

2.2 Existing Buildings

2.2.1 Warehouse 14

Warehouse 14 is located on Berth 1 and was constructed during the 1920s as an on-dock facility to support lumber export at the Redwood Marine Terminal. More recently it has been used for wood pulp storage. It is the remainder of a larger structure that once covered approximately 92,000 square feet of the inter-tidal zone. Demolition of the southern portion of the warehouse reduced it to its present size of 36,000 square feet.⁴

The building is of redwood and fir timber construction, and has a pile supported, timber beam floor. A 2003 report concludes that the pile support and internal deck structure are capable of supporting a maximum load of 800 pounds per square foot⁵. This loading is consistent with most break-bulk cargoes but is insufficient to support modern container handling equipment.

Figure 2-5: Warehouse 14 Exterior



Source: TranSystems

Warehouse 14 has approximately 20 feet of vertical clearance at the north cargo entrance and about 36 feet of internal clearance to the bottom of the roof trusses. The exterior damage shown in Figure 2.5 is reported to be the result of a wind storm. The 2003 engineering report cited previously recommends that significant retrofitting and repair to the structure is necessary to bring it up to modern building code standards. In 2003, retrofit costs were estimated at \$1,061,190 (plus wind damage repair of \$35,000 to \$46,000). Replacement cost at that time was estimated to be about \$2,667,600. Currently the warehouse is not being used and plans for repair are pending a determination as to its future utility.

⁴ Anvick Engineering; Report for Wind Damage Evaluation of Building No. 14; June 1, 2006

⁵ Anvick Engineering; 2003 Retrofit Study Humboldt Bay Harbor Warehouse No. 14; April 29, 2003

Figure 2-6: Warehouse 14 Existing Pile Supported Pier

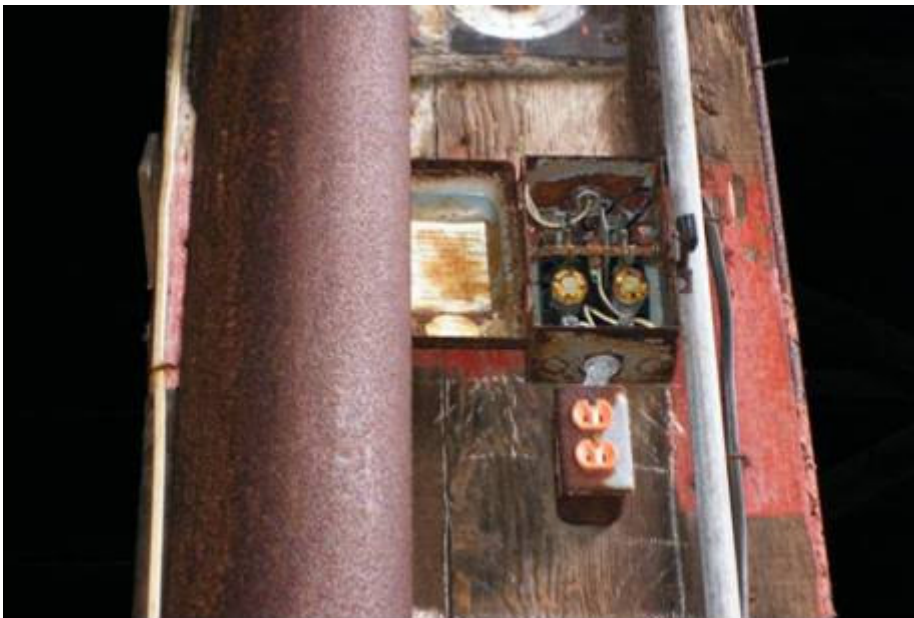


Source: TranSystems

The foreground of Figure 2.6 illustrates a gap in the deck of Berth 1 where another structure formerly stood. That structure has since been demolished and the berth was left in disrepair. In the background, the pile field supporting Warehouse 14 can be seen. Additionally the above ground electrical power connection and external flood lights can be seen on the north entry of the warehouse.

Figure 2.7 is representative of the existing wiring within Warehouse 14. Figure 2.8 shows a fire main, presumed to feed a sprinkler system within the warehouse. Debris seen in the background is due to windstorm damage to the buildings sheathing.

Figure 2-7: Warehouse 14 Wiring Sub-panel



Source: TranSystems

Figure 2-8: Warehouse 14 Fire Sprinkler Shut-off and Check Valve



Source: TranSystems

The electric systems are working but are disconnected due to stability concerns of the structure. Fire water systems in the warehouse are in working condition but are shut down due to leaks in the system.

