Oregon
Theodore R. Kulongoski, Governor

Department of Transportation
Transportation Building
355 Capitol St. NE, Rm. 301
Salem, OR 97301-3871

FILE CODE:

DATE: May 28, 2008

TO: Robert W. Hadlow, Interim Environmental Manager, ODOT Region 1, Portland
Heather Gundersen, Environmental Manager, CRC Project, Vancouver
Rosalind Keeney, Parametrix, Corvallis
Michelle Eraut, FHWA—Oregon Division, Salem
Key No. 13136 File Type E

FROM: Cindy Orendorff, Geo-Environmental Section

SUBJECT: **Section 106 Documentation Form and**
Section 106 Finding of Effect on the Totem Pole Marina (Pier 99) Building
Interstate 5: Columbia River Crossing Project
Portland, Multnomah County, Oregon
ODOT Key No. 13136
Federal-Aid No. S000(0197)OTH

Attached is the signed DOE/FOE for the above referenced project.

Oregon
Theodore R. Kulongoski, Governor

Department of Transportation
Transportation Building
355 Capitol St. NE
Salem, Oregon 97301

FILE CODE:

April 17, 2008

Roger Roper
Assistant Director for Heritage Conservation
Deputy State Historic Preservation Officer
Oregon State Historic Preservation Office
725 Summer Street, Suite C
Salem, OR 97301

Attention: Sarah Jalving

SUBJECT: Section 106 Documentation Form and
Section 106 Finding of Effect on the Totem Pole Marina (Pier 99) Building
Interstate 5: Columbia River Crossing Project
Portland, Multnomah County, Oregon
ODOT Key No. 13136
Federal-Aid No. S000(0197)OTH

Dear Mr. Roper,

The enclosed Section 106 Documentation Form and Section 106 Finding of Effect on the Totem Pole Marina building are for your review and concurrence. The forms are submitted in compliance with the requirements of the National Historic Preservation Act of 1966, as amended. The Totem Pole Marina, also known as "Pier 99," is a boat sales showroom. It is a unique example of a mid-century modern thin-shell roof building featuring a wooden hyperbolic paraboloid roof. The Totem Pole Marina was constructed in the spirit of the Northwest Regional Style combing modern technology and design using wood. It is significant as the only known extant wooden hyperbolic-paraboloid roof building in Portland and perhaps Oregon. It is also significant for its association with architect John Storrs and engineer James G. Pierson. Storrs was one of Oregon's leading mid century architects and Pierson was one of Oregon's leading structural engineers. The Totem Pole Marina dates from 1960 and will be 50 years old or older when the proposed project would go to construction.

The Interstate 5 Columbia River Crossing Project (ODOT Key No. 13136, Federal-Aid No. S000(0197)OTH) is a bridge, transit and highway improvement project of the Oregon and Washington transportation departments. The project is charged with reducing congestion and improving safety problems on a five-mile segment of Interstate 5. The project area stretches from Washington State Route 500 in Vancouver, Washington, to approximately Columbia Boulevard in Portland, Oregon, including the Interstate Bridge across the Columbia River.

All build alternatives advanced for further consideration, whether they call for an upstream or downstream replacement bridge or supplemental spans for the existing bridge, would require an improved ramp from Marine Drive/Martin Luther King Jr. Boulevard to northbound Interstate 5. Its construction would remove the Totem Pole Marina building.

Based on a preliminary application of the Criteria of Adverse Effect (36 CFR 800.5), the Federal Highway Administration and the Oregon Department of Transportation believe that the proposed projects, together, will have an "adverse effect" on the Totem Pole Marina (Pier 99) building. We request your concurrence on the Documentation Form and the Finding of Effect.

My office will transmit to you separately the findings of effect for other resources in the Oregon portion of the Columbia River Crossing Project. Also, the Oregon Department of Transportation, the Washington State Department of Transportation, and the Federal Highway Administration's Washington and Oregon division offices will be developing a single memorandum of agreement to resolve the project's adverse effect impacts to historic and archaeological resources.

Your prompt attention to this coordination request is appreciated. If you have questions about the project, please contact Robert W. Hadlow, Ph.D., in Portland, at (503) 731-8239 or Michelle Eraut with the FHWA Oregon Division at (503) 587-4716.

Sincerely,

James B. Norman
Environmental Planning Unit Manager

Attachments:

Section 106 Documentation Form: Totem Pole Marina (Pier 99)
Section 106 Finding of Effect: Totem Pole Marina (Pier 99)

Copies with attachments:

Robert W. Hadlow, Interim Environmental Manager, ODOT Region 1, Portland
Heather Gundersen, Environmental Manager, CRC Project, Vancouver
Rosalind Keeney, Parametrix, Corvallis
Michelle Eraut, FHWA—Oregon Division, Salem
Key No. 13136 File Type E

OREGON INVENTORY OF HISTORIC PROPERTIES

SECTION 106 DOCUMENTATION FORM

Agency/Project: Oreg. Dept. of Transportation/Wash. State Dept. of Transportation, ODOT Key No. 13136, Fed.-Aid No. S000(0197)OTH	
Resource Name: Totem Pole Marina (Pier 99) Street Address:1441 N. Marine Drive	City, County: Portland, Multnomah
USGS Quad Name: Township: Range: Section: Tax Lot #:	District, Grouping or Ensemble? No Name:

Current Use: Boat sales room and wooden boat garage	Date of Construction: 1960
Architectural Classification/Resource Type: Mid Century Modern	Alterations & Dates: general maintenance
Window Type & Material: large plate glass with steel	Exterior Surface Materials: Primary: glass Secondary: wood Decorative:
Roof Type & Material: Hyperbolic Paraboloid, wood with built up roofing	
Condition: ☐ Excellent ☒ Good ☐ Fair ☐ Poor	Integrity: ☐ Excellent ☒ Good ☐ Fair ☐ Poor

View of the south west façade of the Totem Pole Marina (Pier 99) building, 1441 N. Marine Drive. Photo by Dan Wise November 2007

Preliminary National Register Findings:

☐ National Register listed Potentially Eligible: ☒ Individually ☐ As part of District

☐ Not Eligible: ☐ In current state ☐ Irretrievable integrity loss ☐ Lacks Distinction ☐ Not 50 Years

State Historic Preservation Office Comments:

☒ Concur ☐ Do Not Concur:

☐ Potentially Eligible Individually ☐ Potentially Eligible As part of District ☐ Not Eligible

Signed Sarah Jalving Date 5/14/2008

Comments:

Surveyor/Agency: Rosalind Keeney/Parametrix CRC Project – Date Recorded: 12/4/07 **106 Documentation Pg.** 1

OREGON INVENTORY OF HISTORIC PROPERTIES

SECTION 106 LEVEL OF EFFECT

Agency/Project: Oreg. Dept. of Trans./Wash. State Dept. of Trans., ODOT Key No. 13136, Fed.-Aid No. S000(0197)OTH	
Street Address: Totem Pole Marina, 1441 N. Marina Drive	City, County: Portland, Multnomah

Preliminary Finding of Effect:

☐ No Historic Properties Affected ☐ No Historic Properties Adversely Affected ☒ Historic Properties Adversely Affected

RECEIVED
MAY 16 2008
ODOT
GEO-ENVIRONMENTAL

State Historic Preservation Office Comments:

☒ Concur

☐ Do Not Concur:

☐ No Historic Properties Affected ☐ No Historic Properties Adversely Affected ☐ Historic Properties Adversely Affected

Signed Sarah Jahnig Date 5/14/2008

Comments:

Provide written description of the project, and its potential effects on the subject property per 36 CFR 800. Include maps, drawings, and photographs as necessary to effectively describe and discuss the project. Use continuation sheets as needed.

INTRODUCTION

This statement of finding discusses the effect of the proposed project on the Totem Pole Marina building (Pier 99) in Multnomah County, Oregon. This building was determined eligible for listing on the National Register in January 2008 by the Oregon State Historic Preservation Office.

It is the finding of the Federal Highway Administration (FHWA), in concurrence with the Oregon Department of Transportation (ODOT), that the proposed project will have an effect on the National Register eligible Totem Pole Marina Building and this effect is "adverse."

This statement of finding is made pursuant to the requirements of the National Historic Preservation Act of 1966 (36 CFR 800), Executive Order 11593, and the National Environmental Policy Act.

PROJECT DESCRIPTION

The Interstate 5 Columbia River Crossing Project, ODOT Key No. 13136, Federal-Aid No. S000(0197)OTH, is a bridge, transit and highway improvement project of the Oregon and Washington transportation departments. The project is charged with reducing congestion and improving safety problems on a five-mile segment of Interstate 5. The project area stretches from Washington State Route 500 in Vancouver, Washington, to approximately Columbia Boulevard in Portland, Oregon, including the Interstate Bridge across the Columbia River.

The purpose and need statement of the project, as described on the CRC website (http://www.columbiarivercrossing.org/) says that the proposed action will several address needs, including:

- **Growing Travel Demand and Congestion:** Existing travel demand exceeds capacity in the I-5 Columbia River Crossing and associated interchanges. This corridor experiences heavy congestion and delay lasting 2 to 5 hours during both the morning and afternoon peak travel periods and when traffic accidents, vehicle breakdowns, or bridge-lifts occur. Due to excess travel demand and congestion in the I-5 bridge corridor, many trips take the longer alternative I-205 route across the river. Spillover traffic from I-5 onto parallel arterials such as Martin Luther King Boulevard, and Interstate Avenue increases local congestion. The two crossings currently carry over 260,000 trips across the Columbia River daily. Daily traffic demand over the I-5 crossing project is projected to increase by 40 percent during the next 20 years. With stoop-and-go conditions increasing to at least 10 to 12 hours each day if no improvements are made.

