. The company features cruises in Europe's North Sea and Baltic Sea, Iceland and Greenland Cruises, Great Britain or the Baltic States and Scandinavia. In addition, they offer cruises to the Mediterranean Sea, Black Sea, Canary Islands, Cape Verde and the Atlantic Islands of the Azores, as well as South America and North America, Africa, the Orient with the Arabian Peninsula, Asia from India to Japan and Australia and New Zealand.
<b>Plantours Kreuzfahrten</b>	Based out of Bremen, Germany, Plantours Kreuzfahrten has seven cruise ships. In particular, the MS Hamburg sails from the London to the St. Lawrence River and down the coast to the Amazon.
<b>Princess Cruises</b>	Princess Cruises is a cruise line owned by Carnival Corporation. The company is incorporated in Bermuda and its headquarters are in Santa Clarita, CA. The line has 17 ships which cruise worldwide and are marketed to both American and international passengers and carries more than 1 million passengers a year.
<b>Pullmantur Cruises</b>	Pullmantur Cruises S.L. is a cruise line headquartered in Madrid, Spain. In 2006, Pullmantur Cruises, through its parent company, was purchased by US-based Royal Caribbean Cruises Ltd. who sold a 51% stake to the Spain-based Springwater Capital in 2016. Pullmantur Cruises is the largest Spain-based cruise line. The company markets mainly to Spanish passengers. Most Pullmantur ships do not operate cruises during the northern hemisphere winter season.
<b>Regent Seven Seas Cruises</b>	Regent Seven Seas Cruises is headquartered in Miami, FL. The company offers luxury cruises which visit over 300 ports worldwide. Regent Seven Seas specializes in ships with small passenger capacity and many included amenities. Apollo Management, an investment group, purchased Regent Seven Seas Cruises in February 2008. Apollo Investments also owns Oceania Cruises and 15.8% of Norwegian Cruise Line, as well as Regent Hotels & Resorts. The company currently has four ships in its fleet with plans to add another in 2020.
<b>ROW Management</b>	ROW Management operates The World, which is the world's largest private residential ship on the planet. The World is home to 165 Residences, and the ship sails around the globe.
<b>Saga Cruises II</b>	Saga is a British based cruise line to which cruises are aimed at people aged 50 and over. Saga is a British cruise company that sail the Baltics, Canary Islands, Caribbean, Mediterranean, Europe, Iceland, Norway, UK and Ireland. The company currently has two cruise ships, with plans to add a third in 2019.
<b>Seabourn Cruise Line</b>	Seabourn Cruise Line is an ultra-luxury cruise line headquartered in Seattle, Washington. The line operates all around the world, from short seven-day Caribbean cruises to 100+ day around the world cruises. It is owned by Carnival Corporation. The company's fleet currently consists of five vessels, with two sets of sister ships. The fifth, Seabourn Encore is due to be launched in 2018.
<b>Silversea Cruises</b>	Founded in 1994, Silversea Cruises is a privately owned luxury cruise line with its headquarters in Monaco. Silversea's co-founders, owners and operators are the Lefebvre family of Rome, Italy. As of early 2014, the company had eight boutique cruise ships, each of which carries only 100 to 540 passengers. In spring 2017, Silversea added the slightly larger (596 passenger) Silver Muse, for a total of nine all-suite ships.

## ADDITIONAL PIER CONSIDERATIONS

### MOORING DOLPHINS

To accommodate larger vessels, it may be possible to install an additional mooring dolphin 50 to 75 feet off the east end of Pier 7. This would allow for better mooring of larger vessels up to approximately 700 feet length overall (LOA). Extension of the berth in this manner would not constrain the navigational approach to the pier.