The structural evaluations made by Anvick Engineering in 2003 and 2006 found that the structure can be retrofitted and used. However, it was also found that the existing “column member splices and blocks are not sound structural elements” and that substantial repair and retrofitting would be required to put Warehouse 14 back into economic use.⁶ Recommendations on whether to repair and retrofit warehouse 14 or to remove the structure will be driven by the findings of the market assessment and future facility requirements phases of the current feasibility study.

⁶ ibid

2.2.2 Warehouse 3

Warehouse 3 is of a newer construction and appears to be in moderately good physical condition. Figure 2.9 shows the exterior condition of Warehouse 3.

Figure 2-9: Warehouse 3 Exterior



Source: TranSystems

Warehouse 3 is approximately 16,000 square feet, built on the upland behind Berth 1. The structure is of timber construction with metal roof and roof trusses. This warehouse has a cement floor that appears to be a slab-on-grade. The metal roof in the warehouse appears to be in good condition with no visible sign of structural distress. The building has received recent maintenance and presently has no damage or leaks. The bay doors and internal vertical clearances are approximately 20 feet, large enough to allow for forklift and over-the-road truck operation. This warehouse is currently leased and used for the storage of commercial fishing gear and U.S. Coast Guard oil spill recovery equipment. Warehouse 3 is also designated as a Foreign Trade Zone⁷ but is not currently used in that capacity.

Figure 2-10: Warehouse 3 Interior



Source: TranSystems

⁷ Foreign Trade Zone program, Eureka Redevelopment Agency, City of Eureka

Figure 2-11: Warehouse 3 Timber Columns, Wall Structure and Fire Protection



Source: TranSystems

Fire extinguishers attached to the interior of Warehouse 3 are assumed to be new upgrades to the warehouse. The hose attached to the fire main inside the warehouse also appears to be well maintained. However, the sprinkler system has been disconnected due to leaks in the fire main.

Figure 2-12: Warehouse 3 External Fire Protection and Fire Main Control



Source: TranSystems

Figure 2-13: Electrical Junction Box



Source: TranSystems

The Junction box shown in Figure 2.13 appears to be original to the structure. The electrical system is said to work but is currently disconnected.⁸ An engineering evaluation of all utilities and fire protection systems will be necessary to return Warehouse 3 to any significant commercial service. In addition, the operability of doors, ventilators and lavatories will have to be confirmed. The cost of these repairs should not preclude future commercial use of this structure.

⁸ Interviews with staff of the Humboldt Bay Harbor, Recreation, and Conservation District.

2.2.3 Rail Sheds and Roundhouse

The Redwood Marine Terminal site includes four structures on the north end of the property, adjacent to the “Samoa Cookhouse” restaurant. These sheds were constructed around the turn of the last century to support the railroad activities at Samoa and include a small locomotive roundhouse, a locomotive maintenance shed and two ancillary sheds having a total of approximately 30,000 square feet of usable area. Figure 2.14 illustrates the relative location of the sheds and the Samoa Cookhouse. Although both facilities can be reached from Vance Road, there is a 10 to 20-foot elevation difference between the Cookhouse and the sheds. Therefore, vehicle traffic to the sheds must enter at or near the Marine Terminal entrance.

Figure 2-14: Maintenance Sheds and Roundhouse



Source: Humboldt Bay Harbor, Recreation, and Conservation District

The sheds are timber framed and constructed mostly of redwood. They are currently in varying condition and appear to all need some repair in order to be usable. The shed area is zoned Costal Dependent Industrial. However, in their present location and configuration, they are of limited value as components of a modern marine terminal.

Figure 2-15: Locomotive Shed



Source: TranSystems

2.3 Berths

2.3.1 Berth 1

Berth 1 of Redwood Marine Terminal is located on the north eastern portion of the property and is approximately 88 years old.⁹ The configuration of Berth 1 is that of a marginal wharf oriented parallel to the shore line. The intervening water surface is covered by a timber deck that extends from the shore line to the face of the wharf. Access to Berth 1 is via a short lane and gated entrance from New Navy Base Road, crossing Vance Road at the north end of the Harbor District property. If Berth 1 is returned to commercial service then either this road will have to be improved significantly, or an alternative route found into the terminal. The District secured an easement that allows access to Berth 2 from the public road. The alignment of the easement with port property is shown in Figure 2.4 and the survey of the easement is shown in Figure 2.5.