- **Impaired freight movement**: I-5 is part of the National Truck Network, and the most important freight freeway on the West Coast linking international, national and regional markets in Canada, Mexico and the Pacific Rim with destinations throughout the western United States. In the center of the project area, I-5 intersects with the Columbia River's deep water shipping and

OREGON INVENTORY OF HISTORIC PROPERTIES

SECTION 106 DOCUMENTATION FORM

Agency/Project: WSDOT and ODOT I-5 Columbia River Crossing	
Resource Name: Totem Pole Marina (Pier 99 Marina) Street Address:1441 N. Marine Drive	City: Portland County : Multnomah
USGS Quad Name: Township: Range: Section: Tax Lot #:	District, Grouping or Ensemble? No Name:

Current Use: Boat sales room and wooden boat garage	Date of Construction: 1960
Architectural Classification/Resource Type: Mid Century Modern	Alterations & Dates: general maintenance
Window Type & Material: large plate glass with steel	Exterior Surface Materials: Primary: glass Secondary: wood Decorative:
Roof Type & Material: Hyperbolic Paraboloid, wood with built up roofing	
Condition: ☐ Excellent ☒ Good ☐ Fair ☐ Poor	Integrity: ☐ Excellent ☒ Good ☐ Fair ☐ Poor

View of the south west façade of the Pier 99 Marine building, 1441 N. Marine Drive. Photo by Dan Wise November 2007

Preliminary National Register Findings:

☐ National Register listed Potentially Eligible: ☒ Individually ☐ As part of District

☐ Not Eligible: ☐ In current state ☐ Irretrievable integrity loss ☐ Lacks Distinction ☐ Not 50 Years

State Historic Preservation Office Comments:

☐ Concur ☐ Do Not Concur:

☐ Potentially Eligible Individually ☐ Potentially Eligible As part of District ☐ Not Eligible

Signed _____ Date _____

Comments:

OREGON INVENTORY OF HISTORIC PROPERTIES
SECTION 106 DOCUMENTATION FORM

Resource Name: Totem Pole Marina (Pier 99) Street Address: 1441 N. Marine Drive	City: Portland - County: Multnomah
Architect, Builder or Designer (if known): John Storrs architect, James G. Pierson, engineer	Property Category: ☒ Building ☐ Structure ☐ District ☐ Site ☐ Object
Owner: ☒ Private ☐ Local Government ☐ State ☐ Federal ☐ Other Name: Walter Valenta Address: 909 N. Tomahawk Is. Dr. #104 City, State, Zip: Portland Oregon 97211 Phone: 503 285-2644	

Description of Property (including exterior alterations & approximate dates), Significance Statement, and Sources. (Use continuation sheets if necessary.):

Physical Description

The Totem Pole Marina (Pier 99) building was designed by architect John Storrs and associate architect Simon Stanich, and structural engineer James G. Pierson in 1960 as a boat sales and show room. It was constructed by George A. Moore and Associates. It is a two story north facing glass, steel and wood building featuring eight unique double curved, wooden hyperbolic paraboloid shells to form a roof that covers 7, 200 sq. ft. of area. The marina's roof was constructed of eight parabolic shells, 30 x 30 ft., arranged in a rectangular manner. Each shell consists of two skins of 1 x 4 Douglas stretched under tension, with the direction of one skin diagonal to that of the other. The hyperbolic parabolioid roof allowed for an unobstructed showroom to display large boats and cruisers and the design emphasized the nautical character of the business and as an advertising eye-catcher (Pacific Architect and Builder, 1961). The building is 110 feet long and 55 feet wide with a 7-foot walkway extending around the main floor on the east, south and west sides. The main entrance is on the Oregon Slough side (levee side) and is used as the main pedestrian entrance and boat access area (refer to the floor plan in Figure 1.). The ground floor is 110 feet long and 36-feet wide and abuts and is built on the Oregon Slough Levee on the north side of the building. The ground floor has large sliding doors facing south and the parking lot along Marine Drive. The ground level space is finished on only aproximately one half of the width of the upper showroom level. The sliding doors at the ground level are used to access the area which is currently used as a boat garage/maintenance area. The building is 25 feet high; ground floor 14 feet high.

John Storr's drawings for the Totem Pole Marina are held at the U of O Special Collections Library, SCA Manus Collection 108, in folder #12. The catalog lists 11 sheets in the folder however, there are only 10 that relate to the Marina building. They consist of and are numbered (1) plot plan (2) foundation plan (3) floor plans (4) cross sections and elevations (5) bearing shoes and tie rods for hyperbolic paraboloid roof shells (E1) electrical (E2) electrical w/ plumbing (R1) exterior window plan (no #) early blueprint of plan w/notes in red ink (no #) early blueprint of foundation w/notes in red ink. The drawings (except the two blueprints) are in pencil and were drawn by "SGS," except for sheet 5, which was prepared (and stamped) by Engineer James G. Pierson. Copies of the drawings are not available at this time however, a review of the drawings indicate the following:

The south elevation (which faces the river) is symmetrical with a centered, overhead lift door (originally an inward swinging double door) that is seven feet in total width. It is flanked by four panes of fixed glass followed by a 3'-6" inward swinging door, with an additional three panes of glass at the outside edge. The east elevation consists of nine panes of glass. The south half of the west elevation has four panes of glass, with the northern half covered in vertical, rough cedar siding (1x6"). The north elevation features a recessed center section consisting of a 10' centered double-door opening flanked by four panes of glass on either side. The projecting east and west ends of the north elevation each feature four panes of glass. The glass of the south, east and west sides is specified as "Crystal Gray," while that on the north is "Crystal Clear." It is not known whether "Crystal Gray" indicates an opaque glass or merely one with some sort of solar reflective coating.

Originally the interior of the show room level was open with the exception of a freestanding bathroom block near the northwest corner near an outside wall sheathed in wood siding. An enclosed office was added to the interior at a later unknown date. The projecting northwest corner is also now an office space.

The flooring material on the interior is specified as 4x6" tight, tongue and groove, hemlock decking with no additional flooring on top. The exterior decking that runs around the perimeter of the building is 2x4" pressure treated (wolmanized) lumber

placed on edge. An open metal railing is located around the exterior deck on the east, south, and west (the drawings indicated a cyclone railing that was merely a suggested railing type), with a low, 13" high bench-like railing on the north.

The ceiling/roof structure consists of two-layers of 1x4" tongue-and-groove laid perpendicular to each other and topped with built-up roofing. It features 8 hyperbolic paraboloids. The finished thickness of the roof diaphragm appears to be only about 2 inches deep.

The building foundation is a concrete wall that runs east-west at about the middle of the building. The plot plan implies that boats were supposed to be wheeled out from this point and transported via a new road around the west half of the building to a marine rail.

The building is primarily as-built with the exception of some replacement plate glass windows, aluminum siding on the west and south ground level walls, diagonal support brackets under the 7-foot exterior walkway, redesigned north showroom lift garage doors, and the framed interior office space.

The original name "Totem Pole" most likely refers to the building's essential structural elements: The centered 10"x10" pole, with 6"x6" members at the buildings corners and 8"x8" members at the sides.

Statement of Significance

The Totem Pole Marina building is a unique example of a mid century modern thin-shell roof building featuring a wooden hyperbolic paraboloid roof. It was constructed in the spirit of the Northwest Regional Style combing modern technology and design using wood. It is significant as the only known extant wooden hyperbolic-paraboloid roof building in Portland and perhaps Oregon. It is also significant for its association with architect John Storrs and engineer James G. Pierson. Storrs was one of Oregon's leading mid century architects and Pierson was one of Oregon's leading structural engineers.

According to the Marian Webster Dictionary a hyperbolic paraboloid is defined as a saddle-shaped quadric surface. The *Journal of On-line Mathematics* says that the name stems from the fact that their vertical cross sections are parabolas, while the horizontal cross sections are more complicated than with an elliptic paraboloid. The elliptic paraboloid is shaped like an oval cup and can have a maximum minimum point. The hyperbolic paraboloid is shaped like a saddle and can have a critical point called a saddle point. It is a doubly ruled surface (Cherry, 1983). A visual example of a hyperbolic paraboloid is similar to the shape of a "Pringels" potato chip contained in a can.

It was most commonly constructed of reinforced concrete, because of concrete's inherent strength in compression and is a type of thin-shelled structure. Thin-shelled structures are light weight and typically curved and assembled to large structures. They were used because they generally are less expensive to construct in terms of materials and because they can cover a very large area without internal floor plan obstructions. A thin-shell is defined as a shell with a thickness which is relatively small compared to its other dimensions and in which deformations are not large compared to thickness. Somewhat similar in design to a folded plate structure, a primary difference between a shell structure and a folded plate structure is that, in the unstressed state, the shell structure has curvature as opposed to plates structures which are flat. Membrane action in a shell is primarily caused in in-plane forces, though there may be secondary forces resulting from flexural deformations. Where a flat plate acts similar to a beam with bending and shear stress, shells are analogous to a cable which resists load through tensile stress (Chen, 1997).

The Totem Pole Marina was the second building featuring a wooden hyperbolic paraboloid roof designed by architects Storrs and Simon Stanich and engineer Pierson, with George A. Moore and Associates as the general contractor. One year earlier on a 165-acre site near the 11-acre Pacific International Exposition Building (now the Multnomah County Exposition Center) west of I-5, across from the Totem Pole Marina site, Storrs and Pierson designed the Forest Products Pavilion for Oregon's 1959 Centennial Exposition in Portland. The Centennial Expo was the major activity as part of the statewide celebration of Oregon's 100 years of Statehood. According to George McMath in the "Wood Traditions Expands" chapter of Space Style and Structure, "The most dramatic structure was the Lumber Pavilion (Forest Products Pavilion); the soaring structure consisted of seven hyperbolic paraboloids, each 50 feet square, with linear skylights at the intersections. The seven paraboloids were supported at six buttresses. Four buttress took the trust from two paraboloids; the other two took the trust from three parabolids. The low point of the paraboloids started at the top of the buttress, which was eight feet off the floor. Tie rods connected the opposing buttresses were six inches below the finished concrete slab floor. The finished thickness of the roof diaphragm was only 1 ½ inches. The paraboloids, then a fashionable form usually designed in concrete, were built of laminated 1" x 6" fir lumber. When built it was described as, "unlike any building in the world," (Western Conservation Journal, 1959). The 24,000 sq. ft. structure was designed to show new uses for wood in architecture. In the 1962 Columbus Day Storm the roof was blown off by the strong winds and the building was demolished. The actual failure mechanism was a shearing off of the steel connection bolds form the low corners of the shell to the concrete piers. The Totem Pole Marina

(Pier 99) was similar in the basic design of the Forest Products Building but the marina was designed with a central support column with perimetric tie rods instead of concrete buttress supports to the floor.