### FENDER SYSTEM

The condition of the existing timber fender system at Pier 7 was noted to be in poor condition based on the 2017 inspection.<sup>5</sup> The fender system would require an upgrade to support cruise vessels, however, a more cost effective and acceptable approach might be to provide floating timber or synthetic camels along the pier face. Pier camels keep the vessel off the pier, while distributing the forces from the vessel along the continuous fender system in a more even manner. The camels rise and fall with the tide; leaving no marks on the vessel's side. A typical pier camel is shown in Figure 12 for illustrative purposes.



**Figure 12:** A typical floating pier camel along a timber fender system.

### PASSENGER GANGWAYS

The existing 30-foot wide deck is wide enough and has sufficient capacity to support passenger handling equipment, such as the examples provided in Figure 13. The gangway and ramp requirements would need to be evaluated on a case-by-case basis for each vessel calling on the facility. Some vessels may possess gangways as part of the ship's gear, and others may require that the pier facility provide them.

<sup>5</sup> Childs Engineering Corp., *USCGC Eagle Homeport Pier Evaluation*, Dept. of Homeland Security, US Coast Guard Civil Engineering Unit Providence, August 2017.



**Figure 13:** Typical passenger gangways to support cruise vessel operations.

#### UTILITIES

The pier's existing electrical system includes deck lighting and a 500-amp, 480-volt, 60 hertz shore power service for the USCG *Eagle*. A telecommunications panel was also observed on the pier for *Eagle*. There did not appear to be any working fire protection or potable water service on the pier, although there is a utility vault down the length of the pier that could be used for installation of these services. There is a single sewer pipe hung under the pier with a through-deck connection, which is not heat traced. It would be desirable to re-establish potable water, fire water, and sewage services to support the *Eagle*, US Navy and potential cruise vessels at the pier.

#### MOORING AND BERTHING ANALYSIS

As-built plans of the pier structure were not available for HDR's review, so it is difficult to determine its design capacity relative to the potential mooring and berthing loads by cruise vessels that could physically fit at the pier (shown in Table 4). The 2017 USCGC *Eagle* Homeport Evaluation Report does provide some analysis that indicates the pier structure is adequate to support the *Eagle* in its current state of repair. The report does note, however, that maintenance repairs are recommended to preserve the pier's structural integrity, else continued degradation may reduce the pier capacity beyond acceptable levels within the next five years. The report identified more than \$8.5 million in structural repairs, fender repairs, and electrical and mechanical utility upgrades that would be needed to meet the basic facility requirements specified by the US Coast Guard for homeport of the *Eagle* at the pier.



For comparison with the potential cruise vessels listed in Table 4, the USCGC *Eagle* is 295 feet long, with a 39-foot beam, and a draft of 17.5 feet. The vessel displacement is 1,784 tons.

**Table 4:** Cruise Vessel Gross Tonnages

List of Ships	Cruise Line	Gross Tonnage
<i>Silver Muse</i>	Silversea Cruises	40,700
<i>Mein Schiff 6</i>	TUI Cruises	98,811
<i>Ocean Dream</i>	Pullmantur Cruises	35,265
<i>AIDAvida</i>	AIDA Cruises	69,203
<i>Saga Sapphire</i>	Saga Cruises II	37,049
<i>Seabourn Quest</i>	Seabourn Cruise Line	32,346
<i>The World</i>	ROW Management	43,524
<i>Amadea</i>	Phoenix Reisen	28,856
<i>Silver Whisper</i>	Silversea Cruises	28,258
<i>Pacific Princess</i>	Princess Cruises	30,277
<i>Insignia</i>	Oceania Cruises	30,277
<i>Marco Polo</i>	Cruise & Maritime Voyages	22,080
<i>Seven Seas Navigator</i>	Regent Seven Seas Cruises	28,803
<i>MS Hamburg</i>	Plantours Kreuzfahrten	15,067
<i>Lo Soleal</i>	Compagnie du Ponant	10,992
<i>Silver Explorer</i>	Silversea Cruises	6,130
<i>Pearl Mist</i>	Pearl Seas Cruises	5,109
<i>Victory I</i>	Victory Cruise Lines	4,954
<i>American Constellation</i>	American Cruise Lines	4,057
<i>Independence</i>	American Cruise Lines	3,000

## UPLAND SITE CONSIDERATIONS

Cruise ships offer the most complex challenges but also generate the most significant revenue for host facilities. Port of call vessels generally stay for periods less than 16 hours on average. The primary considerations when looking at the pier and site to accommodate cruise ship traffic on port of call visits are retaining the historic context of the site and making it convenient for ship passengers to access ground transportation for shore excursions.

