



OREGON DEPARTMENT OF TRANSPORTATION

Research Unit  
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**SPR Quarterly Progress Report**  
July 1, 2008 through September 30, 2008

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Date September 30, 2008

**TO:** Technical Advisory Committee Members:

James Garrard, ODOT  
Ray Bottenberg, ODOT  
Steven Soltesz, ODOT  
Tim Rogers, FHWA  
Bernie Covino, NETL

**FROM:** Steve Soltesz, Research Engineer, phone: (503) 986-2851

**1. Project**

Replacing Thermal Sprayed Zinc Anodes  
SPR # 682

**2. Key Dates**

Start Date for ODOT: July 2008  
Completion Date for ODOT: September 2010

**3. Principal Investigator**

Xianming Shi, PhD, PE  
Associate Research Professor  
Corrosion and Sustainable Infrastructure Laboratory  
Western Transportation Institute  
Montana State University  
Bozeman, MT 59717-4250

**4. Progress**

- Task 1: Survey of the current practice (45% complete)

The research team has conducted a comprehensive literature review to gather existing information relevant to this project, including CP basics, concrete surface preparation, anode material options, methods of testing anode performance and predicting anode

service life, methods of anode application/installation and replacement, methods of monitoring performance of CP systems, and other advancements in the CP technologies. A detailed Internet-based search was conducted, using online databases; and a draft literature review report has been prepared. On the basis of the literature review, the research team has also designed an online survey aimed to capture the CP field experience of ODOT and other identified agencies, with particular emphasis on their successes or failures with the use of thermally sprayed zinc to protect bridge substructures and methods for old anode removal and surface preparation before the new anode application. CP experience of other industries such as those protecting naval facilities and parking structures will be sought, potentially through the survey of consulting firms such as Corpro and Vector. In the next reporting period, the draft survey will be delivered to the TAC for review and comments before distribution to the right contacts.

- Task 2: Investigation methods of zinc anode removal and concrete surface preparation (0% complete)
- Task 3: Final report and presentation (0% complete)

## 5. **Problems**

- None encountered so far. It should be noted, however, that the actual research contract was not signed until August 7, 2008, which caused some delay in the project schedule. The research team at WTI-MSU has requested and is waiting for concrete slabs (from previous research projects) to be provided by the National Energy Technology Laboratory (NETL) before we can proceed on Task 2.

## 6. **Work Planned for Next Quarter**

- We plan to complete Task 1 in the next quarter and deliver a literature review report documenting Task 1 findings
- Task 2 will commence once the concrete slabs are provided by NETL. Utilizing the research findings from Task 1, the research team will identify, investigate and compare the various methods used to remove existing thermally sprayed zinc anodes and to further treat the concrete surface prior to the new anode application. To identify key factors to be investigated and to aid the experimental design, the research team will consult existing surface preparation standards. In the WTI Corrosion and Sustainable Infrastructure Laboratory, the research team will experiment various methods to remove existing TS-Zn anodes and methods to further treat the concrete surface prior to the new TS-Zn anode application, using hundreds of specimens cored from reinforced concrete slabs provided by the NETL, which feature TS-Zn anode coating electrochemically aged to various degrees.

## 7. **Finances**

<b>VENDOR</b>	<b>FY'09</b>	<b>FY'10</b>	<b>FY11</b>	<b>FY'12</b>	<b>TOTALS</b>
ORIGINAL BUDGET	\$ -	\$ -			\$ -
<b>REVISED BUDGET</b>	<b>\$ 125,227</b>	<b>\$ 64,773</b>	<b>\$ -</b>		<b>\$ 190,000</b>
EXPENDITURES - VENDOR	\$ -	\$ -	\$ -	\$ -	\$ -
<b>BALANCE</b>	<b>\$ 125,227</b>	<b>\$ 64,773</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 190,000</b>
<b>ODOT</b>	<b>FY'09</b>	<b>FY'10</b>	<b>FY11</b>	<b>FY'12</b>	<b>TOTALS</b>
ORIGINAL BUDGET	\$61,250	\$122,500	\$61,250		\$ 245,000
<b>REVISED BUDGET</b>	<b>\$5,000</b>	<b>\$5,000</b>	<b>\$0</b>		<b>\$ 10,000</b>
EXPENDITURES - ODOT	\$ 1,794	\$ -	\$ -	\$ -	\$ 1,794
<b>BALANCE</b>	<b>\$ 3,206</b>	<b>\$ 5,000</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 8,206</b>
<b>PROJECT</b>	<b>FY'09</b>	<b>FY'10</b>	<b>FY11</b>	<b>FY'12</b>	<b>TOTALS</b>
ORIGINAL BUDGET	\$ 61,250	\$ 122,500	\$ 61,250	\$ -	\$ 245,000
<b>REVISED BUDGET</b>	<b>\$ 130,227</b>	<b>\$ 69,773</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 200,000</b>
EXPENDITURES - PROJECT	\$ 1,794	\$ -	\$ -		\$ 1,794
<b>BALANCE</b>	<b>\$ 128,433</b>	<b>\$ 69,773</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 198,206</b>

WTI Expenditures

	Budget	Curr Period	To Date
Receipts:	190,000	.00	.00
Expenditures:			
Salaries	78,585	7,165.65	7,165.65
Benefits	25,934	2,731.28	2,731.28
Travel	6,192	.00	.00
Communication	200	.00	.00
Supplies	13,000	.00	.00
Sub Contracts	10,365	.00	.00
Direct_Cost	134,276	9,896.93	9,896.93
Indirect_Cost	55,724	4,206.19	4,206.19
Total:	190,000.00	14,103.12	14,103.12