

# **Interstate 5- Medford Viaduct Project Pacific Highway Jackson County**

**POST CONSTRUCTION REPORT ON LOW BID EXEMPTION #2002-01  
THE A+B WITH INCENTIVE/DISINCENTIVE  
CONTRACTING**

Contract Number C12746/CON01985

Key Number: 10898

Exemption Order #2002-01

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## **1- INTRODUCTION**

### **1-1 Purpose**

The Post Construction Report is an end of construction project evaluation of the alternative bidding method “A + B” with incentives/disincentives used for the “Medford Viaduct Project”. This report is required under ORS 00279.103 “Evaluation of certain public improvement projects not contracted by competitive bidding” for any public improvement project in excess of \$100,000.

A+B contracting is an alternative method of bidding where time performance is balanced with cost. In the bid process the contractor’s estimated time for the contract work is given a dollar value. The responsive bidder with the lowest “combined” total is awarded the contract. To further expedite the completion of the project, a pre-determined bonus dollar value per day is applied to the number of additional days saved by the contractor from his stated completion time and a disincentive is applied to the number of days over the stated completion time.

## **2- BACKGROUND**

### **2-1 The Project**

The purpose of the Medford Viaduct project was to rehabilitate a half-mile long bridge on the Interstate 5 corridor. This included hydro-milling the original 40 year-old concrete deck, and applying micro-silica concrete to the road surface. The bridge rails were also modified from their late 1950s design to a safer one. In addition, scour protection was added to eight of 48 bents in and near Bear Creek and Phase One seismic retrofitting was completed.

The Medford Viaduct project is Oregon’s second “A + B” contract. The Medford Viaduct carries more than 46,000 vehicles a day. Nearly 40% of this total is local Medford traffic traveling between North and South Medford Interchanges. Construction of the deck meant that the interstate would have to be narrowed to one lane in each direction, causing travel delays during peak times from interstate and local travelers. Success meant getting the interstate back to four lanes as quickly and as safely as possible since the cost of delays to interstate travel was estimated at \$10,000 a day.

This report fulfills the requirements of ORS 279.103, and the questions stated in ORS 279.103(2)(A) through ORS 279.103(2)(E) are represented as titles to Sections 3-1 through 3-5. The contents of this report completes the ORS 279.103 requirement that the public agency shall prepare and deliver to the Director of the Oregon Department of Administrative Services or the local contract review board an evaluation of the public improvement project.

### **3-1 Scope**

The Medford Viaduct project was awarded on September 30, 2002 to Wildish Standard Paving Company for \$6,282,441.24. The scope was to repair and construct a 19 meter wide, 982.2 meter long deck, overlay it with micro silica concrete and install a Phase One seismic retrofit.

Other work involved installing concrete end panels, adding scour protection to selected footings in the stream bank, and install median barrier and bridge railings.

The project was awarded using the "Cost plus Time Bidding." "Cost plus Time Bidding" takes into account the dollar bid amount (Component "A") and also the bidders proposed delivery time (Component "B") in which the project or a portion of it, will be completed. For this project, the "B" portion was called the "Specified Critical Portion of the Project". That work was summarized as the time and traffic critical bridge deck overlay, joint repair, bridge rails, median barrier, end panels and deck drains.

Additional parameters to control the work were imposed on the bidders as follows:

- The contract's latest day to complete the specified critical portion work was set at June 22, 2003.
- In addition, the maximum number of days to complete the critical deck work was 172 days.
- The critical work and lane closures were only allowed to proceed after January 2, 2003.

Wildish bid the project and committed to 142 days to complete the Specified Critical Work portion. The combination of the bid cost and the number of days to complete gave them the winning bid.

All other project work was scheduled to be completed by October 31, 2003.

### **3-2 Construction Progress**

Notice to proceed was given to Wildish on October 23, 2002. The contract required that the specified critical portion of work would not proceed until after January 2, 2003.

Anticipating poor weather and working conditions, the contractor initially planned to begin the specified critical portion of the work in February instead of January.

ODOT had built its public outreach plan for work to begin shortly after New Years' because traffic volumes—after the holidays and before Memorial Day--- would be at their lowest for the year.

The contractor's intention was not conveyed to ODOT until after the media and other critical stakeholders had been notified that there would be permanent lane closures, restrictions and impacts to the public would begin shortly after January 1, 2003.

A Contract Change Order (CCO) was written for \$200,000 to accelerate the contractors schedule to start in January as intended by ODOT, but not clearly specified in the contract provisions.

The second notification of the "B" component of the project was issued on May 8, 2003. This was 26 days ahead of the projected finish date that the contractor committed to. Wildish also submitted data that utilized the "Delay Due to Weather" specification that would allow for extra contract work days. Additional contract time would be allowed when conditions of precipitation, temperature or wind speed were worse than "reasonably predictable conditions." If the contractor's schedule was affected by these weather conditions and submitted according to specifications, they would be granted additional contract time. They were able to secure nine additional days to their time to complete the specified critical portion of the work.

