



**Port of Port Orford Economic Development
Declaration of Cooperation
June 22, 2009**

Introduction

The Port of Port Orford is a small port on the Southern Oregon Coast. It is unusual in that it is directly on the ocean and the fishing boats that use its services are “hailed out” of the ocean onto the dock when the boat is “at port.” The direct access to the ocean is a benefit and a challenge. The benefit is the direct access to the ocean for the fishing industry. The challenge is the direct access the ocean has to the infrastructure of the port. Occasional severe weather damages the port buildings and infrastructure and deposits sand in the harbor.

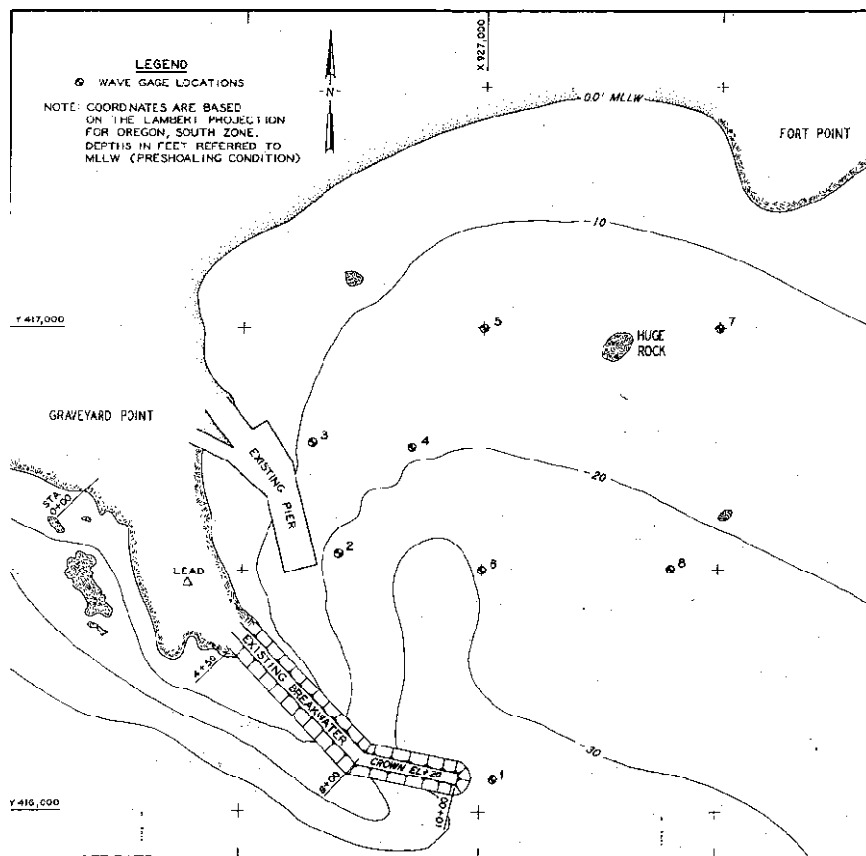
In March, 2008, at the request of the Port of Port Orford and the Port Orford Ocean Resource Team, Governor Kulongoski designated the Port Orford Marine Economic Development Project as an Oregon Solutions project and he named Mayor Jim Auburn and Councilman John Hewitt as the Co-conveners (Appendix 1). Since that time, the various project stakeholders have been actively seeking collaborative solutions to the two challenges of sand shoaling into the harbor and replacing the building infrastructure at the port to serve the fishing industry and community.

Background

SHOALING

The Port of Port Orford on the southern Oregon coast is unique in that it is not inside a natural bay or river. The harbor is in a natural cove with a rock headland to the north and west. The port provides the fishing industry direct access to the ocean and ocean waves from the south have direct access to the infrastructure of the port. Prior to 1935, the frequent southwesterly winter storms caused extensive damage to harbor facilities. In 1935, local interests built a breakwater to the south and west to protect the pier. It was not totally effective so in 1968 the federal government extended the breakwater by 550 feet.