## BUSES AND SHUTTLES FOR EXCURSIONS

About 80% of passengers spend at least 4 hours ashore during port calls.<sup>6</sup> Only two percent (2%) of ship passengers remain aboard vessels during port calls; generally because of physical mobility or lack of interest in the shore based activities. If approximately 50% of passengers take shore excursions, for the largest ship capable of calling on Pier 7 (2,000-2,500 passengers), that would be approximately 1,000 to 1,250 persons ashore. If everyone embarked on all day excursions, that would require between 22 and 25 bus moves at the beginning and end of the day (assuming a 50-person bus). In most cases,

<sup>6</sup> Bar Harbor Cruise Impact Report 2016.

excursions are limited to four hours, allowing passengers to return to the vessel for lunch. That would require 11-12 bus moves 4 times daily.

#### PIER SECURITY

The cycle of passenger flow is dependent upon the layout of the infrastructure. Passengers leaving the ship must be able to safely transit the pier apron, which is a security controlled area under 33 CFR Part 105 Federal Security Regulations. The entrance and exit of the pier is access controlled, generally with a gate, gatehouse and an appropriate number of security personnel. Normally, a fixed security gatehouse is placed at the head of the pier with passenger lanes for passengers coming ashore and entrance lane for ship issued ID checks allowing access to the pier. The gatehouse may also be equipped with camera monitors to address security requirements. Pier lighting and cameras can also be controlled from the gatehouse. Security cameras can also be tied to the nearby USCG Station and to the Fort Trumbull Conference Center which can serve as an alternate Emergency Response Center.



**Figure 14:** Existing restroom facilities and security gate at the head of Pier 7.

#### SIGNAGE AND WAYFINDING

Leaving the site, signage directs passengers to either a bus and ground transportation area or to walkways leading to town or the Fort Trumbull Historic Site and Visitors Center. Bathroom locations are carefully marked and available for higher volumes of passengers, generally when they are returning. The pier has restroom facilities near the head of the pier, which can be used mostly by returning passengers. This building should be upgraded as appropriate.

#### GROUND TRANSPORTATION AREAS

The ground transportation area for taxis, private vehicle pick-up and staging of shore excursion or shuttle buses should be as short of a distance from the pier head as possible. This allows the easiest movement of passengers by foot from the pier area in anticipation of physical limitations. Upon return, the passengers pass through the security gates by presentation of a ship issued ID card and then are screened before being allowed aboard by the vessel themselves. Some cruise lines prefer to screen passengers upon entering the pier area in coordination with the port. This is generally determined in the preparation of the security plan which should be crafted in such a manner as to limit port liability for security compliance.

There are existing areas on both the north and south sides of the fort complex which would be appropriate for ground transportation areas serving Pier 7. In addition to bus staging, there needs to be unencumbered and direct roadway access to and from the staging area. Roadways on the south side of the fort area are constrained and have tight corner turns. There is also a large amount of street parking.

In addition, this is the main access route for visitors coming to the fort and entering the parking area and going to the Visitor's Center.

The north side has several open areas for parking, transportation services and roadway circulation. There is also unencumbered access to connecting roadways to downtown. The roadways are wide and street parking not evident. There is also a circular roadway pattern which can accommodate traffic in an orderly manner.