John Storrs (1920-2003) is considered one of the primary proponents of the Northwest Regional Style architecture in Oregon (along with Pietro Belluschi, John Yeon, Van Evea Baily, Saul Zaik, Donald J. Steward and K. E. Richardson to name some of the best known architects practicing in Oregon). Raised in the Northeast and trained at Yale, he moved to Portland in 1950 and established a practice. It was said that while in school he had heard Pietro Belluschi (originally an Oregon architect) give a lecture on regional architecture and was impressed by his views on regionalism and decided to move to Oregon. Storrs' designs showed a concern and sensitivity for the setting and often used simple but strong roof forms and bold expression of wood structures. Based on his architectural drawings, held at the U of O, it is know that he designed many Portland residences, as well as commercial buildings, churches, schools and specialty buildings. Some of his more notable buildings include the Portland Garden Club (1956), Salishan Lodge (1965) and the Western Forestry Center at the Portland Zoo complex (1971).

Simon Stanich (1920 – 1996) worked with Storrs for a short time then worked with Dick Norman and on his own primarily designing residential buildings but also some churches including the Catholic Church in the Laurelhurst Neighborhood in Portland.

Born in 1910 and educated at Oregon Agricultural College (now Oregon State University), James G. Pierson began his career with the Army Corps of Engineers as a civil/structural engineer. In 1945 he formed a partnership with Bob Tidball, a mechanical engineer and the two of them began specializing in structural engineering. He had worked on wood design projects and had contracts with the wood industry and provided much of the design work for Multnomah Plywood and Ross Island Sand and Gravel among other industry clients. It is not know when he started working with Storrs but the first big project appears to have been the Forest Products Pavilion which was designed in 1958. He worked on several projects with John Storrs from the late 50s until his death in 1968. After he died his son Steve and Jerry Estoup worked with Storrs on other buildings including St. Mary's Church in Corvallis, Lakeridge High School in Lake Oswego, Catlin Gable School buildings in Portland (1968), the Western Forestry Center at the zoo (1971), and Salishan Dining Room Addition (1969). Pierson wrote the Hyperbolic Paraboloid Shells chapter in the 1958 Douglas Fir Use Book (see figure 84 from book below), for the West Coast Lumbermen's Association which describes how to design a doubly curved, hyperbolic-paraboloid roof structure of lumber. Pierson used a drawing of a hyperbolic paraboloid as the Pierson company logo.

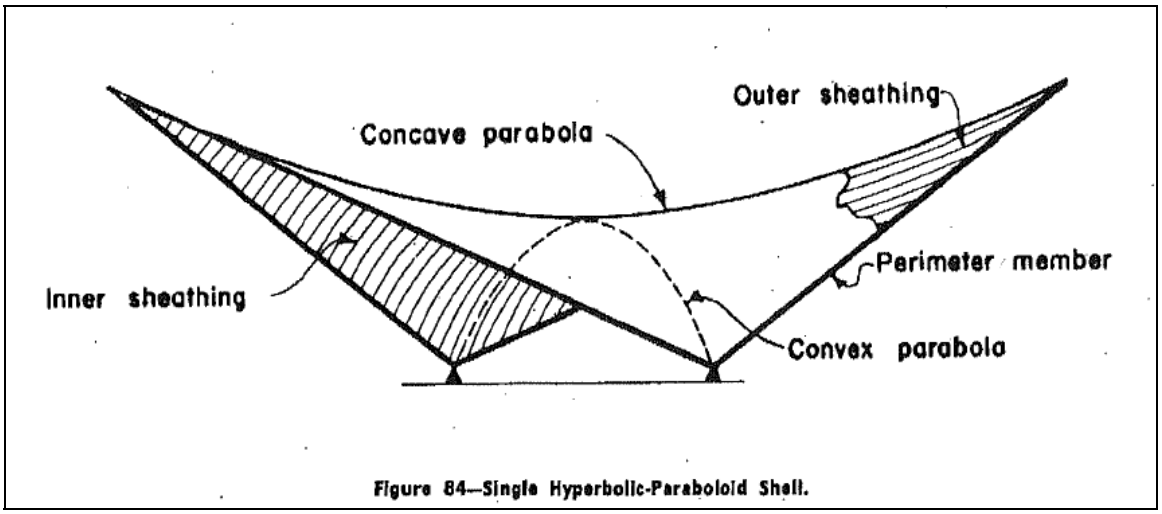


Figure 84—Single Hyperbolic-Paraboloid Shell.

In discussing the rarity of wooden hyperbolic paraboloid roof buildings, Jerry Estoup, current owner and principle engineer at James G. Pierson Engineering, reflected that wooden hyperbolic paraboloid roofs may have lost their following after the early 1960s because the flexibility and lightweight nature and low cost of materials of the hyperbolic paraboloid roofs was easier to use and less expensive using plywood. Interestingly, according to the Encyclopedia of Architectural Technology, plywood, although probably invented in ancient Egypt, and improved in Europe and America in the 19th century, had one of the earliest applications of mass-produced modern plywood manufacturing in the United States in Portland, Oregon by the Portland Manufacturing Company for the Lewis and Clark Exposition for the Forestry Building in 1905. The owner, Thomas J. Autzen helped develop a bonding technology, which greatly shortened the drying and manufacturing process. His early engineering contribution played an important role in making plywood one of the most abundant and affordable building products ever produced.

National Register Criteria

Based on preliminary evaluation using the Criteria established for eligibility for the National Register of Historic Places the Totem Pole Marina appears to meet the following criteria and should be considered eligible for the NRHP for its significance in architecture and engineering as a building that possesses integrity of location, design, setting, material workmanship, feeling and association:

(b) that is associated with the lives of John Storrs and James Pierson, two significant proponents and practitioners of the Northwest Region Style of the in our past; and

(c) that embodies distinctive characteristics of a rare wooden hyperbolic paraboloid roof Mid Century Modern Northwest Regional Style building.

The 1960 building is not considered under Criterion g) a property achieving significance within the past 50 years if it is of exceptional importance because it will be 50 years old by the time the I-5 Columbia River Crossing project is anticipated to be started.

References

American Heritage Dictionary of the English Language, Fourth Edition, 2007, Houghton Mifflin Company. http://www.bartleby.com/61/.

Chen, Wai-Fah, 1997 Handbook of Structural Engineering, CRC Press.

Cherry, Bridget and Nikolous Pevsner, 2002. London 2: South: The Buildings of England (Pevsner Architectural Guides). Yale University Press.

Guedes Pedro editor, 1979. Encyclopedia of Architectural Technology McGraw-Hill Book Company, Reference International Publishes Limited, London England.

O'Halloran, M.R. 1989. Plywood. In *Concise Encyclopedia of Wood and Wood-based Materials,* ed. Arno Schniewind. Oxford: Pergamon. p. 221-226.

Journal of on line Mathematics, 2005. "Interactive Gallery of Quadric Surfaces". Jonathan Rogness http://www.math.umn.edu/~rogness/quadrics/hypparab.shtml

Marion Webster on line dictionary, January, 2008, http://www.m-w.com/dictionary/hyperbolic%20paraboloid.

Pacific Architect and Building Magazine, 1961.

Plywood Pioneers Associate, March 1967. Plywood in Retrospect, Portland Manufacturing Company No. 1, Tacoma WA. http://www.apawood.org/plywoodpioneers/pdfs/PPA_01.pdf

Schniewind, Arnold, ed. 1989, Concise Encyclopedia of Wood and Wood-based Materials, Plywood chapter, O'Halloran, M. R. Oxford.

West Cost Lumberman's Association , Douglas Fir Use Book, Structural Data and Design Tables, Portland Oregon

Western Conservation Journal, May-June 1959. "At Oregon's Centennial, Dramatic Wood Pavilion Steals the Show and Winds Wide Acclaim".

Vaughan, Thomas Editor, Virginia Guest Ferriday, Associate Editor. 1974, Space, Style and Structure, Buildings in the Northwest America, Volume two, Oregon Historical Society, Portland, Oregon.

Interview with owner Walter Valenta on site, November 2007.

Interview (Phone) with Jerry Estoup, principle, James G. Pierson Engineering, December 4, 2007.

Interview (Phone) with Steve Pierson January 25, 2008.

Interview (Phone) with Marian Stanich, March 13, 2008.

Email correspondence with Jerry Estoup, January 18, 2008.