The resulting harbor looked like this:



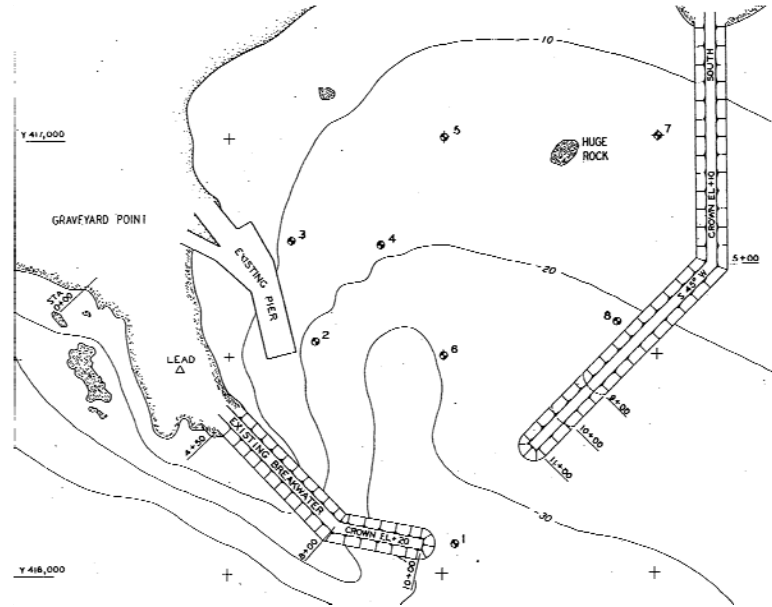
Unfortunately, shortly after completion of the breakwater extension, the harbor area began to accumulate sand. In 1970 emergency dredging was required. In 1974, The Corp of Engineer described the problem:

Sands located [in the vicinity of Port Orford] terminated at its northern end by the Port Orford headland tend to move from south to north during winter storms. Summer storms reverse the direction of the sediment [resulting in] movement toward the south. Construction of the breakwater at Port Orford sufficiently altered conditions so that prevailing summer winds and currents are no longer able to move the accumulation of sediment at the northern end of the [area at the pier] back toward the south, and the [water depth] will continue to stabilize at approximately 3 to 15 feet [compared with former depths of 8 to 25 feet.]¹

To put it simply, winter storms move sand along the coastline from the south to the north. Sand was stopped by the breakwater and accumulated under the dock making the water more shallow. A natural process of summer winds and storms could not move the sand out and back to the south because the breakwater prevented wind and water currents to move through the area.

¹ Giles, Chatham; Remedial Plans for Prevention of Harbor Shoaling, Port Orford, Oregon; US Army Corp of Engineers, 1974, page 2.

In 1974, the Corp of Engineers made a physical model of the harbor and tested various scenarios. It concluded that the best way to prevent shoaling was to construct an east breakwater. The resulting harbor would look like this:



This plan was not funded.

In 1996 the Port of Port Orford constructed a solid face dock. Engineers told the Port that the sheet piling would create a scouring effect that would take sand away from the dock. After construction the sand continued to accumulate and the prediction of scouring did not occur.

Today the sand continues to accumulate against steel sheeting along the face of the dock making the water at times too shallow for fishing boats to be taken out or put into the water. Meanwhile the natural flow of sand from the north in the summertime piles against the ocean side of the breakwater. This allows huge waves from a southwest winter storm to roll up and over the breakwater into the harbor. Occasionally wave water twenty-five feet high crashes across the dock moving and destroying equipment on the dock.

BUILDING

The primary building at the Port of Port Orford, known as the cannery, is in major disrepair. The concrete floor is caving in, big sections of siding are missing and the formerly refrigerated space and the upper floor are not usable. Everyone interviewed for the project assessment agreed that a replacement building is needed. On the ground floor the building currently houses live fish tanks which are used by Nor-Cal Seafood of Oakland, CA.

Current port tenants would like a new building. Nor-Cal would like to expand the number and size of its live fish tanks. This fishery is economically important to the commercial fishing industry since Nor-Cal pays \$2 to \$7 per pound for live fish. Hallmark Fisheries is also

economically important to the fishing industry in Port Orford since it purchases all the commercial seafood catch that is not destined for the live fish market such as Dungeness Crab and Black Cod.

Griff's Restaurant currently rents a one-story building located in the middle of the dock. The restaurant has a growing clientele and its owner would like to expand and secure a location with an ocean view.

Additionally, a new building could provide space for the Port of Port Orford administration. The Port is currently in a small metal building housing one office and a windowless room used for board meetings and storage of Port records. It could use more space for its office and public meetings.

The Port Orford Ocean Resource Team (POORT) is a local non-profit with a long-term commitment to sustainable local fisheries. The organization is working diligently² to obtain federal grant funding to build a marine research station in Port Orford.