The ground transportation area would ideally be paved and have angled bus parking stalls (12 feet wide) referred to as "docks". There would be an 8 foot separation between bus docks to allow passenger loading and unloading. Each dock would be numbered and four designations placed on a sign board as passengers enter the bus dock area.

Both the north and south side of the site have direct access to and from the pier via paved walkways. The north side has a shorter walking route to the potential ground transportation area. The pavement condition along the walkways are worn and irregular and should be improved. In addition, a number of benches for seating can be added in walking areas to accommodate passengers walking to and from buses or headed for downtown by foot.

To accommodate cruise passengers who intend to travel beyond the State Park, shuttle buses to local tourism venues would have to be arranged. These are generally smaller buses handling approximately 20 passengers each. They would provide service to local destinations such as downtown New London, the USS *Nautilus* Museum, US Coast Guard Academy Museum and could include other historic venues such as the Monte Cristo Cottage, Shaw Mansion, New London Customhouse, Nathan Hale Schoolhouse or the Lyman Allyn Art Museum. Local historic tour cycles can include multiple stops in a 3-hour cycle, or have routes with stops to include each venue within hourly cycles.

In addition, shore excursions using 40-50 person buses will need to be accommodated on 3- or 4-hour cycles twice per day (morning and afternoon). This excursions would reach tourist areas such as Mystic Seaport, Mystic Aquarium, Mashantucket Pequot Museum & Research Center, or other numerous historic and interesting sites within 45 to 60 minutes near the Fort Trumbull State Park.

To meet the needs of the shore excursion traffic, a ground transportation area would have to be established. In addition, parking for personnel who provide services for the vessel while in port would have to be accommodated. This includes security guards, deliveries, ship agents, shore excursion management personnel, Port Authority employees, line handlers and other personnel needed to manage the site.

As noted, two specific sites were inspected but only one determined as well suited for these operations. The first site was on the south side of the fort, currently a grass covered field. The site is used for public activities and access would interfere with visitors to the park not associated with cruise activities (yellow). The second site is on the north side of the fort, shown in Figure 15. This location has reasonable access to access and egress roadways, close proximity to the pier and adequate land for bus queuing and worker parking (blue).

