

FROM: Columbia River Estuary Study Taskforce  
TO: Heather Hansen, Clatsop County  
CC: Denise Lofman and April Silva, CREST  
DATE: September 12, 2016  
SUBJECT: Pile supported construction as a form of wetland low impact development

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### **Introduction**

This memo examines pile supported construction in wetlands as a technique for limiting impacts to wetlands when no upland building area is available. No scientific or technical information was discovered specifically explaining the ecological functions that are protected by constructing on piles instead of on fill within wetlands. Consultation with wetland specialists at Washington Department of Ecology indicates that the benefits of pile supported construction would be minimal in terms of ecological functions protected. Considering Oregon's wetland fill laws, pile supported construction could be used in some circumstances to avoid state permitting and mitigation requirements that would otherwise be required for fill supported construction.

### **Wetland functions conserved by pile supported construction**

No scientific or technical information was discovered specifically explaining the ecological functions that are protected by constructing on piles instead of on fill within wetlands. Logically, pile supported construction would leave wetland acreage as wetland, conserve surface water capacity under the structure, and allow surface and groundwater to move freely below the structure, whereas fill supported construction would eliminate these functions.

### **Wetland functions not conserved by pile supported construction**

Consultation with Washington Department of Ecology (Ecology)<sup>1</sup> wetland specialists indicated that there are not scientific studies comparing pile supported construction to fill supported construction impacts to wetland functions. Ecology's extensive guidance<sup>2</sup> on how avoid, minimize, and mitigate development impacts to wetlands mostly answers questions about how far away activities must be from a wetland in order to protect the wetland's ecological functions. Their recommended buffers vary from 25 ft. for the lowest quality wetlands to 300 ft. for high quality wetlands, with recommended buffers of 100 to 200 ft. for most wetlands.

Ecology's wetland specialist indicated that a pile supported structure would impact wetlands in several ways, and that when all impacts from the construction and resulting development are taken together, the question of fill supported vs. pile supported might be moot. Impacts from a pile supported structure would be:

- impact hydrology by placing a large impervious surface in the wetland and potentially non-pile supported driving and parking areas, thereby altering flow regimes within the wetland.
- Impact water quality by introducing a pollutant source into the wetlands, and removing/shading out the plants that could remove or clean the pollutants.
- Impact habitat by eliminating habitat in the development footprint, and introducing a source of noise, light, and other pollution to the wetland.

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<sup>1</sup> Rebecca Rothwell, Department of Ecology. Email correspondence.

<sup>2</sup> [Wetlands in Washington - Volume 2: Guidance for Protecting and Managing Wetlands](#) (April 2005, Publication #05-06-008)

- Further impact to all three function categories in the act of construction, when wetland soils could be disturbed and compacted, site vegetation would be removed or damaged, and additional pollutants would be introduced to the site.

### **Effect of pile supported construction on mitigation requirements**

In wetlands that are not regulated by the Army Corps of Engineers, and not designated Essential Salmon Habitat or a State Scenic Waterway by DSL, fills of less than 50 cubic yards would not be subject to state and federal permits. Thus in many situations, pile supported construction that that would otherwise require 50 cubic yards of fill would avoid state and federal permit and mitigation requirements. In this regard, allowing or requiring pile supported construction could conserve some minimal wetland functions, but still cause most of the impacts associated with fill, while freeing the applicant of compensatory mitigation requirements.

### **Comparison of pile supported and fill supported construction**

Cannon Beach City Planner Mark Barnes indicated that the difference between pile and fill supported construction is minimal, at least when considered within the overall development costs for typical residential construction in Cannon Beach.

### **Proportionality of permit/mitigation costs and extra costs associated with piles**

If the pile vs. fill construction cost difference is true and applicable to the planning areas of interest in Clatsop County, then the permit/mitigation cost savings associated with pile supported construction would be vary mostly based on whether or not DSL/USACE permits are required. Where DSL or USACE permits are required, we would expect permit and mitigation costs to be similar regardless of construction method, because pile supported structures do not conserve most ecological functions. Where USACE permits are not required, and pile supported construction helps an applicant avoid the need for DSL permit, pile supported construction would preclude DSL regulation/mitigation costs. These concepts could be considered in much more detail, to determine whether those permit/mitigation costs are a substantial portion of overall development costs in Arch Cape.

### **Other considerations for pile supported construction as a form of LID in wetlands**

Pile supported construction should be accompanied by specific standards for how construction activities are performed, in order to achieve the purported benefits of minimizing hydrologic impacts and impact area footprint. There are ways in which construction activities and home maintenance and use activities for a pile supported development could impact wetland functions even more than they would on a fill supported site. For example, machines and foot traffic could proliferate beyond areas they would otherwise, and toxic materials could contact wetlands and disburse in wetland waters more quickly than they might if they were on fill.

Cannon Beach's zoning code provides a point of discussion for allowing pile supported structures in wetlands. In Cannon Beach, residences in wetlands are not allowed on fill. Pile construction is required. Building footprints are limited to 2,500 square ft. A stormwater plan is required, though there don't appear to be special wetland related standards for discharge rate or water quality. Driveways and parking can be fill supported. Construction activities must minimize wetland impact, and steps must be taken to avoid the release of toxic substances, although there are no specific standards or procedures to follow to ensure this is achieved.

**Conclusion**

The ecological function benefits of pile supported construction are limited, and in order to be achieved should be accompanied by building footprint maximums, and construction activity standards and procedures that help ensure the potential benefits are precluded by damage during the construction process. In some situations, pile supported construction could free an applicant from mitigation obligations, despite their being similar impacts to fill supported construction. The most effective wetland impact avoidance and minimization comes in the form of developing outside of wetlands and establishing protective buffers between the development and the wetland. Subdivision/partition processes that ensure buildable land outside of wetlands, and that treat adjacent wetland lots in common ownership as a single lot would be important elements of a wetland protection program.