Oregon Solution Process

The Port Orford Oregon Solutions Team divided its primary tasks into two workgroups, a Building Workgroup and a Shoaling Workgroup. These two groups worked in tandem to produce this Declaration of Cooperation.

SHOALING

The Shoaling Working Group³ was formed of highly respected expert scientists and others with extensive local knowledge. Its task was to advise Port Orford on the best way to remove or prevent the shoaling. The group initially concluded that installation of an east breakwater was the best long term option to prevent shoaling. This option was also modeled in a study in 1974.

However, this option would require a substantial federal investment and the Congressional members of the Oregon Solution Team advised that it was not a financially feasible option.

The Shoaling Working Group met again and made the recommendations presented in Appendix 2. The recommendation that the Port of Port Orford submit a formal request to the US Army Corp of Engineers (ACOE) was accepted and acted upon almost immediately. The ACOE took action and requested money from the federal government to study the best way to repair the

² See Elizabeth Sheehan, Building a Community Development Approach for the Port Orford Ocean Resource Team, Report to the Community, July 2007

³ Jonathan Allen, Coastal Geomorphologist; Coastal Section Leader, Oregon Department of Geology and Mineral Industries; Gary Anderson, Port of Port Orford Manager; Jim Bailard, President, Scour Systems, Inc., Carpinteria, CA; John Craig of the US Army Corp of Engineers; John Dingler, Coastal Oceanographer Emeritus, US Geological Survey; Ed Dowdy and Scott Luhr, Port of Port Orford Commissioners; Paul Komar, Professor Emeritus, Oregon State University, College of Oceanic and Atmospheric Sciences; Aaron Longton, Port Orford commercial fisherman; Chuck Nordstrom, retired Curry County Planner; and Dave Revell, Project Manager, Philip Williams and Associates Ltd., San Francisco CA.

breakwater. In April of 2009, the ACOE received \$120,000 to conduct its study and it has begun that process. The ACOE also agreed to respond to other recommendations by the Shoaling Working Group such as determining the current cost of building an east breakwater.

The Shoaling Working Group recommended that the best way to determine the long term solution to preventing shoaling would be to create a computer model of the harbor and then test scenarios using that model. The numerical model would analyze the harbor's environment as it existed prior to the construction of the breakwater, and how it was modified by the construction to create the existing conditions. The modeling would:

- a. quantify both the processes that are causing the existing shoaling problems and the responses to dredging such as the rapid movement of the beach sand into the dredged area as found in recent beach surveys.
- b. include waves, near shore currents and patterns of sand transport and accumulation in the harbor.
- c. include local bathymetry and beach topography, locations of existing and proposed structures, and the near shore wave field for both storm and swell conditions.
- d. be calibrated using measured wave conditions (at a minimum), long shore currents, and sediment transport directions and rates.
- e. examine the effectiveness and environmental impacts of an east breakwater.
- f. evaluate of the functionality of smaller scale structures, such as a groin or sheet-pile wall that runs perpendicular to the beach to Huge Rock.
- g. Evaluate several alternative breakwater, navigation channel, and beach configurations that have been discussed by the community and identified by the ACOE

The cost estimates of such a model range from \$100,000 for a non-validated estimated model to \$200,000 for a validated, precise model.⁴

BUILDING

The Building Working Group met several times and produced preliminary designs for a building to replace the existing cannery building and to convert the existing footprint of Griff's Restaurant into a combined fish-cleaning station, blast freezer space and public restrooms. An additional building was also designed for Port offices, a restaurant and the marine research station. The Port took on the task of determining the specific cost of each of these improvements with the help of a contractor, David Cheramy of Maritime Consulting International.

The opportunity to construct these building without long term financing arose with the passage of the American Renewal and Reinvestment Act (ARRA). The proposal to the Oregon Way Advisory Group, which will make recommendations to the Governor of Oregon for submission for federal funding states:

[T]his project began as an Oregon Solutions Project, a truly "Oregon Way" of approaching and solving problems. In Port Orford, the Oregon Solutions project

⁴ Conversation with Tuba Ozkan-Haller, Assistant Professor of Coastal & Ocean Engineering and Marine Geology & Geophysics (COAS) at Oregon State University
Oregon Solutions - Port Orford Marine Economic Development
Declaration of Cooperation – Page 5 of 24

was convened with the express purpose of stimulating economic development by supporting the fishing industry and enhancing tourism. . . .

