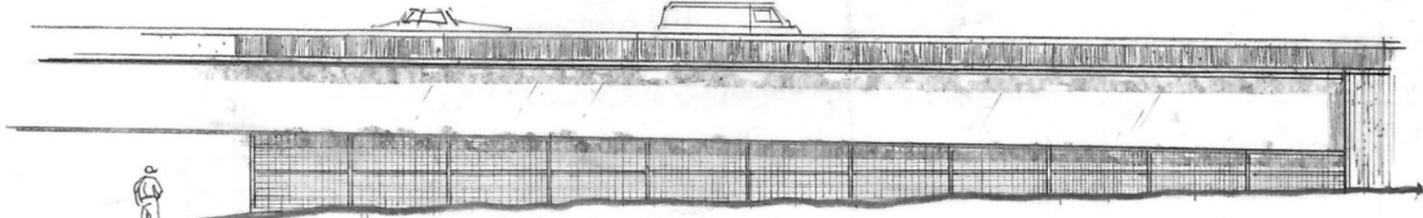
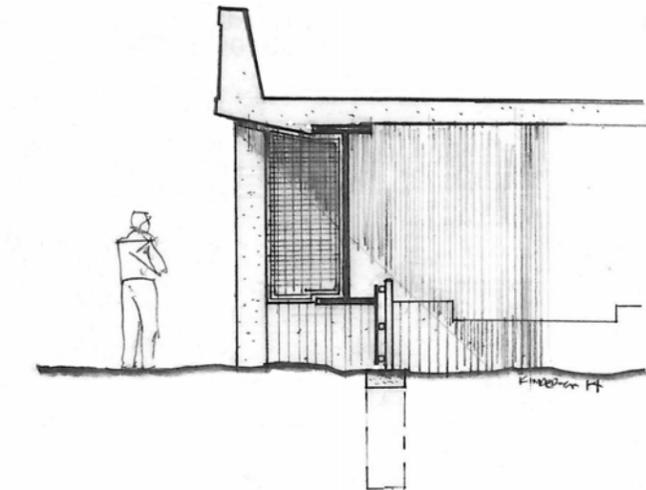


High-Security Fencing - A Retrofit Solution Whose Time Has Come

Several possibilities exist to discourage the formation of encampments. Some, as explained on the previous page, are effective if incorporated into the original bridge design. Once a bridge is built, however, high-mesh security fencing installed retroactively can be an effective deterrent to setting up encampments.



The two illustrations on this page, drawn by WSDOT Bridge and Structures Architect Paul Kinderman, illustrate the use of high-security fencing to block access to enticing encampment areas directly under the bridge deck resulting from traditional bridge designs. Security fences must be carefully designed to satisfy competing interests. The department's commitment to Context Sensitive Design requires that fencing be not only effective, but that it does not detract from the general aesthetics or economic viability of an area.



The above photo shows high-security fencing successfully deterring encampments in Northwest Region. Olympic Region hopes to install such fencing through the I-5/SR 16 interchange where new Nalley Valley bridges provide tempting locations for encampments.

Not just any fencing is effective. The wire mesh must be strong and tight. Several brands of security fencing are available.

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Washington State
 Department of Transportation

Homeless Encampments and Security Fencing

July 2014



Homeless encampments present significant challenges to WSDOT crews. Clean-up efforts require added resources, attention to potential health hazards, and often, law enforcement escorts into the area.

Beyond the Call of Duty

Over the last 10 years, Olympic Region maintenance crews have seen an increase in the number of homeless encampments on WSDOT property, particularly along the highway corridors near Tacoma, Puyallup and Olympia. The encampments are located in shrubbery, under bridges and in other areas away from public view. The encampments are often cluttered with drug paraphernalia, stolen items, human waste, rotting garbage and other dangerous or toxic items.

These encampments and their occupants present a significant challenge to WSDOT's maintenance, signal and bridge crews as they try to perform their day-to-day duties. The sites continually expose crews to a population of chronic trespassers. Although sympathetic to the occupants' situations, WSDOT crews are untrained to deal with the issues these occupants present, including potential mental health issues, stolen state property, health hazards and threats.



Areas under bridge girders become attractive homes for encampments.



This camper dug a hole in the fill to access under this bridge deck.