The berthing area is 600 feet long and is officially stated to have 30 to 35 feet of depth at mean lower low water.¹⁰ However, NOAA chart shows only 25 to 30 feet and visual evaluation at low tide found considerable sedimentation under the pile supported deck that may indicate the need for maintenance dredging in the near future.¹¹ The face of the wharf is about 335 feet from the present shore line and the pile supported timber deck covers approximately 280,000 square feet of the inter-tidal zone. Of those 280,000 square feet, approximately 80,000 square feet is damaged or missing the decking, and 36,000 square feet is under Warehouse 3. The adjacent shore line is revetted with stone rip-rap.

The berth structure is supported by creosoted timber piles, likely similar to the douglas fir piles found under Warehouse 14. The deck is timber 4" X 12" planks nailed to timber joists that cross much larger pile caps. The deck appears to be douglas fir, and although the pile caps may be redwood, the joists also are likely douglas fir.

Figure 2-16: Berth 1 Timber Deck



Source: TranSystems

⁹ Pacific Affiliates Consulting Engineers. 1994. Humboldt bay Harbor Recreation and Conservation District Final Environmental Impact Report for Louisiana-Pacific Corporation Samoa Terminal Reconstruction

¹⁰ Bar Pilots, Humboldt Bay Harbor, Recreation and Conservation District

¹¹ NOAA Chart Number 18622, May 1, 2007

The timber deck of Berth 1 varies in condition and load bearing capability. The deck shown in the foreground of Figure 2.16 is likely to have a capacity approaching that found inside Warehouse 14. However, the deck in the background extending towards the water is of unknown capacity and has been fenced against unauthorized vehicle access. Some portions of the deck are partially dismantled or have deteriorated to where damage is visible from the top.

Figure 2-17: Berth 1 Interior Piling Field



Source: TranSystems

Figure 2.17 illustrates an open piling field within the footprint of Berth 1 that is the site of a former, pile supported structure, since demolished. The middle of the background shows the pile cap, joist and plank construction of the remaining Berth 1 deck. The bearing capacity of this deck is unknown. Figure 2.18 shows the piling field and rip-rap shoreline at Berth 1. Warehouse 3 is on the shore, in the background.

Figure 2-18: Berth 1 Access Control Fencing



Source: TranSystems

The rip-rap used at the Redwood Marine terminal is similar to many other shore protection structures found along the west coast of the United States. Load placed on rip-rap shoreline protection should be minimized unless a structure is pile supported. Any dredging or deepening should not be performed within 50 feet of the tow of the rip-rap. This type of shoreline protection is easy to maintain and has minimal environmental impacts. The rip-rap in place at the Redwood marine terminal appears to be adequate in its current use with failure occurring in a few locations.

The access control fencing at Berth 1 (also shown in Figures 2.16 to 2.18) is not up to the standards set by the Maritime Transportation Security Act (MTSA) of 2002. The act requires that a terminal be 100% fenced, securing all terminal assets, and cargo from possible terrorist acts. This would fall under requirements of an approved security plan for the terminal mandated by the Department of Homeland Security (DHS).¹² Other requirements of an approved terminal security plan include:

- Access control and personnel credentialing
- Security guards, cameras and training
- Security information framework
- User and operator responsibility protocols

The District has an approved security plan that allows restricted use of the facility by cruise ships. No passengers are allowed to get off and on the ship at Berth 1. Instead they must be ferried by water between the cruise vessel and the City of Eureka's F-Street dock across the bay. Future development and commercial use of the Redwood Marine Terminal would require development of a comprehensive terminal security plan.

Figure 2.19 illustrates the existing fendering at Berth 1. It is likely that the berth was originally designed with fender piles that have since been removed or broken off. The current fender system is constructed of cable suspended tires. This type of fender is adequate for casual use by small vessels but is not capable of providing a secure mooring system for modern commercial ships.

Figure 2-19: Berth 1 Existing Fender System



Source: TranSystems

¹² Public Law 107-295, Maritime Transportation Security Act of 2002, Nov. 25, 2002, fully implemented by 2004 (<http://www.tsa.gov/assets/pdf/MTSA.pdf>)

Figure 2-20: Berth 1 Existing Mooring Point



Source: TranSystems

The mooring cleats as shown in Figure 2.20 are also adequate for smaller vessels and casual use. Their pull-out capacity is unknown and would be dependent on the condition of their attachment bolts. It is likely that the horizontal load capacity of the wharf exceeds the capacity of the mooring cleats.

The electrical systems on Berth 1 are said to be working but disconnected.¹³ This report recommends that the electrical systems be rebuilt if the existing Berth 1 structure were returned to commercial use.

