



## Nomination Form

"Partnership for Environmental Excellence in Construction Management"  
Award

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Project Name: I-405, NE 195<sup>th</sup> St. to SR 527 Northbound Auxiliary Lane (I-405 Bothell) \_\_\_\_\_

Contractor Name: Kiewit Infrastructure West Co. \_\_\_\_\_

Project Engineer: Chad Brown (PE), Omar Jepperson (Assistant PE) \_\_\_\_\_

Date Project Accepted: September 30<sup>th</sup>, 2010 (Date of Physical Completion) \_\_\_\_\_

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Category of Award (*please underline one category*):

Eastern Washington

Western Washington

Kiewit Infrastructure West Co.  
Brad Halvorson, Project Manager

Washington State Department of Transportation  
Chad Brown, Project Engineer

### **Brief Project Description**

The \$19.2 million I-405, NE 195<sup>th</sup> St. to SR 527 Northbound Auxiliary Lane (I-405 Bothell) Design Build project was awarded in September 2009, and constructed in nine months with its primary goal of improving safety and mobility on the northbound I-405 corridor between 195<sup>th</sup> St. and SR 527. This project was funded through the American Recovery Reinvestment Act (ARRA), and was centered on an aggressive schedule to swiftly add an average of 22 feet of lane width to serve as a new auxiliary lane and shoulder on northbound I-405. The auxiliary lane enhanced traffic flow by increasing capacity, reducing congestion, and decreasing congestion-related traffic collisions.

### **Collaborative Partnerships**

**The partnership between Kiewit Infrastructure West Co. (Kiewit), and WSDOT staff** began by co-locating all parties on the I-405 Bothell project in one convenient jobsite office. Team building activities including barbeques and social events cultivated a work environment built upon open communication. Additionally, WSDOT personnel participated in Kiewit's 'play-of-the-day' meetings, where the schedule, environmental concerns, and safety hazards were identified and analyzed. Weekly Environmental Task Force meetings brought project stakeholders together to discuss environmentally-focused topics such as BMP strategies, stormwater monitoring data and project inspections. Participants of the weekly Environmental Task Force meetings consisted of the project-specific environmental engineer and project manager from Kiewit, WSDOT representatives, and environmental consultants AMEC Earth & Environmental, Inc. Field inspections concluded Environmental Task Force meetings (See Figure 1), where participants gathered in the field to discuss current project status as well as step-by-step instructions for implementing environmental compliance strategies for upcoming work.

Before mass excavation and earthwork construction began, WSDOT, Kiewit, and their environmental consultant AMEC **invited the Department of Ecology (DOE) to conduct a pre-construction field inspection and review the project Environmental Compliance Plan (See Figure 4)**. Here, DOE expressed their primary concern was providing enough capacity for stormwater retention. To eliminate this concern Kiewit provided ample stormwater storage by excavating a temporary 800,000 gallon settling pond (See Figure 6), installing three 22,000 gallon Baker tanks, and obtaining a sanitary sewer discharge permit.

Prior to construction Kiewit attended City of Bothell council meetings to discuss project plans and construction-related impacts with the public. **Local community members indicated two primary concerns** about the project; 1) preserve as many existing trees as possible and 2) mitigate highway noise impacts. Kiewit moved forward with the community's goals in mind and constructed 1,300 feet of noise wall as early as possible, in a location where residences were within 75 feet of the work. Recognizing the community's appreciation of the forested corridor, WSDOT included a contract incentive to save trees. **Kiewit developed a Tree Preservation Plan that included shifting the alignment of the noise wall** to provide a treed buffer between the wall and the right of way, preserving 47 trees; a number above the goal identified by WSDOT in the general provisions (See Figure 2, 3). **Kiewit's innovative and detailed solutions to reduce impacts to the trees and increase the aesthetical appeal within the community facilitated** WSDOT awarding Kiewit with the maximum tree incentive allowed by the contract.

### **Innovative Problem Solving**

Proactive measures were taken **to align regulatory recommendations with construction** of the I-405 Bothell project. Regulators including the Department of Fish and Wildlife, U.S. Army Corps of Engineers, and DOE were notified well in advance of environmentally-sensitive operations to avoid delays to the project. Kiewit took regulatory recommendations seriously and incorporated their perspectives into the design and construction of the corridor, developing a strong partnership and level of trust between regulators and the construction team.