Totem Pole Marina

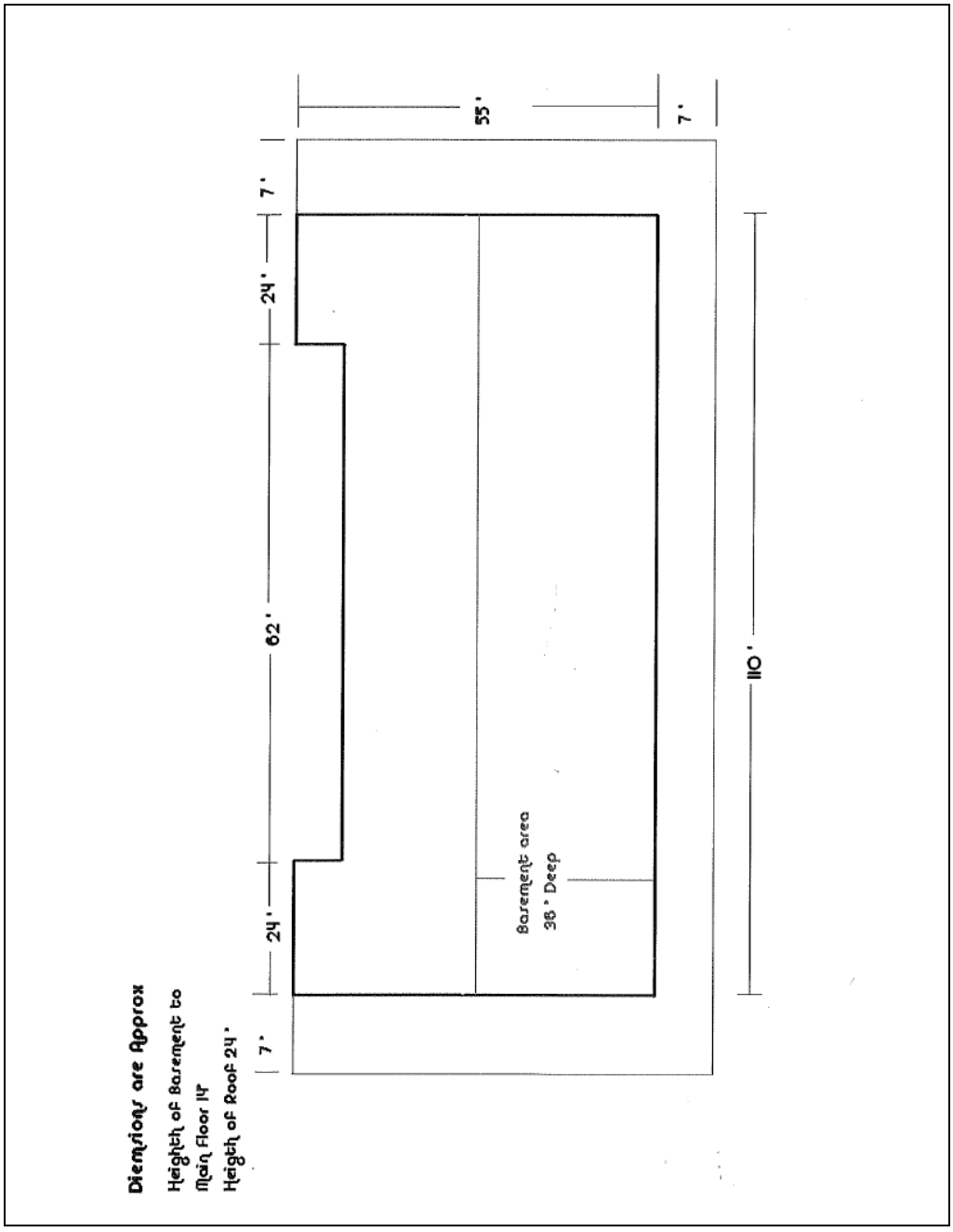


Figure 1. View: Floor Plan of Totem Pole Marina Drawn by Cliff Denning

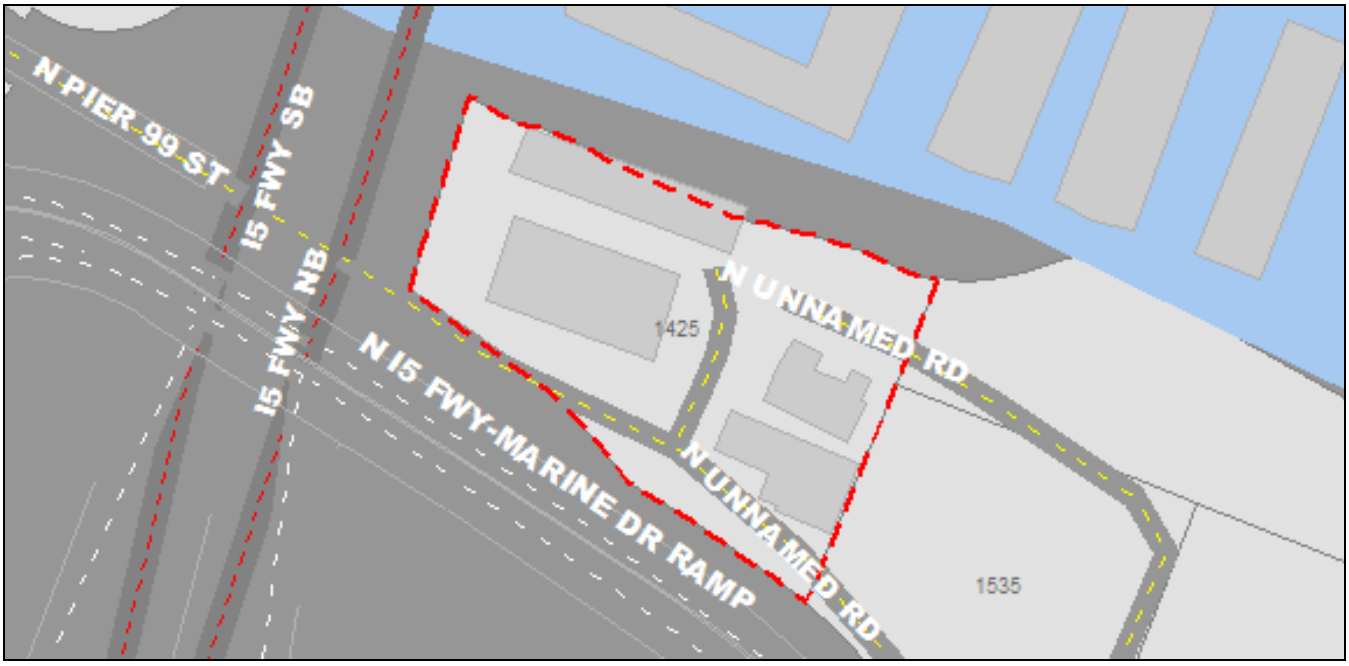


Figure 2. View: Location of Totem Pole Marine tax lot 1425, source: Portland tax files

Figure 3. View: Looking north from Marine Drive, note I 5 overpass on the left side.

Figure 4. Looking west from the drive way on the east side of the building going toward the river.

Figure 5. Looking south west from the river side entry.

Figure 6. Looking south from the river slough side entry.

Figure 7. Looking at the south west corner of the building. Sign is on I-5 side.
Note stairs and wooden siding on the northwest corner.

Figure 8. Interior view of showroom. Note support pole on left side of photo.

Figure 9. Interior view of showroom. Note hyperbolic paraboloid arches of the ceiling.

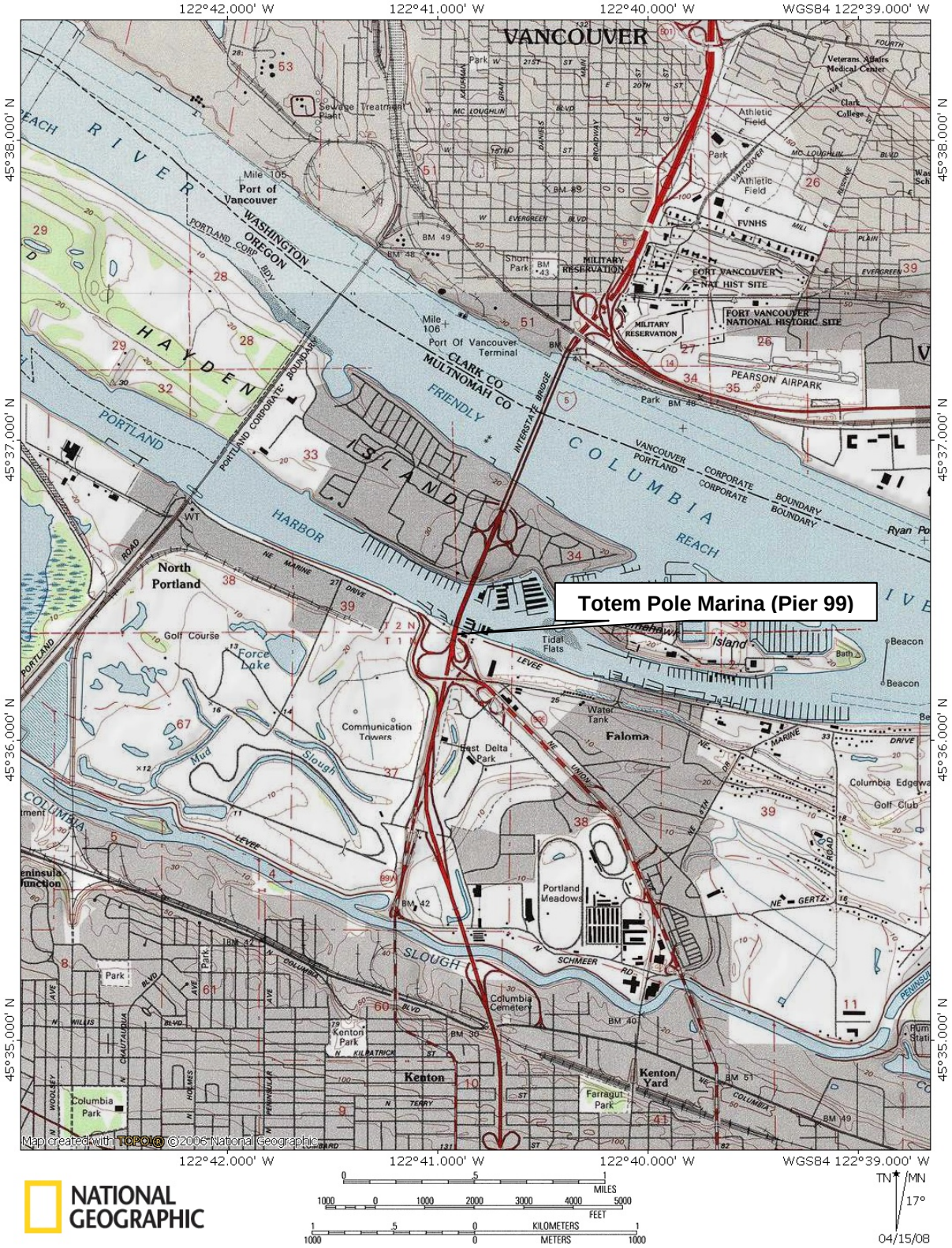
Figure 10. Pier 99 sign.