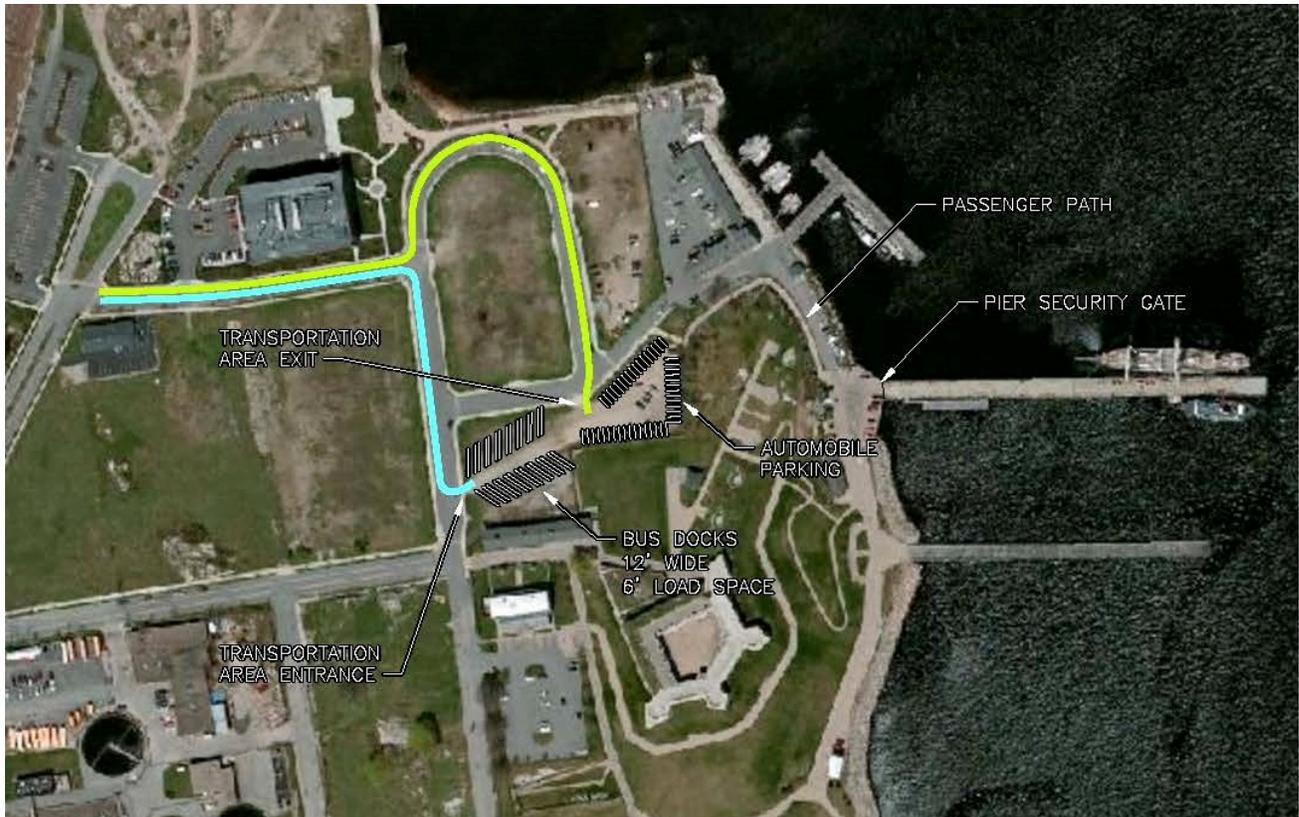


Figure 15: Recommended Ground Transportation & Parking Area and Circulation Pattern on north side.



Figure 16: Walking areas to Pier 7 on the south and north sides of the Fort.

This north site is preferred for the following reasons:

- Short walking distance between the parking/bus lot and the head of the pier, which is essential for older and physically challenged passengers
- Adequate space for both handling of buses and parking for personnel needed to meet vessel requirements (security, longshoreman, tour guides)
- Sufficient space to accommodate an estimated 15 to 20 buses at once
- Immediate access to local roadways
- Traffic flow for buses and cars that is separate and distinct, to prevent potential conflicts with drivers visiting the park who are unfamiliar with activities associated with cruise vessels.
- Open space with existing pathway lighting
- Two existing curb cuts to permit easy entrance to and egress from the lot for buses.
- Existing fencing for pedestrian and vehicle control
- Vehicle activity that is isolated from the historic context of the fort property

## **CRUISE SHIP REGULATORY REQUIREMENTS**

Cruise ship calls involve federal regulatory oversight and there are a number of regulatory requirements associated with the handling of cruise ships for port of call operations. The Pier 7 facility does not lend itself to homeport operations for cruise vessels, but is very suitable as a port-of-call. Cruise facilities generally involve a number of separate agencies, although most are under the oversight of the Department of Homeland Security (DHS). The port that hosts vessels is responsible at the terminal for conformance with these requirements. The infrastructure must be adapted to accommodate these regulatory requirements. The following outlines requirements associated with operations:

### **TERMINAL AND VESSEL SECURITY**

The Marine Transportation Act of 2002 created requirements for the handling of all international activities associated with international voyages including foreign and U.S. flag vessels. The regulations also include cruise ships of all sizes on international voyages. The regulations are specified under 33 CFR Part 105 and cover issues such as access to facilities and vessels, background and security checks of personnel, screening and management of marine terminal facilities in regard to security. Under the regulations, facilities that handle vessels subject to the regulations, must have approved security plans which are submitted to the US Coast Guard (USCG) for review and acknowledgement of conformance to the regulations. Given each port and terminal is different, the marine terminal operator submits the plan based on the regulations and the practices at the facility, and the USCG insures the regulations are met. The USCG does not approve the plan but provides regulatory conformance certification. The organization that submits is then held responsible to undertake what is in the plan. The USCG will inspect facilities and insure the plan is being followed.