Kiewit utilized methods beyond standard BMP's to manage construction stormwater. By grinding out a 2' wide by 2" deep section into the existing shoulder, a conveyance channel was created in the pavement surface to capture and transport construction stormwater to the Baker tanks (See Figure 5). This practice diverted stormwater away from the top of slopes where during high intensity rainfall events the water could have potentially led to significant slope erosion. After settling, stormwater could be sent to the sanitary sewer or to a swale to infiltrate. Typical inlet protection BMP's were not used; instead catch basins *adjacent* to the channel were *permanently* sealed for the duration of the project. Using the NPDES permit requirements as a template, Kiewit utilized a daily 'punchlist' system to track corrective measures, with a dedicated three person TESC crew repairing and installing BMP's to ensure compliance. **These methods went above and beyond ordinary BMP's** to continually reduce slope erosion, riling, and turbid discharges.

**Adapting to unexpected conditions was a frequent occurrence** on the I-405 Bothell project because of the unpredictable weather and challenging site conditions. During dry conditions on a Saturday night, HMA pavement installation began, and tackifier was sprayed on the existing pavement to bind it to the final lift of HMA. By Sunday morning, significant rains began in the area, where the tackifier began to mix with stormwater and run downslope with the potential to run offsite. Although nearby catch basins were previously sealed, Kiewit crews were quick to move on the troubling situation. The team installed a temporary cold mix berm at the north end of the project to divert stormwater into an on-site sump. Crews then deployed rolls of

absorbent pads and booms to soak up the problematic runoff. A vactor-truck subcontractor serving as an emergency contact immediately mobilized to remove contaminated stormwater from the sump. Both the vactor-truck and Kiewit's Environmental Lead remained on-site until the rain stopped, ensuring there were no uncontrolled contaminated discharges. By following effective contaminant procedures and solving potential problems before they occurred, a significant ECAP event was avoided.

### Preventative Measures

**Early in the design phase** before significant construction began, Kiewit initiated a TESC plan that considerably reduced environmental risks at the I-405 Bothell project. This environmentally-conscious plan included installing three Baker tanks, excavating a temporary 800,000 gallon holding pond (See Figure 6), creating the asphalt conveyance channel, and obtaining a sanitary sewer permit early in the design phase of the project.

In all, **zero violations were issued from the DOE**, but six reportable Environmental Compliance Assurance Procedure (ECAP's) occurred throughout the life of the project. Each event was handled with extreme diligence and preventative measures were introduced to avoid recurrence. Five of the six incidents were a direct result of rainy conditions, as the project was built predominantly throughout the wet season. Of the six incidents, four involved turbid stormwater discharges, one involved a saturated slope failing and sloughing beyond perimeter controls, and the last incident was a request from DOE to fix a section of improperly keyed-in silt fence. **No event had long-term negative effects on the project, yet Kiewit took each instance as an opportunity to continually strengthen the environmental program.** All events spurred immediate action and resulted in improvements to future operations.

An example of Kiewit's proactive response occurred when a turbid discharge was observed flowing into a catch basin grate at the south end of the infiltration swale. Kiewit TESC crews were quick to respond, mobilizing from the north end of the project to seal the catch basin within 25 minutes of observation. **To prevent recurrence of a non-compliance event**, the catch basin was permanently sealed, and use of the infiltration ditchline for stormwater management was abandoned for the remainder of the project.

### Environmental Compliance Risk

The majority of the project was built through the wet season which presented significant risks to the project's success. Nevertheless, this complex project was built on-time and without delays for environmental events. Kiewit's plan to build a fast-paced ARRA earthwork project above a salmon bearing stream between November and May would typically be a cause of concern for WSDOT. However, Kiewit's environmentally-conscious approach made the extreme challenges of constructing an on-time project, in muddy and rainy conditions, a success. **There were 12 wetlands and five streams directly adjacent to the 1.65 mile long I-405 Bothell project.** This was a roadway widening project that, during the wet season, excavated 16,000 cubic yards to embankment, imported 47,000 tons of borrow to embankment, erected 1,300 feet of noise wall panels, constructed a steep 1.2:1 reinforced slope, put in 17,000 feet of guardrail, placed 7,600 feet of Media Filter Drain, installed four permanent underground stormwater detention vaults, and built structural earth walls above streams that contribute to North Creek, a salmon bearing stream (See Figures 8, 9, 10). Kiewit had the knowledge and expertise to accomplish this work without any violations from DOE.