As a direct result of the efforts of the parties to the Oregon Solutions process, this project proposal emerged.

The proposed buildings and their designs are attached in Appendix 3; however, the designs are being revisited to accommodate requirements of applicable federal grants.

Commitments

The commitments represented below form a public statement of intent to participate in the project, to strive to identify opportunities and solutions whenever possible, to contribute assistance and support within resource limits, and to collaborate with other team members in promoting the success of the project. All team members acknowledge that the best solutions depend upon cooperation by all entities at the table. Accordingly, they recognize that each party has a unique perspective and contribution to make, and legitimate interests that need to be taken into account for the project's success. They also recognize that continued collaboration is necessary to achieve that success and have therefore agreed to create and maintain a self governing collaborative structure that will ensure the project's completion and fulfillment of ongoing support needs.

This Declaration of Cooperation, while not a binding legal contract, is evidence to and a statement of the good faith and commitment of the undersigned parties. The undersigned parties to this Declaration of Cooperation have, through a collaborative process, agreed and pledged their cooperation to the findings and actions listed under their names:

THE PORT OF PORT ORFORD

The Port of Port Orford is one of the original co-sponsors of this project. They view this project as strongly supportive of their mission to create economic vitality for the Port Orford region.

In support of the Port Orford Economic Development Project, the Port will assume responsibility for the following:

1. Take the lead in developing an on-going collaborative structure to pursue completion of the project beyond the involvement of Oregon Solutions. Make it a Standing agenda item at each monthly meeting.
2. Shoaling:
 - a. Seek funds to conduct computer modeling of the harbor to determine what structures will reduce or prevent existing shoaling in the harbor.
 - b. Manage the computer modeling contract and data verification process.
 - c. Seek funds for the recommendations suggested by the modeling.
 - d. Conduct a public process to inform citizens of efforts to resolve shoaling issue.
3. Building:
 - a. Cooperate in obtaining funds required for final design and construction.
 - b. Assume the lead agency role for managing construction of the buildings once funding is secured.
 - c. Build buildings to LEED standards, provided that any required additional costs are fully funded by grants.
 - d. Complete the relocation of conflicting infrastructure (*e.g.*, sewer pumping station).
 - e. Occupy one of the buildings with Port offices as identified in the conceptual plans.
 - f. Support establishment and operation of the Marine Research Station.
4. Support City of Port Orford's petition to ODOT for signage to the Port of Port Orford on Highway 101.
5. Port Orford Economic Development:
 - a. Support joint marketing efforts of Port Orford project team members.
 - b. Support development of the walking trail from Battle Rock to the Port.
 - c. Support sale of fresh seafood from Port Orford based vessels to Griff's restaurant.

Signed: Robert J. Muelz

Date: 6-22-09

Title: Vice President

PORT ORFORD OCEAN RESOURCE TEAM


The Port Orford Ocean Resource Team is the other co-sponsor of this Oregon Solutions process. In support of the Port Orford Economic Development Project, POORT will assume responsibility for the following:

1. Shoaling:
 - a. Support the public process to inform citizens of efforts to resolve the shoaling issue.
 - b. Support the Port's efforts to obtain funding for the modeling study as well as implementation of study recommendations.

2. Building:
 - a. Participate in education opportunities with the Port Orford Langlois School District.
 - b. Support the Port's efforts to build to LEED standards.
 - c. Cooperate with the Port in seeking grant funding to build the marine research field station and work to establish cooperative partnerships with the agencies listed below for the operation of the marine research field station:
 1. Oregon Fish and Wildlife
 2. University of Oregon - OIMB
 3. OSU - Coastal Oregon Marine Experiment Station
 4. Sea Grant

3. Support City petition to ODOT for signage to the Port of Port Orford.

4. Port Orford Economic Development:
 - a. Support joint marketing efforts of Port Orford project team members.
 - b. Support development of the walking trail from Battle Rock to the Port.
 - c. Support sale of fresh seafood from Port Orford based vessels to Griff's restaurant.