The Transportation Security Administration (TSA) has been more involved in the last several years, and applies some procedural oversight at cruise facilities, which is similar to what is done at airports. The TSA is also responsible for background checks and the issuance of the Transportation Worker Identification Credential (TWIC) required for all personnel who are employed on regulated terminals. The TSA and USCG do coordinate activities, mostly at homeports, but the USCG still retains the regulatory lead. Screening is the responsibility of the vessel and there are numerous liability issues associated with who is responsible for screening when accessing the vessel over the terminal.

## **CUSTOMS**

Under DHS, US Customs & Border Protection (CBP) is required to vet all passengers on cruise ships, both foreign and US flagged, coming in from a foreign voyage. This includes all US Citizens, foreign citizens and crew. CBP is required to clear the vessel before anyone is allowed ashore if the previous vessel call was at a foreign port. If there are questions about the admissibility of persons, they can be detained or confined to the vessel. The vessel has controlled and limited access during this process which generally involves the review of advanced submitted manifests, checking of passports and, in facilities so equipped, formal screening similar to what takes place at international airports in specific CBP designated facilities.

## **HEALTH AND AGRICULTURE**

Under federal regulations, vessels may be screened by the US Department of Agriculture (USDA) for consumables or foodstuffs that may threaten the agricultural base of the United States. Generally, unless there is a specific concern, USDA inspectors do not regularly inspect cruise vessels. The Center for Disease Control (Federal and State) get involved with ship calls if wide spread health or cleanliness issues become apparent.

## **SAFETY**

Regulations for the safety of terminal workers, vessel crews and passengers are managed by the Occupational Safety and Health Administration (OSHA). There is a wide range of regulations that apply to terminal personnel and longshoremen. Each terminal is required to have a safety plan in place for the facility which conforms to those regulations. OSHA investigates all accidents that involve personnel on a terminal. The National Transportation Safety Board (NTSB) and the USCG also investigate accidents of a specific nature involving vessel damage to terminals, or injuries to personnel, as appropriate.

## **CABOTAGE**

Under the Jones Act, foreign flagged vessels (i.e. vessels not built in the US, crewed by US seamen, and registered in the US) are not permitted to transport passengers between US ports, similar to aviation cabotage rules. Cruise ship itineraries, most of which are foreign flagged, plan an inbound stop in a US port for CBP clearance on the return leg of a voyage from a foreign destination (including Canada). CBP will clear the vessel and except in emergency, passengers or crew may not sign off a vessel until it reaches its home port. New London is appropriate for home porting of some small American flagged cruise ships serving other US ports in the region.

## **REGULATORY INFRASTRUCTURE**

To accommodate regulatory requirements, the following should be planned for:

- A gatehouse at the head of the pier designed in to mirror similar historic structures on site and placed so as not to encumber service or emergency vehicle access to the pier.
- Passenger control lanes for access and egress.
- Improved fencing at the head of the pier.
- Additional lighting
- Directional and security signage
- Security camera system
- Access control system for gates and floating dock
- ID badge and automated access control equipment

## **FACILITY TARIFF AND TERMINAL RULES AND REGULATIONS**

The Connecticut Port Authority will need to publish a Facility Tariff and Rules and Regulations documents that provide protections to the State, list provided services, publish costs for those services and provide rules for the employed personnel who enter and use the site. A tariff is a policy document that is approved by the Port Authority Board and is implemented by staff. It is an implied contract and applies to all vessels, interests and personnel using the facility. Tariffs are common in the industry and are established for all public marine facilities including the State Pier in Lew London. This document is covered by Federal Maritime Commission Administrative Law and will be posted on the Port Authority's website.