In addition to the incentive bonus of 26 days at \$8,000/day, Wildish also completed the critical work before the Memorial Day weekend and earned an additional \$100,000 (CCO 21 &3). That brought the total early completion incentives to \$308,000.

Second notification was issued on October 21, 2003. Final Inspection was performed on December 9, 2003.

### **3-3 Traffic Control**

A request for the reduction of the legal posted speed limit was granted to promote safety in the work area. The speed limit in the area was reduced from 55 MPH to 45 MPH. Additionally, Oregon State Police, as part of the federal funding program, did additional patrolling of the construction area to enforce the lower speed limit.

A new type of delineation system was tested along the single lanes where the concrete barrier seemed to intimidate traffic. A new type of "crinkle reflector" was installed on the concrete barriers to direct and channel traffic through the work area. This 150 x 750 millimeter metal reflector was attached to each side of the barriers. They were installed horizontally at the leading and trailing ends, left and right lanes. This helped guide drivers, especially at night. One half the cost of these reflectors was donated by 3M. ODOT purchased the other half. The

contractor was paid to install them (CCO 8). These reflectors were returned to ODOT for reuse on other projects. These reflectors were cost-effective and helped delineate the lane changes better.

**3-4 ACTUAL COSTS COMPARED WITH ORIGINAL ESTIMATES**

Below is a comparison of the actual project construction costs as compared with the original engineering estimate. State economist determined there is a \$10,000 per day cost to the public resulting from traffic disruptions on the interstate due to construction. The \$10,000 per day is the basis for incentive/disincentive of work completed early or later than the date established by the contractor.

\*The B component doesn't truly fit into the actual project cost.

**Engineering Estimate**

Project cost "A" component	\$10,963,025.77
*Project "B" component (172 days x \$8,000/day) \$1,376,000	
Anticipated items, contingencies & engineering	\$1,589,641.44
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Total Cost:	\$12,552,667.21

**Low Bid Results**

Project low bid "A" component	\$6,282,441.24
*Project "B" component (142 days x \$8,000/day) \$1,136,000	
Anticipated items, construction & engineering	\$1,589,641.44
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Total Cost:	\$7,872,082.68

**Final Costs**

Project final cost "A" component total including bonus:	
(1) Bid Item final Works:	\$6,134,292.69
(2) Contract Change Orders, Adjustments	\$769,510.09
(3) Engineering	\$660,000.00
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Total Project Final Cost	\$7,563,802.78

**Project Scheduled Durations**

ODOT Schedule Project Duration	172 Days Maximum
Project Bid Duration	142 Days
Total actual time used in construction	116 Days

### 3-5 Amount of any guaranteed price

This project did not contain a guaranteed maximum price agreement.

### 3-6 Number of Change Orders Issued by ODOT

To complete the construction within the scope of the design of this project, a number of Contract Changes were issued. A total of 30 changes were written to the contract and all changes to the contract totaled \$ \$453,477.26.

All changes were identified as follows:

30 Contract Change Orders and SFO for a total cost of:	\$464,845.78
Time bonus:	\$ 308,000.00
Adjustments:	\$-3,335.71
Bid line item net quantity changes	\$-148,148.55
Total net changes in contract	\$621,361.52

### 3-7 Summary of Changes

Among the 30 Contract Change Orders (CCO's) issued, most changes were minor and normal to the contract work.

As explained previously, the contractor initially planned to begin the specified critical portion of work in February instead of January, anticipating poor weather and working conditions. This information was not conveyed to ODOT until after the public information campaign had begun about permanent lane closures, restriction and impacts to the public beginning in January. A CCO (#3) was written for \$200,000 to accelerate the contractor's schedule to start in early January as intended by ODOT, but not specified in the contract provisions.

This project's bridge design was outsourced to OBEC Consulting Engineers. It was found that the overlay grades shown in the contract were incorrect. This required the contractor to modify their layout of the screed rails for the finish machine. The time delays, resurvey and labor to adjust the rails totaled \$21,219 (CCO#9).

As a result, the added thickness in the overlay caused the elastomeric nosing at the joints to overrun. Cost: \$41,000 (CCO #19)

The subcontractor for the bridge rail work found that the existing concrete rail expansion joints would transfer into the new rail. These joints, up to 75 millimeters wide, were not covered in the contract plans. This resulted in an additional \$14,000 (CCO #15).

The Type 3 guard rail and reconnections at the north end of the project were found to be substandard. Due to the lengthening of the bridge end panels and the set back of the existing rail, the connections had to be redesigned and lengthened. Cost \$8,227 (CCO 17).