Signed: 
Title: Aaron Langston

Date: 6

US ARMY CORPS OF ENGINEERS

In support of the Port Orford Economic Development Project, the US Army Corps of Engineers Portland District will assume responsibility for the following:

Shoaling:

1. Conduct a study to plan for repair of the existing breakwater.
2. Meet with the public in Port Orford and keep them informed about the progress of repairing the existing breakwater.
3. Make emergency repairs to the existing failing breakwater sections.
4. Participate in design of computer modeling of the harbor to determine what structures will reduce or prevent existing shoaling in the harbor.
5. Consider using modeling results to design and construct new structures as necessary permits and funding are obtained.
6. Provide a preliminary cost estimate for the construction of an east breakwater, based on the 1974 WES design.
7. Continue dredging as necessary to remove accumulated sand in order to maintain nominal functionality of fishery fleet operations at the Port facilities.
8. Support the Port's public process to inform citizens of efforts to resolve the shoaling issue.

Signed: _____

Date: _____

Title: _____

CONGRESSMAN PETER DEFAZIO

Congressman Peter DeFazio has demonstrated a strong personal interest in this Oregon Solutions process and is supportive of its goals to increase collaboration between local agencies, improve the public’s understanding and appreciation of coastal and ocean resources, and strengthen the Port Orford and Curry County economy. His office has been represented by coastal representative, Ron Kreskey, who has been instrumental in keeping the Project Team informed about Congressional issues, processes and priorities. Congressman DeFazio’s office will continue to monitor the progress of the Port Orford Economic Development Project and will assist the Team in identifying potential federal resources to help implement the project’s objectives.

Signed: _____

Date: _____

Title: _____

NOR-CAL FISHERIES

In support of the Port Orford Economic Development Project, Nor-Cal Fisheries will assume responsibility for the following:

1. Shoaling:
 - a. Support the public process to inform citizens of efforts to resolve the shoaling issues.
2. Building:
 - a. Occupy the Fishery Building subject to satisfactory lease negotiations.
 - b. Support the Port's efforts to build to LEED standards of the buildings.
 - c. Accommodate POORT's use of a wet lab in the Fishery Building.

Signed:  Date: 6-22-09
Title: NorCal Fisheries
Vicky Nowlin

GRIFF'S SEAFOOD

In support of the Port Orford Economic Development Project, Griff's Seafood will assume responsibility for the following:

1. Building: Occupy the portion of the retail space planned for restaurant use subject to financial feasibility and provided the Port of Port Orford provides:
 - a. Space built to suit including wiring, plumbing and window placement.
 - b. Ocean view for customers
 - c. Men and women restrooms to code
 - d. Entrance door on front of building near parking
 - e. Separate supply door and service entrance
 - f. Support for installation of Class A liquor license and gaming machines
 - g. No lapse in space availability for restaurant during transition from current location to new location.
2. Support effort to locate sign of business at the port on Hwy 101.
3. Port Orford Economic Development:
 - a. Support joint marketing efforts of Port Orford project team members
 - b. Support walking trail from Battle Rock to the Port
 - c. Purchase fresh seafood from Port Orford based vessels for use in restaurant and seafood market.


Signed: Patricia McGriff
Title: General Manager
Patricia + Gerald McGriff

Date: 6/22/09
C = 22-09

HALLMARK FISHERIES

In support of the Port Orford Economic Development Project, Hallmark Fisheries will assume responsibility for the following:

1. Support the public process to inform citizens of efforts to resolve the shoaling issues.
2. Support the efforts of the Port of Port Orford and the US Corp of Engineers to obtain funding for repair to the existing breakwater
3. Support the Port of Port Orford in obtain funding for continued dredging of the harbor.

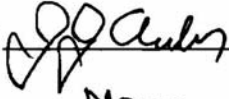
Signed: 
Title: MANAGER
Jack Emmons

Date: 6-22-09

CITY OF PORT ORFORD

In Support of the Port Orford Economic Development Project, the City of Port Orford will assume responsibility for the following:

1. Shoaling:
 - a. Support the public process to inform citizens of efforts to resolve the shoaling issues.
 - b. Support the applications for project funding.
2. Building:
 - a. Petition ODOT for signage to the Port of Port Orford
 - b. Support establishment of the POORT Research station
3. Port Orford Economic Development:
 - a. Support joint marketing efforts of Port Orford project team members
 - b. Take the lead in establishing a walking trail from Battle Rock to the Port

Signed:  _____ Date: 22 June 2009

Title: Mayor

Jim Auburn

PORT ORFORD-LANGLOIS SCHOOL DISTRICT

In support of the Port Orford Economic Development Project the Port Orford-Langlois School District will assume responsibility for the following:

1. Support the public process to inform citizens of efforts to resolve the shoaling issues.
2. Participate in education opportunities at the Port with POORT
3. Support establishment of Marine Research station

Signed: Mick Lane

Date: 6/22/08


Title: Superintendent

Mick Lane

PORT ORFORD AND NORTH CURRY COUNTY CHAMBER OF COMMERCE

In support of the Port Orford Economic Development Project, the Port Orford and North Curry County Chamber of Commerce will assume responsibility for the following:

1. Support the public process to inform citizens of efforts to resolve the shoaling issues.
2. Support City petition to ODOT for signage to the Port of Port Orford
3. Support establishment of the Marine Research station
4. Support joint marketing efforts of Port Orford project team members
5. Support development of the walking trail from Battle Rock to the Port

Signed:  Date: 6-22-09
Title: President

CURRY COUNTY

In support of the Port Orford Economic Development Project, the Governor’s Economic Revitalization Team will assume responsibility for the following:

1. Assist in developing an on-going collaborative structure to pursue completion of the project beyond the involvement of Oregon Solutions.
2. Assist in identifying state resources that can assist in project development.
3. Keep Curry County government informed about the status of the project.
4. Actively support the pursuit of funds in support of project objectives.
5. Support joint marketing efforts of Port Orford project team members.
6. Support development of the walking trail from Battle Rock to the Port.

Signed: _____

Date: _____

Title: _____

GOVERNOR'S ECONOMIC REVITALIZATION TEAM

The Governor's Economic Revitalization Team has played an active and supportive role in this project, particularly through the involvement of the Southwest Oregon ERT Coordinator, Jeff Griffin.

In support of the Port Orford Economic Development Project, the Governor's Economic Revitalization Team will assume responsibility for the following:

1. Assist in developing an on-going collaborative structure to pursue completion of the project beyond the involvement of Oregon Solutions.
2. Assist in identifying state resources that can assist in project development.
3. Keep state agencies and Governor's Office informed about project status.
4. Actively support the pursuit of federal funds in support of project objectives.

Signed: Jeff Griffin

Date: 6-22-09

Title: Regional Coordinator



THEODORE R. KULONGOSKI
Governor

March 18, 2008

Mr. Gary Anderson
Port of Port Orford
300 Dock Rd
Port Orford, OR 97465

Ms. Leesa Cobb
Port Orford Ocean Research Team
P.O. Box 679
Port Orford, OR 97465

Dear Mr. Anderson and Ms. Cobb:

Your letter requesting the Port Orford Marine Economic Development Project be designated as an Oregon Solutions project has just come to my attention. After reviewing the letter and the assessment conducted by the Oregon Solutions staff, I feel that the project supports Oregon's Sustainable Community Objectives, encompassing environmental, economic and community objectives. By this letter I am designating this project as an Oregon Solutions project and appointing Mayor Jim Auburn and Councilman John Hewitt as the co-conveners.

This project is important to your community and to other communities in Oregon that rely on the fishing industry for a major part of their livelihood. I'm pleased that you are engaging the public, private and civic sector to work towards a solution.

The Oregon Solutions Community Governance System will help you bring together the potential partners in a collaborative way to address issues and needs early-on, leverage state and other investments, and gain commitments to help implement the project. In addition, this community-based approach may serve as a model for other communities throughout the state.

Thank you for your hard work and enthusiasm thus far. Please keep me updated on the progress of this project.

Sincerely,

THEODORE R. KULONGOSKI
Governor

TRK:m:lj
c: Ray Naff, Governor's Economic Revitalization Team
Steve Greenwood, Oregon Solutions
Jeff Griffin, ERT Regional Coordinator

STATE CAPITOL, SALEM 97301-4047 (503) 378-3111 FAX (503) 378-4863 TTY (503) 378-4859
WWW.GOVERNOR.OREGON.GOV

Appendix 2

Recommendations of the Shoaling Work Group

1. **Modifications to the existing breakwater:** The existing breakwater is severely damaged and could totally fail in the near future. In some respects, that would return the area to its pre-breakwater state. However, changes to the pier, the scattered rock from the breakwater, and the post-breakwater shallowness of the harbor could make conditions substantially different and more dangerous than before.

1.1. Submit a formal request to the US Army, Corps of Engineers to repair the breakwater. They are responsible for maintaining it, as well as the navigation channel, but need a request from the Port to start the repair process.