Figure 11. Looking at the east façade and front of the building from the west side of the Pier 99 tax lot. The slough is on the left side of the photograph and the ramp and boats are on the Columbia Slough levee.

Figure 12. Photograph of the 1958 Forestry Pavilion designed by John Storrs and James G. Pierson
Source: Jerry Estoup at James G. Pierson Inc. Structural Engineers.

Agency/Project: Oreg. Dept. of Transportation/Wash. State Dept. of Transportation, ODOT Key No. 13136, Fed.-Aid No. S000(0197)OTH	
Street Address: Totem Pole Marina, 1441 N. Marina Drive	City, County: Portland, Multnomah

Interstate 5: Columbia River Crossing Project, Totem Pole Marina (Pier 99), ODOT Key No. 13136



OREGON INVENTORY OF HISTORIC PROPERTIES

SECTION 106 LEVEL OF EFFECT

Agency/Project: Oreg. Dept. of Trans./Wash. State Dept. of Trans., ODOT Key No. 13136, Fed.-Aid No. S000(0197)OTH	
Street Address: Totem Pole Marina, 1441 N. Marina Drive	City, County: Portland, Multnomah

Preliminary Finding of Effect:

☐ No Historic Properties Affected ☐ No Historic Properties Adversely Affected ☒ Historic Properties Adversely Affected

State Historic Preservation Office Comments:

☐ Concur

☐ Do Not Concur:

☐ No Historic Properties Affected ☐ No Historic Properties Adversely Affected ☐ Historic Properties Adversely Affected

Signed _____ Date _____

Comments:

Provide written description of the project, and its potential effects on the subject property per 36 CFR 800. Include maps, drawings, and photographs as necessary to effectively describe and discuss the project. Use continuation sheets as needed.

INTRODUCTION

This statement of finding discusses the effect of the proposed project on the Totem Pole Marina building (Pier 99) in Multnomah County, Oregon. This building was determined eligible for listing on the National Register in January 2008 by the Oregon State Historic Preservation Office.

It is the finding of the Federal Highway Administration (FHWA), in concurrence with the Oregon Department of Transportation (ODOT), that the proposed project will have an effect on the National Register eligible Totem Pole Marina Building and this effect is "adverse."

This statement of finding is made pursuant to the requirements of the National Historic Preservation Act of 1966 (36 CFR 800), Executive Order 11593, and the National Environmental Policy Act.

PROJECT DESCRIPTION

The Interstate 5 Columbia River Crossing Project, ODOT Key No. 13136, Federal-Aid No. S000(0197)OTH, is a bridge, transit and highway improvement project of the Oregon and Washington transportation departments. The project is charged with reducing congestion and improving safety problems on a five-mile segment of Interstate 5. The project area stretches from Washington State Route 500 in Vancouver, Washington, to approximately Columbia Boulevard in Portland, Oregon, including the Interstate Bridge across the Columbia River.

The purpose and need statement of the project, as described on the CRC website (http://www.columbiarivercrossing.org/) says that the proposed action will several address needs, including:

- **Growing Travel Demand and Congestion:** Existing travel demand exceeds capacity in the I-5 Columbia River Crossing and associated interchanges. This corridor experiences heavy congestion and delay lasting 2 to 5 hours during both the morning and afternoon peak travel periods and when traffic accidents, vehicle breakdowns, or bridge-lifts occur. Due to excess travel demand and congestion in the I-5 bridge corridor, many trips take the longer alternative I-205 route across the river. Spillover traffic from I-5 onto parallel arterials such as Martin Luther King Boulevard, and Interstate Avenue increases local congestion. The two crossings currently carry over 260,000 trips across the Columbia River daily. Daily traffic demand over the I-5 crossing project is projected to increase by 40 percent during the next 20 years. With stoop-and-go conditions increasing to at least 10 to 12 hours each day if no improvements are made.

- **Impaired freight movement**: I-5 is part of the National Truck Network, and the most important freight freeway on the West Coast linking international, national and regional markets in Canada, Mexico and the Pacific Rim with destinations throughout the western United States. In the center of the project area, I-5 intersects with the Columbia River's deep water shipping and

Agency/Project: Oreg. Dept. of Trans./Wash. State Dept. of Trans., ODOT Key No. 13136, Fed.-Aid No. S000(0197)OTH	
Street Address: Totem Pole Marina, 1441 N. Marina Drive	City, County: Portland, Multnomah

barging as well as two river-level, transcontinental rail lines. The I-5 crossing provides direct and important highway connection to the Port of Vancouver and Port of Portland facilities located on the Columbia River as well as the majority of the area's freight consolidation facilities and distribution terminals. Freight volumes moved by truck to and from the area are projected to more than double over the next 25 years. Vehicle-hours of delay on truck routes in the Portland-Vancouver area are projected to increase by more than 90 percent over the next 20 years. Growing demand and congestion will result in increasingly, costs and uncertainty for all business that rely on the corridor for freight movement.

- **Limited public transportation operation, connectivity and reliability:** Due to limited public transportation options, a number of transportation markets are not well served. The key transit markets include trips between the Portland Central City and the City of Vancouver and Clark County, trips between North/Northeast Portland and the City of Vancouver and Clark County, and trips connecting the City of Vancouver and Clark County with the regional transit system in Oregon. Current congestion in the corridor adversely impacts public transportation service reliability and travel speed. Southbound bus travel times across the bridge are currently up to three times longer during parts of the am peak compared to off peak. Travel times for public transit using general purpose lanes on I-5 in the bridge influence are expected to increase substantially by 2030.

- **Safety and Vulnerability to Incidents**: The I-5 river crossing and its approach-sections experience crash rates nearly 2.5 times higher than statewide averages for comparable facilities. Incident evaluations generally attribute these crashes to traffic congestion and weaving movements associated with closely spaced interchanges. Without breakdown lanes or shoulders, even minor traffic accidents or stalls cause severe delay or more serious accidents.

- **Substandard bicycle land pedestrian facilities**: The bike/pedestrian lanes on the I-5 Columbia River bridge are 6 to 8 feet wide. Narrower than he 10-foot standard, and are located extremely close to traffic lanes thus impacting safety for pedestrians and bicyclists. Direct pedestrian and bicycle connectivity are poor in the BIA.

- **Seismic vulnerability**: the existing I-5 bridges are located in a seismically active zone. They do not meet current seismic standards and are vulnerable to failure in and earthquake.

IDENTIFICATION AND DESCRIPTION OF THE HISTORIC RESOURCE

The Totem Pole Marina (Pier 99) building was designed by John Storrs and James G. Pierson and constructed by George A. Moore in 1960 as a boat sales and showroom. It is a two-story north facing glass, steel and wood building. The Totem Pole Marina building is a unique example of a mid-century modern building featuring a wooden thin-shell hyperbolic paraboloid roof. It was designed in the spirit of the Northwest Regional Style combing modern technology and design using wood. It is significant as the only known extant wooden hyperbolic-paraboloid roof building in Portland and perhaps Oregon. It is also significant for its association to architect John Storrs and engineer James G. Pierson, two of Oregon's leading mid century building and structural designers.

AVOIDANCE ALTERNATIVES CONSIDERED

Because the Totem Pole Marina building has been determined to be eligible for the National Register by the Oregon State Historic Preservation Office, project alternatives were considered to eliminate or minimize the predicted project impacts on this historic resource. The CRC project analyzed many options to relieve the problems identified in the purpose and need, but rejected many of them because they did not address the project's goals as identified in the Purpose and Need statement. These included the following:

- **Third highway river crossing:** between 68 and 75 percent of trips crossing the Interstate Bridge in peak travel hours have origins or destinations within the project area itself. Even if a new bridge is constructed east or west of I-5, most trips would not be diverted to that new bridge. In addition, a third river crossing would not address the safety deficiencies on the Interstate Bridge or the highway leading to it. The SW Washington Regional Transportation Council (RTC) is studying the future need for a third crossing outside the I-5 corridor.

- **Tunnel:** It would be difficult to match the existing roadway grades on either side of the river with a tunnel. As a result, a tunnel would bypass at least three interchanges in the project area: Vancouver City Center, SR 14 and Hayden Island. A tunnel would require creating an intricate system of arterials east and west of the tunnel for vehicles to access the portals in and out

Agency/Project: Oreg. Dept. of Trans./Wash. State Dept. of Trans., ODOT Key No. 13136, Fed.-Aid No. S000(0197)OTH	
Street Address: Totem Pole Marina, 1441 N. Marina Drive	City, County: Portland, Multnomah

of the structure. This system would have more water quality, right of way, archaeological and historic resource impacts than the alternatives under consideration.

- **Arterial bridge:** Even with an additional arterial crossing for travel between Vancouver, Hayden Island, and Marine Drive, I-5 would continue operating over-capacity, with the new arterial bridge carrying only 13-18 percent of river crossing trips. An arterial bridge would carry both local and regional trips. Traffic congestion in downtown Vancouver would increase by about 60 percent as drivers back up on local streets trying to bypass I-5 across the Columbia River.

- **Upstream bridge:** CRC removed the upstream bridge alignment from additional active study because of its significant impacts to Fort Vancouver and its lengthier construction time compared to the other bridge alternatives. The upstream bridge alignment will be discussed in the Draft Environmental Impact Statement.

- ***TRANSIT*** *solutions evaluated include:*
- **Commuter rail:** CRC ruled out commuter rail on the Burlington Northern-Santa Fe tracks because the system does not have the capacity to operate both existing freight rail and more frequent passenger service. A second option, building new commuter railway tracks within the BNSF right of way, has significant environmental and cost impacts. Commuter trains would be slowed by priority BNSF freight trains, which would not improve transit performance in the project area. The project also considered a new railway corridor, but it requires massive financial resources and bi-state cooperation. A new railway corridor also would have significant right of way impacts.

- **Ferry:** A ferry service would be slower than other transit modes and would not improve congestion.

- **Streetcar:** This slower type of transit service cannot serve the region's existing or future population and would not improve congestion if constructed to serve the Vancouver to Portland commuter market.

