



Transportation Highways & Bridges

Client

Oregon Department of
Transportation

Location

Oregon, USA

"I have found CH2M HILL's work to be satisfactory and welcome the opportunity to work with them on future projects. The team has produced quality deliverables that incorporate sound design, cost effective yet quality construction and are considerate of long term operations with regard to reliability and performance. It has been our pleasure to work with this team over the past year and we look forward to the successful completion of construction for this major design-build project."

Ron Reisdorf, PE, PLS
Project Manager
Bridge Delivery Unit
Oregon Department of
Transportation

I-5 and I-84 Design-Build Projects

Project Description

Due to widespread deterioration of highway bridges throughout the state, the Oregon Legislature enacted the third Oregon Transportation Investment Act (OTIA III) in 2003. This program included \$1.3 billion for replacing or repairing hundreds of aging structures along the state highway system over the next 8 to 10 years. CH2M HILL has been awarded four design-build contracts to date, totaling nearly \$100 million.

Through CH2M HILL's successful design-build organizational philosophy, design and construction disciplines were aligned, creating functional delivery teams of designers and constructors for each major activity such as bridges, roadways, and environmental compliance. This integrated approach supported design and construction synergy while emphasizing quality, safety, traffic control, and environmental sensitivity, and it minimized community impacts along the project corridor.

CH2M HILL projects included the following design-build efforts.

I-5 Sutherlin to Roseburg

CH2M HILL delivered design-build improvements along a 14-mile stretch of interstate 5 between Sutherlin and Roseburg. The scope of work for this \$47 million project involved replacing 10 interstate highway bridges, improving concrete barriers and guardrails, resurfacing 11 miles of asphalt pavement, improving drainage, replacing fencing, and performing other interstate maintenance work—all while eliminating closures, avoiding delays, and maintaining high levels of safety for both drivers and workers.

The improvements included work over two environmentally sensitive waterways with endangered species constraints and permitting requirements. The team also encountered differing geotechnical conditions and used deep foundations and spread footings for the bridge work.

Among the bridges replaced was the 100-foot long Route 138 overcrossing at the Sutherlin interchange. Built in 1953, the bridge was functionally obsolete and its load-carrying capacity was one of the least sufficient of the I-5 bridges identified for replacement in the state's Cracked Bridge Strategy. The design and construction approach provided two temporary lanes of traffic to facilitate travel, and keeping detours and restrictions to a minimum.

Other project successes included:

- Maximized the use of project resources from nearby design-build projects, coordinated equipment and crews to optimize schedules, and recycled pre-cast concrete box beams from temporary bridge structures
- Obtained all state and federal wetland permits early to meet accelerated startup schedule; field mobilization was complete 30 days after Notice to Proceed

- Finished the improvements so they opened for beneficial use 13 months ahead of the specified mandatory completion date

I-5 Clarks Branch to Tunnel Mill Race

The \$40 million Clarks Branch to Tunnel Mill Race project included the replacement of 10 bridges and repairs to two additional structures along a 78-mile stretch of I-5. The project involved six environmentally sensitive water crossings with endangered species, stormwater, state and federal wetland permitting requirements, and design and construction constraints. The team encountered differing geotechnical conditions and used a combination of deep foundations and spread footings for the bridge work.

As the prime design-build contractor, CH2M HILL constructed the project 4.5 months ahead of schedule by maximizing the use of project resources and leveraging reusable materials from the nearby I-5 Sutherlin to Roseburg site.

The team streamlined costs and reduced impacts to the environment by coordinating equipment and crews to optimize schedules, reusing median slabs, and recycling girders from temporary bridge structures. Temporary two-lane roadways dramatically reduced congestion, ensuring that traffic flowed safely around construction zones with few disruptions and only minor delays. Other project successes included:

- First Oregon Department of Transportation project to use OTIA III Programmatic Environmental Permits; obtained state and federal environmental permits in approximately a third of the traditional timeline
- Simultaneously maintained completion milestones on up to six active work locations

I-84 Lower Perry Replacement Bridge

This \$8.2 million design-build project replaced two bridges carrying I-84 traffic across the Grande Ronde River at the Lower Perry Interchange, approximately 7 miles north of La Grande, Oregon. As part of a joint venture, CH2M HILL provided design and construction services for the eastbound and westbound bridges and ramps.

Project constraints included a tight right-of-way, an environmentally sensitive waterway, and design and construction in a mountainous terrain. Environmental compliance was also a major focus of the project, involving endangered fish species, wetlands, and water quality issues. The design-build team developed an Environmental Management Plan to ensure compliance with biological opinions and regulatory permits, and to meet defined environmental excellence criteria. The span arrangement was designed to allow a clear span over the ordinary high water, eliminating most impacts on the environmentally sensitive Grande Ronde River. The alignment avoided wetland impacts at both ends of the project. The construction approach included several provisions for minimizing adverse environmental impacts, including the use of drilled shafts for new pier installation, drilling from existing bridge structures with full containment,

effluent treatment, temporary access bridge without driven piles, and a temporary no-pile work bridge with full containment.

Other project successes included:

- Design-build delivery opened the bridges to traffic more than 1 year ahead of contract completion date
- Significant public involvement and coordination developed community support for the project
- Outstanding safety record (0 reportable or missed work days with more than 31,910 hours worked)
- Team received a contract recognition for environmentally friendly design and construction techniques

I-5 Coast Fork Willamette River Bridge

The I-5 Coast Fork Willamette River Bridge project, one of Oregon's first design-build projects, is approximately 13 miles south of the City of Eugene. As part of a joint venture, CH2M HILL provided design and construction for the \$6 million project, which included a five-span bridge over an environmentally sensitive waterway.

Environmental compliance was a major success of the project. The biological opinion listed endangered fish species, wetlands, and water quality issues. The design-build team developed an Environmental Management Plan that reduced fills within the permitted work area, minimized wetland impacts, minimized disturbed footprint, and exceeded expectations of regulatory agencies during construction.

Other project successes included:

- Raised profile cleared the 100-year flood elevation, meeting desirable design standard and minimizing flood overtopping of freeway
- Replaced a nine-span structure with new five-span structure reduced fills within permitted work area
- Minimized traffic control delays by constructing a temporary detour structure in the median to accommodate two lanes of southbound I-5 traffic. The detoured bridge was in service 4 months ahead of contract obligation
- Delivered a design-build project that enabled the final bridge to open to traffic more than 1 year ahead of contract completion date
- Received an outstanding safety record (0 reportable or missed work days with over 21,700 hours worked)
- Project received the ODOT Environmental Excellence Award