1.2. In addition to the request to repair the breakwater, request that protective rock be placed along Graveyard Point to prevent storm waves from sweeping across the pier. This should be part of a breakwater repair project, but should be explicitly brought up.

1.3. Undertake numerical model analyses of the harbor's environment as it existed prior to the construction of the breakwater, and how it was modified by the construction to create the existing conditions. Such modeling would quantify both the processes that are causing the existing shoaling problems and the responses to dredging such as the rapid movement of the beach sand into the dredged area as found in recent beach surveys. The models should include waves, nearshore currents and patterns of sand transport and accumulation in the harbor. In 1974, WES (the Waterways Experiment Station) studied the harbor with and without the breakwater using a physical model. Now, sophisticated computer models are available, permitting more precise analyses that better account for the processes. Such models can be undertaken at less expense than physical models. A model for Port Orford should include local bathymetry and beach topography, locations of existing and proposed structures, and the nearshore wave field for both storm and swell conditions. The model should be calibrated using measured wave conditions (at a minimum), longshore currents, and sediment transport directions and rates.

2. **New protective structures:** The 1974 WES study, using a physical model, tested several variations of an east breakwater. They found that a properly designed structure would create a safe haven in the harbor under storm waves without extensive shoaling in the harbor. Their photographs of the model also suggest that a large bar would not form at the entrance. Based on the results of their study, it is clear that the construction of an east breakwater represents the most certain solution to the Port's shoaling problems.

2.1. Request that the Corps of Engineers provide a cost estimate for the construction of an east breakwater. Although an accurate estimate would be a part of a formal study, a preliminary estimate, based on the 1974 WES design, should be doable without major time or expense. This would be undertaken to decide whether cost-wise it is justifiable to undertake numerical models to investigate the construction and design of an east breakwater. Using the numerical model setup for the existing breakwater, described above, there should not be significant added costs to examine the effectiveness and environmental impacts of an east breakwater.

2.2. Identify several alternative breakwater, navigation channel, and beach configurations that have been discussed by the community. These should be evaluated as part of the numerical model described above in 1.3.

2.3. Request a preliminary evaluation of the functionality of smaller scale structures, such as a groin or sheet-pile wall that runs perpendicular to the beach to Huge Rock. This should be a part of the numerical model analyses described above.

2.4. Engage local government, community members, and environmental groups in a discussion of possible impacts to the coast with an east breakwater. The harbor sits at the downdrift end of a littoral cell, so a breakwater should not have an impact on the coast north of the harbor. However, it will have an impact on the beach to the south. The impact could be negative in that sand could build up in the area around Battle Rock. It could also be positive if there is a design that would allow the littoral sand to easily move along the outside of the structure into deeper water.

3. **Dredging:** Since the construction of the west breakwater, the harbor has required periodic dredging to permit safe movement of the fishing fleet and other vessels. As dredging costs have risen, sufficient funding has been harder to obtain on a timely basis, thus exposing vessels to dangerous conditions at the pier during storms. Dredging in the past has not always resulted in the desired period of deep water within the harbor, as in some years storms have quickly transported sand back into the dredged area.

3.1. Work with the Corps of Engineers, the State of Oregon government, and federal legislators to develop a strategy to improve the funding procedure.

3.2. Investigate and produce a proposal for the use of a small, portable dredge to pump sand from the harbor to deeper water west of Graveyard Point in a manner that would permit cost-effective dredging as needed.

3.3. Request a determination of the maximum amount of sand that the State will allow pumped into the area west of Graveyard Point. The volume permitted at the present may be insufficient if a portable dredge is employed.

3.4. Investigate relocating the existing disposal site off the end of the west breakwater. Although present thought is that sand does not return to the harbor from the present site, its location is such that waves could push sand back.

4. **Sand removal from Pier Beach:** One way to reduce sand shoaling in the harbor is to extract sand from the beach adjacent to the pier. Before the west breakwater existed, there was no beach—photographs show a rocky shoreline adjacent to the road to the pier. By reducing the size of the beach, the amount of sand immediately available to fill in the harbor would be reduced. Furthermore, it is possible the nearshore profile would shift shoreward creating deeper water at the pier. However, as long as there is no protective breakwater or groin to the east, the removal of beach sand would only bring short-term relief and would have to be repeated much as dredging is.