- ***HIGHWAY*** *solutions evaluated include:*
- Reversible lanes: Reversible lanes, like those on I-5 in Seattle, require added shoulders and barriers compared to regular highways. This increased width could have greater impacts on right of way in downtown Vancouver. Reversible lanes also perform better as part of a larger, regional system; they would not relieve congestion significantly in CRC's five-mile project area.

- **I-205 capacity improvements:** Between 68 and 75 percent of traffic on the I-5 bridge enters or exits the freeway within the project area, which does not include the I-205 corridor. To address congestion and safety deficiencies, improvements must be made to I-5 itself.

No-Build Alternative: Although this alternative would have no effect on the Totem Pole Marina building, it would not correct congestion, improve freight movement, serve markets well, increase safety, improve the roadway improve safety for pedestrians and bicyclist or address seismic vulnerability of the bridges. This alternative was determined to be not prudent.

EVALUATION OF EFFECTS

The improvement that impacts the Pier 99 building is the Marine Drive/Martin Luther King Boulevard ramp to I-5 northbound. This is regardless of whether the alternative is upstream or downstream, replacement or supplemental. Refer to figures 6 and 7.

With all the alternatives considered, one of the goals was to match into the existing interstate infrastructure as quickly as possible. At the south end, this occurs between Marine Drive and Victory Boulevard. As a result the mainline horizontal alignment at the North Portland Harbor crossing is very close to the existing alignment. It is at this crossing where the horizontal alignment begins to diverge from the existing alignment. As a result any widening or added improvements cause impacts to the immediately adjacent properties on either side of the freeway and in this case to the Pier 99 building on the east side of the highway.

To avoid the building the alternatives would be to either a) push the alignment of the ramp farther to the east or b) try to squeeze the ramp improvements in between the existing building and the proposed mainline freeway improvements. In either case while the alternatives would avoid the building, they would still impact the property and marina facilities on the Harbor.

Agency/Project: Oreg. Dept. of Trans./Wash. State Dept. of Trans., ODOT Key No. 13136, Fed.-Aid No. S000(0197)OTH	
Street Address: Totem Pole Marina, 1441 N. Marina Drive	City, County: Portland, Multnomah

If the first avoidance alternative were pursued, it would likely result in additional property displacements on the north side of the Harbor and essentially land lock the property, with interstate facilities on either side. Access could still probably be accommodated to the east but would be limited horizontally by the pier placements and vertically by the height of the ramp structure.

If the second avoidance alternative were pursued there would be design and geometry impacts to consider. The result would create a tighter radius and lower design speed on the Marine Drive connection. The staging could become more complex, lengthening the construction period and/or requiring additional construction phases. The adjustment would also require an increase in the height of the ramp structure.

The project will require acquiring the parcel and removing the building. According to the Criteria of Adverse Effect set forth in Section 106 of the National Historic Preservation Act, the project will have an adverse effect" on the potentially eligible Totem Pole Marina (Pier 99) building.

COORDINATION AND PUBLIC NOTIFICATION

The project consultant team coordinated with the Washington Department of Archaeology and Historic Preservation, the Oregon State Historic Preservation Office, Native American tribal governments, WSDOT, ODOT, local planners and municipal historic preservation specialists, historical commissions and societies, private interest groups, and other involved or interested agencies. All formal consultations with tribal governments were channeled through FHWA, acting through its WSDOT and ODOT agents. Coordination included, but was not limited to, the interactions described below.

The CRC internal cultural resources group included DOT archaeologists and historic built environment specialists, CRC environmental project management staff, and cultural resources consultants who met bi-weekly to discuss status, approaches, issues, and provide guidance.

The Historic Resources Technical Advisory Group included members of the CRC cultural resources group and representatives from the City of Vancouver, City of Portland, FHWA cultural specialists, National Parks Service (NPS) historic resource specialists, and Section 106 historic resources specialist from DAHP and SHPO. This group met three times.

The Cultural Resources/Section 4(f) Work Group (CWG) included parties with regulatory interests in project-area historic, archaeological, cultural, and other Section 4(f) resources. This group met on an as-needed basis, as determined appropriate by WSDOT and ODOT historic resources, archaeological/cultural resources, and Section 4(f) specialists.

The CRC identified Consulting Parties pursuant to requirements and guidelines in 36 CFR 800.

The project consultant team and WSDOT management coordinated with ODOT and WSDOT (as agents of FHWA and FTA), DAHP, SHPO, and other Consulting Parties to define the appropriate APE for the project. Comments were received and considered.

The project team coordinated with DAHP and SHPO to solicit concurrence on NRHP eligibility for evaluated historic properties.

The project consultant team solicited input from local jurisdictions on potential historic resources found to be ineligible for NRHP listing by DAHP or SHPO, but potentially subject to local historic resources protection provisions.
The project team solicited concurrence from DAHP and SHPO on level of effect for properties formally determined to be eligible for the NRHP.

The project team solicited input from local jurisdictions on whether any historic resource found to have local historic significance but not meeting NRHP eligibility criteria would be adversely affected by the project, considering local impact assessment criteria.

Meetings were held, beginning in 2005, with representatives from federal and state regulatory agencies to provide input on this project. Agencies included the City of Portland, ODOT, WSDOT, the City of Vancouver, Community Planning; National Parks Service (NPS); Vancouver Historic Reserve Trust and Fort Vancouver Historic Site; Washington DAHP and Oregon SHPO. Native American Tribes with resource interests relevant to this project, including: Chinook, Confederated Tribes of Grand Ronde, Confederated Tribes of the Umatilla Indian Reservation, Confederated Tribes of Warm Springs, Cowlitz Indian Tribe, Nez Perce Tribe, Siletz Tribe, Spokane Tribe and the Yakama Nation, also provided input and guidance during several meetings. These meetings are summarized below:

- Biweekly Cultural Resources Technical Group meetings with WSDOT, ODOT, FHWA, and CRC team.

Agency/Project: Oreg. Dept. of Trans./Wash. State Dept. of Trans., ODOT Key No. 13136, Fed.-Aid No. S000(0197)OTH	
Street Address: Totem Pole Marina, 1441 N. Marina Drive	City, County: Portland, Multnomah

- Feb. 15, 2006: Cultural Resources/Section 4(f) Workgroup Resources Meeting. Invitees: WSDOT, ODOT, Cowlitz, Tri Met, NPS, C Tran, FHWA, Grande Ronde, OR SHPO, City of Vancouver, FTA, Metro, DAHP, City of Portland.
- March 20, 2007: The Columbia River Crossing History Seminar, Vancouver, WA., presentations from representatives of the Chinook, Cowlitz, Grande Ronde, Nez Perce, Yakama, Siletz, Spokane, Umatilla, and Warm Springs Tribes, as well as a presentation of Settlement History in the project area by local scholars.

During the course of proposed project development, project management staff met several times with the NPS cultural resources and management staff of the Fort Vancouver National Historic Site and VNHR to exchange information about the proposed project and its potential effects on historic resources associated with the Reserve.

The Washington DAHP, Oregon SHPO, Native American Tribal governments, WSDOT, and ODOT have reviewed the draft historic resources report, which discusses project effects. A draft environmental impact statement (DEIS) will be out for review in February 2008 for the public review and comment.

CONCLUSION

It is the determination of the FHWA FTA, and ODOT that the proposed project has an effect on the National Register eligible Totem Pole Marina (Pier 99) building, and the effect is “adverse” according to the criteria set forth in 36 CFR 800.5.

Agency/Project: Oreg. Dept. of Trans./Wash. State Dept. of Trans., ODOT Key No. 13136, Fed.-Aid No. S000(0197)OTH	
Street Address: Totem Pole Marina, 1441 N. Marina Drive	City, County: Portland, Multnomah

Figure 1: Looking south east at the north and west facades of the Totem Pole Marina building.

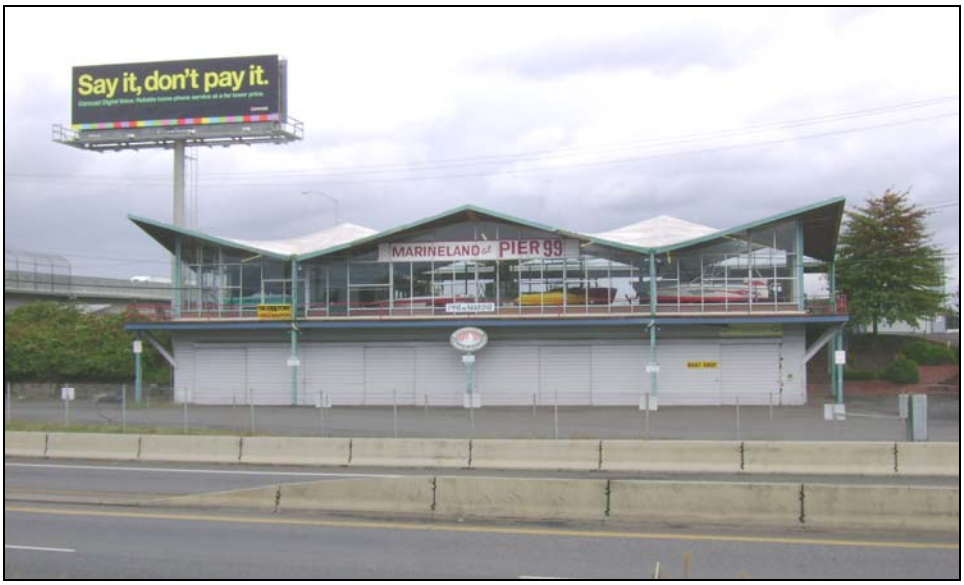


Figure 2: Looking at the south façade of the Totem Pole Marina from N. Marine Drive.