Issue at a glance

an Olympic Region perspective

- Encampment removals occur on average three times annually at each occupied location.
- The average clean-up cost for one removal, including labor, equipment and materials, is \$1,600.
- In 2006, WSDOT maintenance crews in Tacoma spent \$80,000 to repeatedly clean a problematic area (I-5/I-705 interchange), following business complaints, and another \$30,000 on bridge fencing that occupiers damaged, vandalized and stole.
- Olympic Region recently built three new Nalley Valley bridges that present tempting encampment sites.
- Six more tempting bridge sites will be built in the I-5: M Street to Portland Avenue - HOV project.
- The estimated cost of keeping just these nine new locations encampment-free is \$43,000 annually without additional security steps.

Status Quo is Inadequate

As the number of trespassing encampments has increased, so has Olympic Region's response to the problem. Maintenance crews are focusing more time, more resources, and more money to remove encampment sites. They are also partnering with jurisdictions and agencies to jointly tackle the problem, using Department of Corrections inmate crews to help clean sites, and coordinating escorted visits to the sites with law enforcement (especially the City of Tacoma Police and Washington State Patrol) to ensure the safety of WSDOT crews. More resources have also been spent in making areas less attractive for would-be trespassers, including removing expensive roadside shrubbery and trees to increase visibility, and installing chain-link fencing under low-clearance bridge abutments in conjunction with CPTED (Crime Prevention Through Environmental Design) practices.

Costs are Real

Despite Olympic Region's efforts, the problem continues to grow. Fencing has been cut and/or stolen. Trespassers vacate sites long enough for clean-up work to occur, then immediately move back in. City of Tacoma clean-up crews, in the past offering this service free of charge, now charge to clean encampment sites on WSDOT property. Department of Corrections has reduced the number of sites they will allow inmates to clean, and only after Department of Corrections' site inspectors clear each individual site for their participation. As WSDOT's funds become more restricted, site cleanups no longer occur on a routine basis and often only occur after WSDOT receives numerous complaints.

The encampments also affect the state bridge inspection program. State bridge inspectors are required to inspect all bridges at least once every two years. The homeless encampments and accompanying hazards can make it impossible for bridge inspectors to perform close, hands-on inspections of bridge abutments and bearings. WSDOT's Bridge Preservation Office has asked



This map shows locations of some homeless encampments in the city of Tacoma. In 2014, the City identified over 80 encampments, over half of which were on WSDOT property. Previously, the city provided clean-up services gratis. It now charges for clean-up services on WSDOT property.

“WSDOT can’t solve this problem independently. That will take a coalition of local governments, social services, civic groups and volunteers. We do, however, need to do what we can to protect the state’s infrastructure.”

Troy Cowan
Olympic Region Assistant
Regional Administrator -
Maintenance & Operations



Trespassers cut through this chain-link fence shortly after it was installed. In other areas, fencing has been stolen. It was a good idea, however materials were inadequate.

that Olympic Region maintenance crews remove transient camps at eight bridges in Pierce County to allow for complete bridge inspections. Campfires set by trespassers have also caused damage to several bridges in the Tacoma area.

Proactive Design

The best solution for deterring homeless encampments is to prevent them from forming in the first place. That goal may not be possible everywhere, but a good place to start is preventing encampments from forming under bridges. The effectiveness of a proactive design approach can be seen in the two photos at right. The top right photo shows a traditional bridge design that includes a tempting “shelf” for campers to inhabit.

The bottom right photo shows a bridge designed to eliminate that shelf. This solution to encampments is effective if incorporated into the original bridge design. Once the bridge is built, it is not feasible to retrofit to this configuration.



Panhandlers at intersections often look for places to find shelter nearby. Signs like this one help discourage panhandling.

Another design modification is to slope the ground directly away from the bridge abutment, thus again eliminating the “shelf.” This bridge is the underside of a ramp leading from I-5 to the WSDOT Headquarters in Olympia. As seen in this photo, even this approach is only moderately successful in deterring encampments.



Common bridge designs as seen above provide ample opportunity for encampments to form. The occupier has used plastic tarps to create an intimidating barrier to those involved in clean-up efforts.

The below photo shows a bridge designed to remove the tempting “shelf” often used by campers. If incorporated into the design phase, this approach is an effective deterrent. Long-term cost savings of preventing encampments far outweigh slightly-increased design and construction costs.