Figure 2-21: Berth 1 On-Dock Electric Switch Box



Source: TranSystems

¹³ Interviews with staff of the Humboldt Bay Harbor, Recreation, and Conservation District

The on-dock fire control system is absent of routine maintenance. The system works but is disconnected due to leaks in the fire main. The system may require dismantling and rebuilding in the future. It is possible that the fire control systems do meet current fire code requirements. TranSystems recommends that the fire control systems be improved or rebuilt if Berth 1 were to be returned to commercial use.

Figure 2-22: Berth 1 On-Dock Fire Control Pressurized Stand Pipe



Source: TranSystems

The Redwood Marine Terminal is located in the portion of Humboldt Bay that receives tidal salt water exchange. Therefore, the piles and substructure of the pier do not receive seasonal fresh water incursion that can abate the growth of wood-boring organisms. These piles may be subject to deterioration at or below the lowest water line. Therefore, in order to assess the load capacity and future life of the Berth 1 timber structure, an underwater pile inspection will be necessary. A similar underwater pile inspection would also be required to determine the load bearing capacity of the structure beneath Warehouse 14. However, the justification for such inspections is not high in view of the findings of the prior studies on dock condition and the dock's unsuitability for modern cargo operations.

The condition of Berth 1, referred to as Redwood Dock in previous reports, was evaluated in 1994 by Pacific Affiliates Consulting Engineers for the Louisiana-Pacific Corporation. The analysis found that "its advanced age has resulted in a state of structural uncertainty." At the time of the analysis, it was determined that the dock should be demolished and rebuilt to modern terminal standards.¹⁴ Based on the prior analysis performed by Pacific Affiliates Consulting Engineers, and on site analysis performed by TranSystems, Berth 1 is not viewed as suitable for modern cargo and vessel handling operations in its current condition, and replacement is required to accommodate any new cargo activities recommended for the Redwood Marine Terminal.

2.3.2 Berth 2

Berth 2 is located at the south eastern end of the Redwood Marine Terminal, adjacent to the Evergreen Pulp Mill. This facility is configured as a typical "T-Dock," with a 568 foot long timber access pier perpendicular to the

¹⁴ Pacific Affiliates Consulting Engineers. 1994. Humboldt bay Harbor Recreation and Conservation District Final Environmental Impact Report for Louisiana-Pacific Corporation Samoa Terminal Reconstruction

shore line that connects to a berthing area that is parallel to both the shore line and the channel. In the case of Berth 2, there are two separate berthing areas; an outer berth or ship berth and an inner berth or barge berth.

The ship berth consists of a 60 foot X 70 foot loading platform, four fendered breasting dolphins, and two outer mooring dolphins. The entire ship berth extends approximately 1,160 feet along from mooring dolphin to mooring dolphin with an available berth length of approximately 900 to 1,000 feet, depending on vessel configuration. NOAA Chart Number 18622 shows a depth of 32 feet at the face of the ship berth¹⁵. This berth was originally used to unload liquid chlorine from ocean going vessels, via pipeline, to the adjacent pulp mill. The breasting and mooring dolphins are of concrete pile structure and appear to be in usable condition. However, the ship berth access pier (easternmost 178 foot section) and connecting catwalks have been declared unsafe for use as illustrated in Figure 2.23.

Figure 2-23: Berth 2 Ship Berth Access Pier



Source: TranSystems

The barge berth extends north for 355 feet, perpendicular to the access pier and parallel to the channel, about 390 feet from the shore. This berth consists of a 265 foot pier that varies in width from 25 feet where it connects to the access pier to 50 feet at the northern end. It also includes a 100 foot catwalk that extends the berth further north with two mooring dolphins approximately 50 feet on center. At the south end of the berth, there are two heavy timber fender dolphins to protect the access pier from impact from barges entering the berth (one of which is shown in the above photograph). The total length of available barge berthing is about 350 feet with a current depth of less than 15 feet¹⁶.

The deck of the barge berth supports a 30-foot by 75-foot, asbestos paneled shed that is approximately two stories in height. The shed houses a variety of equipment including a power generator and two large “Roots” type air compressors. The compressors are equipped with silenced intakes (as opposed to exhaust ports) and were capable of supplying a large quantity of low pressure air (less than 1 atmosphere.). The original purpose of the barge berth may have been pneumatic loading or unloading of either wood chips or pelletized pulp. However, none of the existing systems are in operating condition.