Agency/Project: Oreg. Dept. of Trans./Wash. State Dept. of Trans., ODOT Key No. 13136, Fed.-Aid No. S000(0197)OTH	
Street Address: Totem Pole Marina, 1441 N. Marina Drive	City, County: Portland, Multnomah

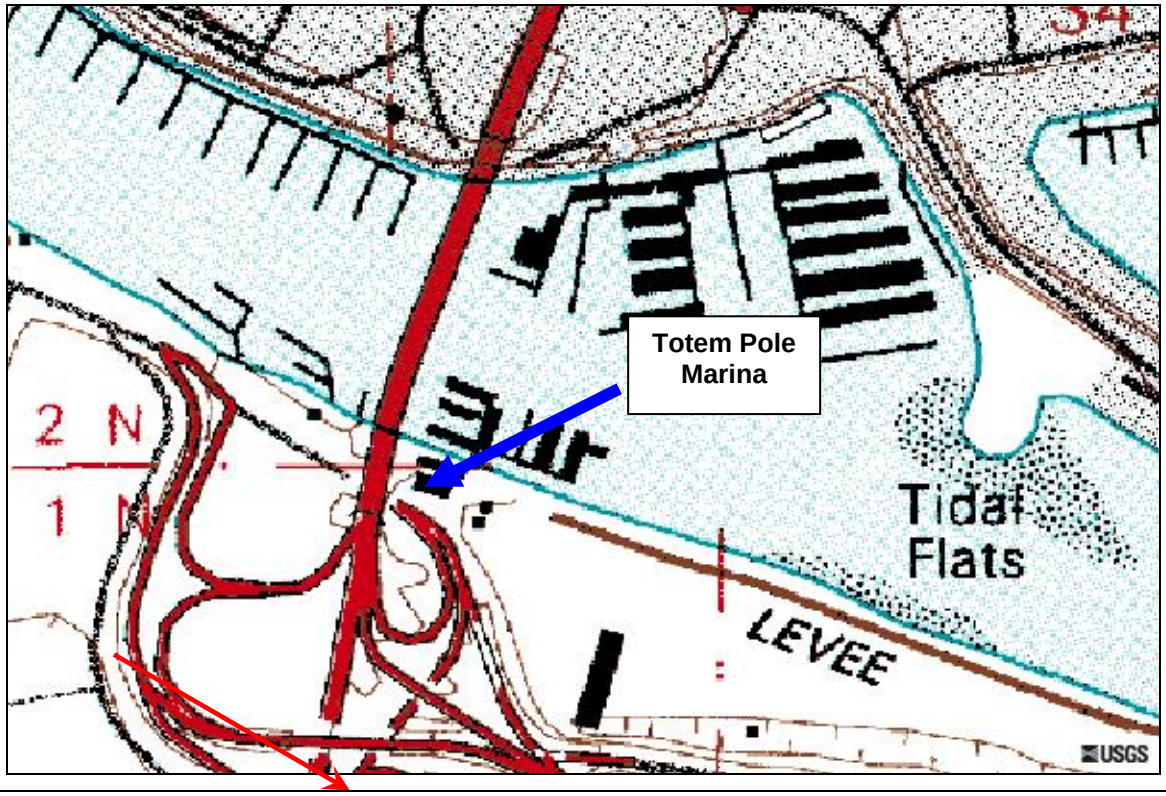


Figure 3: Location Map: 1441 N. Marine Drive

USGS http://terraserver-usa.com/usgsentry.aspx?T=1&S=11&Z=10&X=1312&Y=12625&W=1&qs=1441+N.+Marine+Dr%7cPortland%7coregon

Image courtesy of the U.S. Geological Survey

Figure 4: Google earth map showing location of Totem Pole Marina at 1441 N. Marine Drive, Portland Oregon.

Agency/Project: Oreg. Dept. of Trans./Wash. State Dept. of Trans., ODOT Key No. 13136, Fed.-Aid No. S000(0197)OTH	
Street Address: Totem Pole Marina, 1441 N. Marina Drive	City, County: Portland, Multnomah

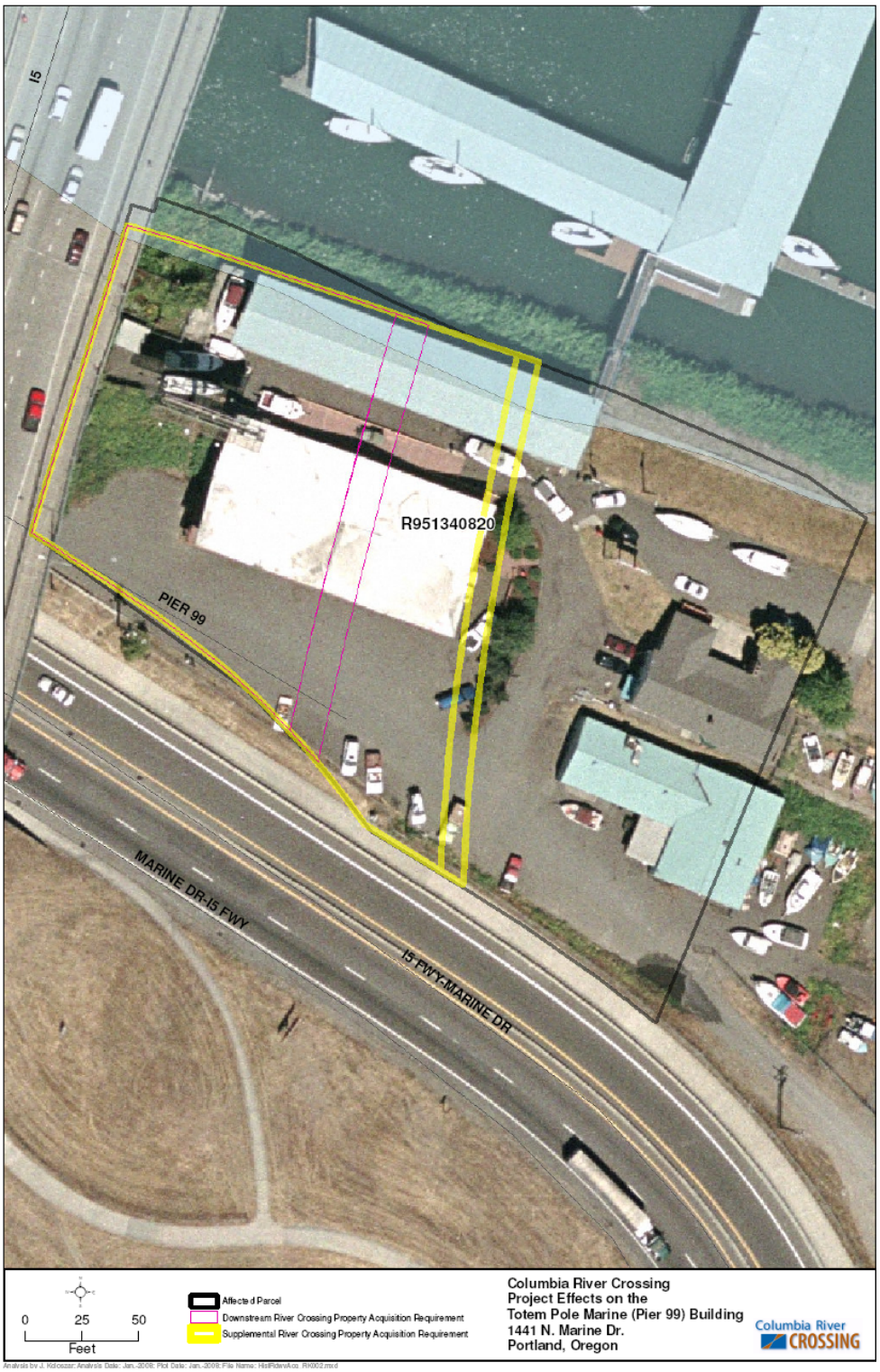


Figure 5: Location of Totem Pole Marina and Property Acquisition Requirement.

Agency/Project: Oreg. Dept. of Trans./Wash. State Dept. of Trans., ODOT Key No. 13136, Fed.-Aid No. S000(0197)OTH	
Street Address: Totem Pole Marina, 1441 N. Marina Drive	City, County: Portland, Multnomah