The tariff document is not just a set of costs for users of the facility. It also contains provisions that protect the facility and its management from unnecessary litigation and liability, and sets the rules for using the facility by all who berth or enter the premises. All fees, services offered and terms and conditions are contained in the facility tariff. Fees that can be charged include:

- Dockage-Fee charged per linear foot for vessel handling
- Passenger Head Tax-Fee charged for each passenger aboard on ship
- Security Fee-Covers cost of 33 CFR Part 105 Requirements
- Water-Cover costs plus handling of water supplied to vessel
- License Fee-cost to service providers such as buses, taxis, limos, trash removal, supplies, deliveries, repair for doing business on site
- Line handling-provided by facility or contract stevedore

## **OPERATIONS PLAN**

The Operations Plan is a "how to" plan developed for the facility that explains how all activities are undertaken, how vessels are managed, how security and safety is addressed and how to insure that all personnel understand the procedures for handling a wide range of operations. It contains detailed information on who is responsible for what activities on the pier, how the site is managed, how ground transportation and traffic is managed, how passengers are managed including information and how to respond in emergencies.

Each operation begins with operational planning and use of the pre-vessel arrival operations check off sheet, shown in Figure 17. The plan and associated check-off sheet is provided to all responsible parties in advance including the vessel's representative (agent), security and bus contractors, staff, Coast Guard, police and fire departments, park personnel and other involved personnel. The Operational Briefing, based on the plan, is conducted before each evolution and the plan is utilized in case of emergency and provides a basis for Emergency Response Drills.

The operations plan is unique to each facility, contains maps and directions, management structures and specifies who is responsible for what and how all of the activities are coordinated. There is a wide range of personnel involved in crafting and executing the plan. It would be devised by the Port Authority, reviewed by the Park's management, shared with vessels calling on the site and would have specific Standard Operating Procedures (SOP's) for each type of vessel call. Security protocols would have additional procedures and check off but are not public because they are considered Security Sensitive Information (SSI).



**OPERATIONS CHECK OFF SHEET**

<b>EVOLUTION</b>	<b>RESPONSIBLE</b>	<b>DATE/TIME</b>	<b>INITIALS</b>
1. Security Protocols Enacted	Security		
2. Marine Operations Briefing	Stevedore		
3. Ground Transportation	GT Manager		
4. Pier and Site Cleaning/Trash	Staff		
5. Bathrooms and Vending	Staff		
6. Site Inspection for Hazards	Staff		
7. Control Fencing Properly Placed	Staff		
8. Information Racks/Visitor Brochures	Staff		
9. Vessel Trash Removal Protocols	Staff/Contractor		
10. Water Main (Sewer) Prepared/Meter Check	Staff/Agent		
11. Pier Safety Gear Check	Staff		
12. Supply Delivery Schedule	Staff/Agent		
13. Tender Float Controls Initiated	Staff/Security		
14. Ground Transportation Parking Area Opened	Staff/Contractor		
15. Tour Signage Placed	Contractor		
16. Control Center Opened	Staff		
17. Gangways Prepared and Positioned	Staff		
18. Safety Equipment Issued	Staff		
19. Vessel Spotting Protocols Reviewed	Staff		
20. Travel Routes Provided to Bus Drivers	Contractor		
21. Police and Fire Check-in	Staff/Security		
22. USCG and CBP Check-in	Staff/Security		
23. Park Department Check-in	Staff/Park Staff		
24. Operational Briefing-Staff Manager Led	All Personnel		
25. Site Personnel Check-in (60 min early)	Staff Manager		
26. Billing Procedures and Invoices	Staff Manager		
27. Maintenance Response Plan	Staff Manager		
28. Other Protocols as Appropriate			
a.			
b.			
c.			
29, Post Evolution Review	Staff Manager		