During the excavation and repave of the shoulders at the southeast end of the project, a set of ODOT traffic counter loops had to be cut and replaced. CCO #6 \$13,970.

The remaining CCOs were for minor changes, additional work, design errors or omitted plans, all less than \$3,000 each. The total of unanticipated change orders was \$453,477.26

### **3-8 – Cost Overrun of Contract Work Bid Items**

- The bid item “Temporary Plastic Drums” and temporary striping were over by \$16,620. This was due to an extension of the southbound lane closure to encompass a vertical curve that obstructed the traffic’s view of the on-coming lane closure.
- Temporary Silt Fence was over by \$5,520 due to the need for additional fencing. This was to protect the slopes around the end bents during the hydro-milling containment and the excavation at the scour protection footings along Bear Creek.
- 142.8 cubic meters of Micro Silica Concrete was used over the 1,050 cu/meters required due to incorrect contract plans and the need to redesign it. The added volume costing \$42,840 was needed to get the minimum 38 millimeters overlay and fill the low sag areas on the spans.
- 326 extra meters of asphalt were needed costing \$3,912 over the 160 square meters required. This was due to contractors’ excavations which cut into the walkways from bent 35-to-38. There was a three-way junction of walkways at this spot and this contributed to the over run.
- Nearly 27 additional meters of Type 3 Guard Rail costing \$5,340 was needed over the 3.8 meters required because the designer did not account for the rail offset when the end panel connection was moved back into the existing rail.

### **3-9 Cost Under run of Contract Work Bid Items**

BI-#380: Furnish and drive sheet pile: Used 425 of 790 square meters. This was due to the estimated quantity error. Also, the minimum tip elevation was raised an average of 0.6 meters to utilize shorter ODOT sheets. The contractor only drove the sheets to the minimum elevation as no bearing was specified. Savings of \$82,125.

BI- #290: General excavation: used 706 meters of the 1,000 estimated. North end shoulder dig outs were reduced when discovered that the roadway structure was more substantial than what contract was to build. Savings: \$8,820

BI-#370- ODOT furnished sheet pile: used 256 square meters of 320 square meters used. Reason: some sheets were too short to use in the work. Savings of \$8,000.

BI #57- Aggregate Base: used 11.79 mg of 130 mg. for a savings of \$4,137.35. Reason: Dig out at the north end of viaduct was reduced when the structure was found to be more substantial than anticipated. (same as bid item 29).

BI#58-Level 3 19 millimeter HMAC Pavement: used 1,956.67 of 2,600 m.g. for a savings of \$22,516.55. Same reason as given in BI 57 and 29.

### **4.0 – OTHER INNOVATIVE CONSTRUCTION PRACTICES;**

After the contract was awarded to Wildish Standard Paving Company, the Rogue Valley ODOT construction office met with company officials to enter into a Partnering Agreement. For the project to have success in construction, it was imperative to have such an agreement to catch problems before they became serious. This was a win between ODOT and Wildish, and also for the public.

Due to the close proximity of the Medford Viaduct to local housing, motels and businesses, the project development team asked the City of Medford for an exemption to the its noise ordinance. A maximum limit to the noise level of 88 DBa from 10 p.m. to 7 a.m. would be allowed only if ODOT provided noise monitoring stations at critical areas along the project. This was provided and the contractors' activities were effectively observed and controlled by this system.

To assist the public with project awareness, education and condition of traffic flow, ODOT installed four cameras at critical areas of the project. These cameras were attached to a project website that ODOT maintained for 24 hours a day observations of the traffic. This cost versus benefit gain is indeterminate as it is unknown what impacts they may have had. However, the cameras were part of the strategic communications plan for the project that included one-on-one visits to neighboring business and other project stakeholders.

## **5 - CONCLUSIONS:**

The Medford Viaduct project was anticipated to cause severe impacts to the neighboring homes and businesses and to the traveling public, both local and interstate. Through ODOT's efforts to coordinate with the media, local governments, emergency services and the public, all stakeholders were informed as to what could be expected in the work area.

This awareness contributed to local drivers using the local street networks to get around Medford instead of using the interstate. This reduction in volume also could be the reason there were no major accidents which could have temporarily closed the interstate. Delays due to traffic back ups were mostly due to the public slowing down to view the work activities.

Anecdotal evidence during and after this project by elected city officials, community opinion leaders and the general public showed a keen awareness of the project's success and has engendered goodwill toward the agency and its function of maintaining the state transportation system. It is hoped the success will continue as the agency begins significant work in the Rogue Valley, especially the North and South Interchange projects.

Of the original estimated budget of \$7,872,082.68, the project ran under budget by **\$327,619.16** or by **4.2%**.

By every analysis, the Medford Viaduct project and the A+B budgeting was a success to Oregon stakeholders and taxpayers.