4.1. Determine the volume of sand on the beach through profiles and ground penetrating radar.

4.2. Locate disposal sites. These could include the beach to the north and inland areas such as old quarries.

4.3. Determine the cost of removal of the extracted beach sand by truck to an inland site or by pipe to the beach in front of Garrison Lake. This has been done in other areas—Matilija Dam in Ventura County for example—so the information should be readily available.

4.4. Request a mitigation proposal for the endangered plant, pink sand verbena, which grows on part of the beach. This plant, which cannot compete with European beach grass, grows on exposed sandy areas so it likely arrived after the post-breakwater beach formed.

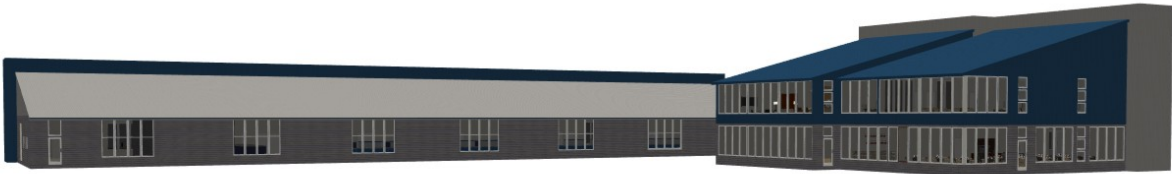
Appendix 3

Building Designs and Site Plans



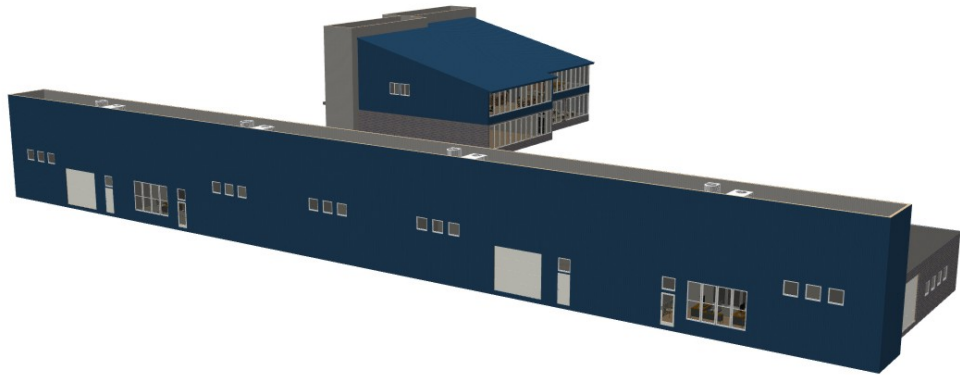
www.edoba-design.com

EDOBADESIGN



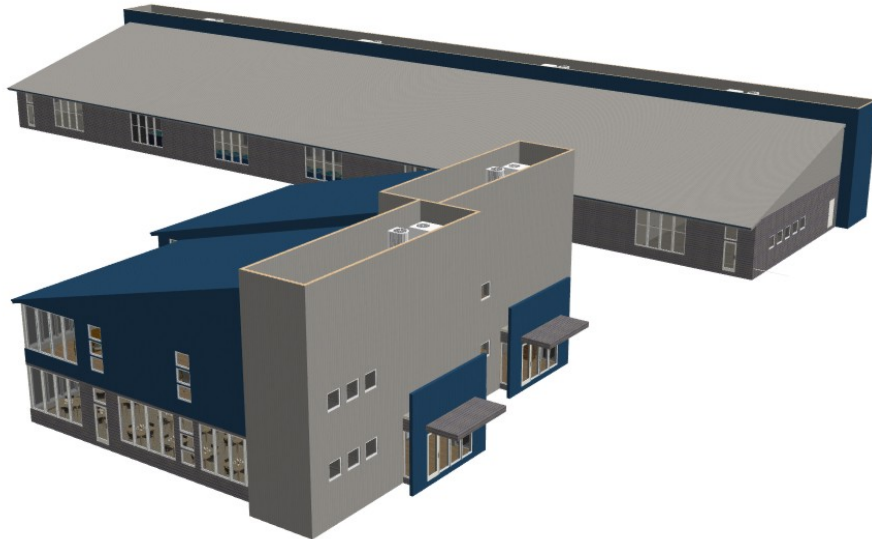
www.edoba-design.com

EDOBADESIGN



www.edoba-design.com

EDOBADESIGN



www.edoba-design.com

EDOBADESIGN