Date: \_\_\_\_\_ Manager: \_\_\_\_\_

**Figure 17:** Sample Operations Check-Off Sheet.

## **PERSONNEL REQUIREMENTS**

The management of cruise ship business development and operations requires a number of key personnel to run the operation properly. These include a cruise ship business development manager focused on marketing the port's facilities and an assistant in support of those efforts. On the operational side, a marine manager to oversee all operations, operational personnel or stevedore with longshoremen to handle pier responsibilities, a designated trained and certified Facility Security Officer (FSO), security officers and pier maintenance personnel. All of these personnel can be Port Authority employees, or all or some of the functions can be contracted to commercial entities. Each of these positions have specific job descriptions.

### **CRUISE SHIP BUSINESS DEVELOPMENT MANAGER**

Responsible for all research to promote the port as a cruise ship destination, setting up of cruise line meetings, preparation of promotional material, development of web site, development of protocols for visitor welcoming, posting of vessel call schedules for all vessels, participation in tourism and cruise coalition meetings, tracking of passenger and cruise line data, review of revenue and expenses, preparation of business development budgets, other tasks as appropriate. Generally provided with staff administrative support.

### **STEVEDORE**

A contracted management firm that handles marine operations on behalf of the vessel. The stevedore is typically hired by the ship, but is under the direction of the marine manager. The stevedore hires the longshoremen who are under the management of the contract stevedore, and handle the general labor requirements associated with vessel activities on the waterside and pier. This function may also be handled by Port Authority or Park staff.

### **FACILITY SECURITY MANAGER**

Is the designated responsible party for implementation of the USCG approved Facility Security Plan (FSP). The Facility Security Manager manages the contract or staff security force; liaisons with police; fire and federal agencies; manages security infrastructure; and other duties as required. This position typically reports to the Marine Manager, but in some cases may also be the Marine Manager.

### **MAINTENANCE PERSONNEL**

Under the Marine Manager, undertakes all maintenance requirements associated with vessel operations. May be park or Authority staff.

## **CONCLUSIONS AND RECOMMENDATIONS**

Although structural repairs and upgrades to the pier fendering and utilities are required to bring the facility back to a state of good repair, the Fort Trumbull State Park site is well suited for use by the US Coast Guard, Navy and other visiting vessels under 600 feet long. With the addition of a mooring dolphin at the end of the pier, vessels up to 700 feet long may be accommodated. The facility can effectively handle small to mid-size cruise vessels and their projected passenger and crew capacity. The harbor approach and berth depth is adequate for all of these type vessels.

To develop the facility for the expanded handling of public vessels and appropriate size cruise ships, HDR recommends the following steps be undertaken:

- Board and Park approval to move ahead
- Detailed site plan developed in collaboration with the State Park staff
- Engineering analysis of the pier structure, including:

- Hydrographic survey of the berths
- Mooring and berthing analyses to verify suitability of the pier to support the Eagle, US Navy vessels, and any potential cruise vessels that could utilize the facility.
- Plan for infrastructure improvements, including an incremental repair plan with estimated ranges of construction costs
- Development of tariff, safety and security plans
- Development of operations plan
- Public outreach meetings and stakeholder seminars
- Approved budget for improvements
- Undertake repairs and improvements

The potential for expanded use of the facility to support a variety of smaller military, cruise and other visiting vessels is a realistic opportunity if proactive and dedicated business development is undertaken, a proper operations plan is developed and necessary improvements undertaken. Fort Trumbull offers one of the most unique locations for calls by USCG *Eagle*, US Navy and upscale cruise vessels, and New London is a City that offers a number of interesting local attractions and is within a reasonable distance of unique tourism venues. A balance of military and cruise vessel calls can be achieved with little or no interruption to park activities and visitors including seasonal waterfront entertainment events. Finally, the handling of cruise vessels will generate revenue for the park in support of the maintenance of this interesting and historic site.