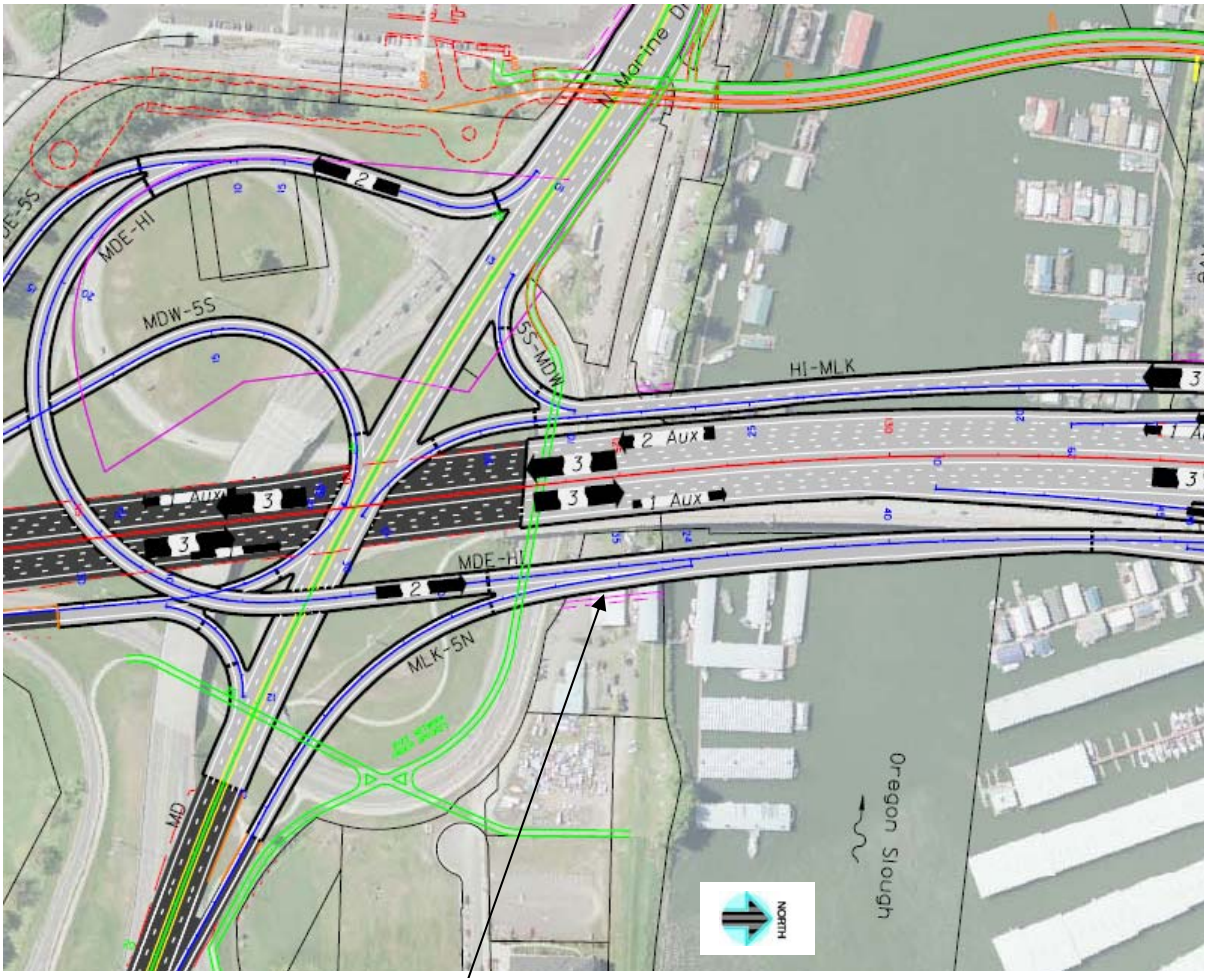


Figure 6: Pier 99 Building. Replacement Option.

Agency/Project: Oreg. Dept. of Trans./Wash. State Dept. of Trans., ODOT Key No. 13136, Fed.-Aid No. S000(0197)OTH	
Street Address: Totem Pole Marina, 1441 N. Marina Drive	City, County: Portland, Multnomah

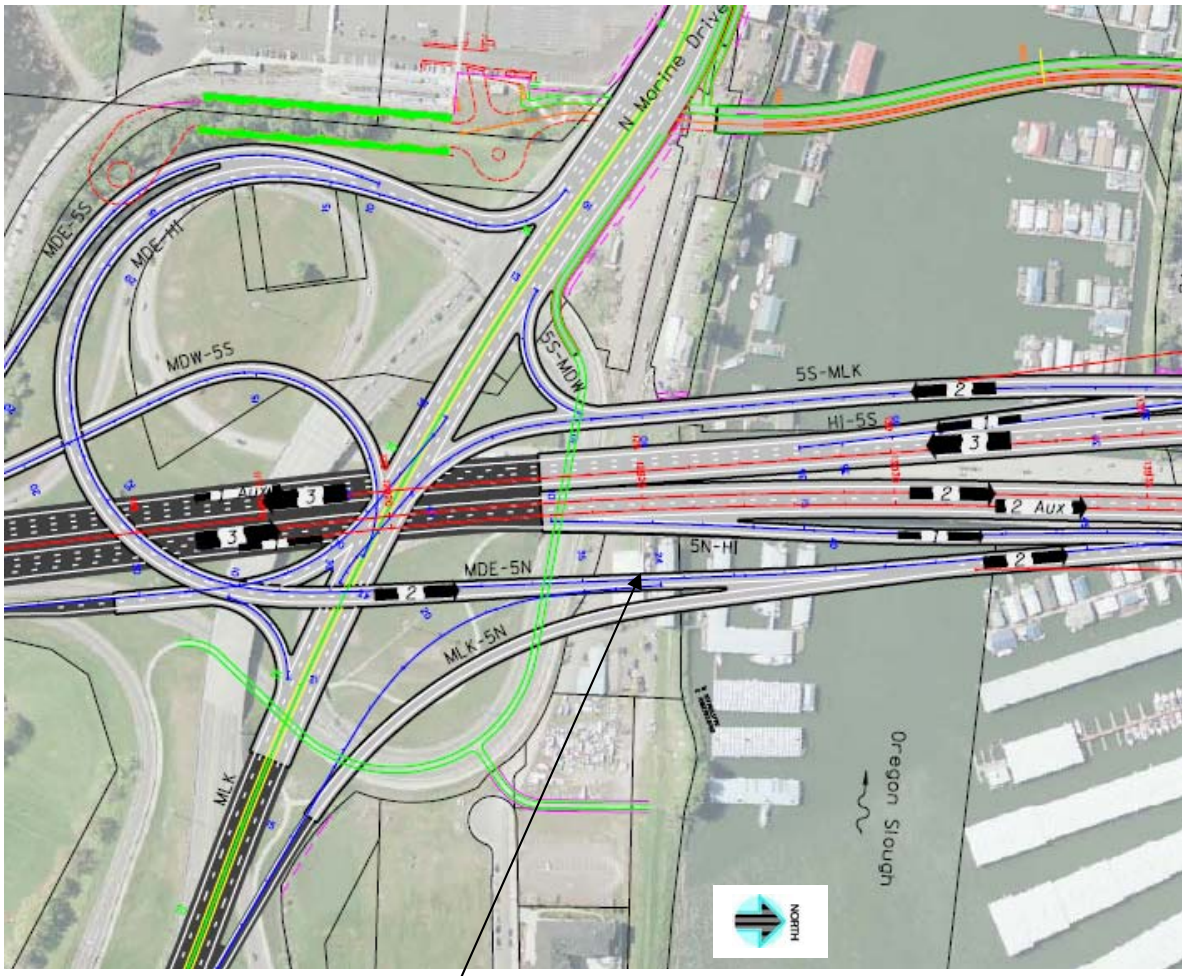


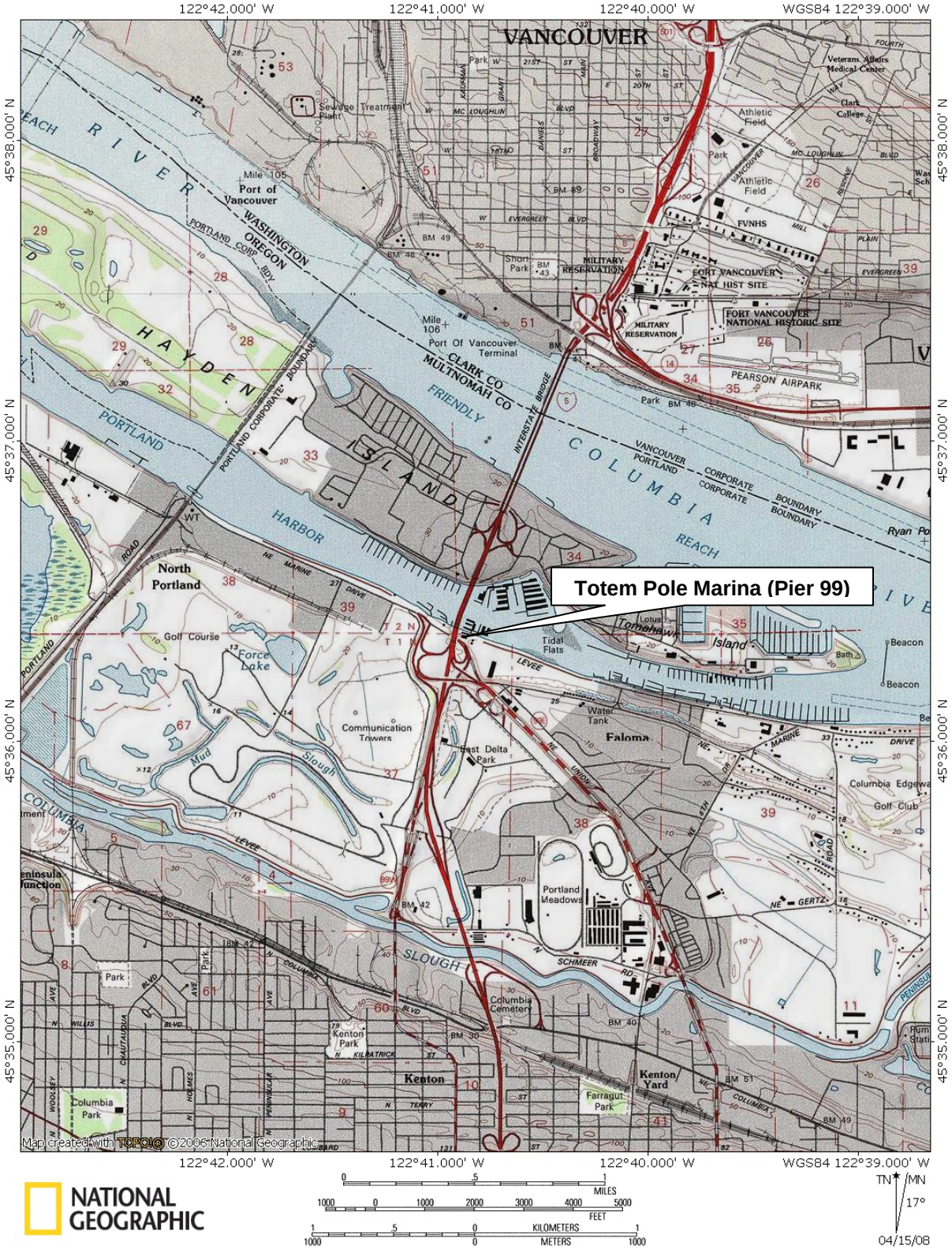
Figure 7: Pier 99 Building. Supplemental Option.

OREGON INVENTORY OF HISTORIC PROPERTIES

SECTION 106 LEVEL OF EFFECT

Agency/Project: Oreg. Dept. of Trans./Wash. State Dept. of Trans., ODOT Key No. 13136, Fed.-Aid No. S000(0197)OTH	
Street Address: Totem Pole Marina, 1441 N. Marina Drive	City, County: Portland, Multnomah

Interstate 5: Columbia River Crossing Project, Totem Pole Marina (Pier 99), ODOT Key No. 13136



Surveyor/Agency: Rosalind Keeney/Parametrix Cultural Resources Date Recorded: January 2008 **106 Effect Pg 11**