¹⁵ NOAA Chart Number 18622, May 1, 2007

¹⁶ *ibid*

Figure 2-24: Berth 2 – Barge Berth Access Pier



Source: TranSystems

Figure 2-25: Berth 2 – Barge Berth Equipment Shed



Source: TranSystems

The barge berth and the shed as shown in Figure 2.24 includes various piping and control systems that appear to be designed for the unloading of chemicals and other resources necessary for the processing of wood pulp. The berth has water and electric service and they appear to be in working condition. The decking of the Berth 2 access pier, the barge berth pier and the associated catwalks are constructed of pile supported timber planks. The load bearing characteristics of the pier are unknown and would require further evaluation. The barge berth and the associated access pier appear to be in adequate condition for commercial use. However, a structural evaluation will be necessary before equipment or vehicles can use the facility.

Berth 2 is not directly accessible from Berth 1 or the rest of the Redwood Marine Terminal property. The District has secured an access easement from New Navy Base Road, along the northern boundary of the Evergreen pulp mill property to the access pier at Berth 2. The location of this recorded easement is shown on Figure 2.4. The easement runs parallel with the Evergreen and Simpson Samoa property boundaries on the Evergreen side.

The easement allows access from New Navy Base road to Berth 2 via an area located behind the wood chip storage in the northeast corner of Evergreen’s property boundary. The current configuration of the District Property does not allow direct access between Berth 1 and Berth 2. Use of the easement will allow direct access to Berth 2 from New Navy Base Road without impacting the operations of Evergreen.

2.3.3 Pre-Existing Cogeneration Plant Water Intake Berth

The berth was used to take in water to the pre-existing pulp mill. TranSystems views this berth as having no value for cargo handling operations. Several companies have expressed interest in using the berth for aquaculture activities.

Figure 2-26: Pre-Existing Cogeneration Plant Water Intake Berth



Source: TranSystems

2.3.4 Unnamed Harbor District Dock

The dock was once a part of LP and Simpson Samoa operations but is no longer in use. It is unfit for commercial or recreational use. The removal of the dock could be used as mitigation for future terminal development.

Figure 2-27: Unnamed Harbor District Dock



Source: TranSystems

2.4 Open Storage

The Redwood Marine Terminal open storage includes about 17 acres of mixed paved and unpaved areas. The surface of the unpaved areas is currently overgrown with low vegetation and the original surface conditions, (gravel, earth, etc.) have not been evaluated. The paved surfaces are relatively clear and appear to be in good condition. This pavement is fully contiguous with paved portions of the adjacent Samoa Property and it can be assumed that the existing drainage and underground utilities are common to both. Portions of the pavement closest to the entry gate, Roundhouse, and Berth 1 appear to have the greatest structural integrity. Figure 2.28 illustrates portions of that pavement to the north of Berth 1 and Warehouse 3, facing the terminal entrance.

Figure 2-28: Open Storage Pavement North of Warehouse 3



Source: TranSystems

Some areas of the pavement show minor damage, but there is little evidence of excessive pavement failure or overloading. This paved area was originally used for storage of sawn timber and heavy truck circulation. Although the design pavement load is unknown, it may be suitable for commercial port use without significant modifications.

Figure 2-29: Open Storage Vegetated Areas and Fire Protection Utilities



Source: TranSystems

2.5 Fire Main Pump Station

The Fire Protection Pump Station (see Figure 2.30) is located on District property and is the primary fire protection for the Redwood Marine Terminal, Simpson Samoa, and the town of Samoa. The Pump Station falls under a shared services agreement between the District and Samoa Pacific Group, which covers future use of utilities. The Samoa Master Plan observed that some portions of the fire control system are sub-standard while other parts are above standard. It is intended that the pump station remain with future terminal re-development and that appropriate upgrades to the fire system be implemented to support modern terminal operations.

Figure 2-30: Fire Main Pump Station



Source: TranSystems

2.6 Conclusions on Existing Terminal Infrastructure

The Redwood Marine Terminal has sufficient land acreage and waterfront to support development of modern cargo terminal operations, based on the site visits and analysis of facilities conducted by the project team. TranSystems also confirmed the site's suitability for development by conducting a series of tests where different representative terminal configurations were superimposed on the existing site to show relative massing, land requirements, aspect ratios and adjacency issues.

The current terminal infrastructure (berth, etc.) is not in suitable condition for modern cargo operations. Development of new terminal infrastructure (berths, etc.) would be required to meet the needs of shipping lines, terminal operators and shippers. Elements of the terminal's existing infrastructure could provide environmental mitigation towards re-development of the property.

An adjacent parcel, held by the Samoa Pacific Group, LLC and zoned "Coastal Dependent Industrial" may be available for co-development of a future terminal. Such co-development would offer a larger area for potential uses and may enhance the marketability of the District's property. Potential terminal configurations and recommended development strategies, driven by the Market Demand analysis in Task 2, are described in Task 3 of the study.