### Extraordinary Response

**BMP's were an effective tool to avoid future non-compliant events.** On May 20<sup>th</sup> 2010, DOE issued a "Corrections Required" Form for track out observed at the north end of the construction egress. Consisting mostly of fine sediment, DOE expressed concern that rain could mix with the trackout and produce a turbid discharge to an unprotected catch basin 600 feet north of the project. **Kiewit corrected the situation that night.** First, the specified catch basin was sealed, and using a combination of a water truck and street sweeper, the paved shoulder was washed for approximately 3 hours until all track out was removed. A vactor-truck then removed all standing water around the catch basin. The seal was then removed, accumulated debris inside the catch basin was cleaned, and a filter sock was installed.

Kiewit implemented unique compliance methods to strengthen the environmental program. From the beginning of the project all personnel and subcontractors were required to watch a project-specific environmental indoctrination video detailing NPDES requirements and environmental risks. Project environmental compliance was discussed each morning during ,play-of-the-day' meetings, as well as each Friday during environmental toolbox topic sessions. Additionally, the project Environmental Compliance Plan was reviewed with craft, and hard copies were placed in all foreman trucks for reference in the field. Kiewit assigned project engineers to regularly monitor craft and subcontractor environmental compliance in the field, where craft displaying environmental excellence were rewarded with stickers for their hard hats. **Kiewit worked diligently with the public, including local communities and businesses** to preserve as much of the forested area as possible, maintain clean streams and wetlands, reduce noise impacts, and provide a complete product to WSDOT and the public. We are excited to present the recently completed I-405 Bothell project to the community, WSDOT and AGC for consideration as the recipient of the 2011 Partnership for Excellence in Environmental Management Award.

**Attachments:**

**Figure 1:**



*Environmental Task Force members gather in the field to discuss project compliance and Best Management Practices.*

**Source:** Kiewit I-405 Bothell project photo log.

**Figure 2:**



*Completion of the noise wall panel installation.*

**Source:** Kiewit I-405 Bothell project photo log.

**Figure 3:**



*Modifying the noise wall alignment allowed for 47 trees to be preserved, remaining within feet of the panels.*

**Source:** Kiewit I-405 Bothell project photo log.

**Figure 4:**



*The project team conducts a field inspection with the Department of Ecology.*

**Source:** Kiewit I-405 Bothell project photo log.

## Figures 5-7: Construction Stormwater Management

**Figure 5:**



*Conveyance channel ground into the shoulder pavement surface, routing stormwater to Baker Tanks.*

**Figure 6:**



*Temporary 800,000 gallon capacity plastic-lined storage pond.*

**Figure 7:**



*Infiltration swale with (15) Triangular Silt Dike check dams.*

Source: Kiewit I-405 Bothell Project photo log.

**Figure 8:**



*Preparing the foundation for largest reinforced earth wall on the project, located directly adjacent to sensitive areas including streams 64 and 66 (contributing streams to North Creek, a salmon bearing stream), as well as wetlands 25.3R and 25.4R.*

Source: Kiewit I-405 Bothell Project photo log.

**Figure 9:**



*Kiewit crews begin installation of two underground stormwater detention vaults.*  
Source: Kiewit I-405 Bothell Project photo log.

**Figure 10:**



*Kiewit crews in the beginning stages of construction of the 1.2:1 reinforced slope.*  
Source: Kiewit I-405 Bothell Project photo log.

### Additional Figure:



*Over one mile of the asphalt grind conveyance channel was created to capture and transport construction stormwater to the Baker tanks.*

**Source:** Original photograph courtesy of WSDOT website.

### Commuter Feedback:

**"I work in the North Creek Business Park and the new lane has vastly improved my evening commute. Previously, there was always a long back-up getting onto N I-405 from the NE 195th Street on-ramp, and that congestion continued until the Canyon Park exit. Ever since the new lane opened, it's been congestion-free and my commute home has been reduced by at least a ten minutes."**

**"Yesterday, first day with the new lane open, I breezed through. Thanks to WSDOT, Kiewit, all their subs and all the construction workers who worked night and day, rain and shine, to relieve one more choke point."**

**"I drove through the area yesterday (6/17/10) around 4 p.m. and breezed through the whole area AT SPEED! I have NEVER been able to do that at that time of day. I was grinning from ear to ear as I sailed through the area instead of getting stuck in the bottle-neck."**

**"So in case you folks at WSDOT (and the construction crew who did the work) don't hear THANK YOU enough, let me say it a million times over: THANK YOU!"**