

# Bent Repairs

PROGRESS PAYMENT CERTIFICATE  
 McCORMICK RANKIN CORPORATION  
 2655 NORTH SHERIDAN WAY  
 MISSISSAUGA, ONTARIO L5K 2P8

Bent #120 to #129 incl.  
 OWNER: CITY OF TORONTO - TECHNICAL SERVICES

CONTRACT NUMBER : XXXXXXXX  
 CONTRACTOR : XXXXXXXX

Date: September 2013  
 Period from  
 PAYMENT CERTIFICATE NUMBER: XX

Item No.	Stand/Spec Specification	Description	Unit	Unit Bid Price	Contract Quantity	Rev. Contr. Qty	Contract Amount	Total To Date		Period		% Compl.
								Quantity	Amount	Quantity	Amount	
<b>Part A - General</b>												
001	S.2, TS1,10	Field Office	L.S.	\$ 21,200.00	1.00	1.00	\$ 21,200.00	-	\$ -	-	\$ -	0%
002	S.3	Cellular Phone (Provisional Sum)	P.S.	\$ 5,300.00	1.00	1.00	\$ 5,300.00	-	\$ -	-	\$ -	0%
003	S.4, TS 1,00	Traffic Control Persons, Signs & Barricades, etc.	L.S.	\$ 70,000.00	1.00	1.00	\$ 70,000.00	-	\$ -	-	\$ -	0%
004	S.6	Miscellaneous Works (Provisional Item)	P.S.	\$ 300,000.00	1.00	1.00	\$ 300,000.00	-	\$ -	-	\$ -	0%
<b>Part A - General Total (Excl. HST)</b>									\$ -		\$ -	0%
<b>Part B - Traffic Control</b>												
			L.S.	\$ -	1.00	1.00	\$ -	-	\$ -	-	\$ -	0%
<b>Part B - Traffic Control Total (Excl. HST)</b>									\$ -		\$ -	#DIV/0!
<b>Part C - Structure Rehabilitation</b>												
005	S.17, OPSS919	Access & Protection - Bent 120	L.S.	\$ 125,000.00	1.00	1.00	\$ 125,000.00	-	\$ -	-	\$ -	0%
006	S.17, OPSS919	Access & Protection - Bent 121	L.S.	\$ 125,000.00	1.00	1.00	\$ 125,000.00	-	\$ -	-	\$ -	0%
007	S.17, OPSS919	Access & Protection - Bent 122	L.S.	\$ 125,000.00	1.00	1.00	\$ 125,000.00	-	\$ -	-	\$ -	0%
008	S.17, OPSS919	Access & Protection - Bent 123	L.S.	\$ 125,000.00	1.00	1.00	\$ 125,000.00	-	\$ -	-	\$ -	0%
009	S.17, OPSS919	Access & Protection - Bent 124	L.S.	\$ 125,000.00	1.00	1.00	\$ 125,000.00	-	\$ -	-	\$ -	0%
010	S.17, OPSS919	Access & Protection - Bent 125	L.S.	\$ 125,000.00	1.00	1.00	\$ 125,000.00	-	\$ -	-	\$ -	0%
011	S.17, OPSS919	Access & Protection - Bent 126	L.S.	\$ 125,000.00	1.00	1.00	\$ 125,000.00	-	\$ -	-	\$ -	0%
012	S.17, OPSS919	Access & Protection - Bent 127	L.S.	\$ 125,000.00	1.00	1.00	\$ 125,000.00	-	\$ -	-	\$ -	0%
013	S.17, OPSS919	Access & Protection - Bent 128	L.S.	\$ 125,000.00	1.00	1.00	\$ 125,000.00	-	\$ -	-	\$ -	0%
014	S.17, OPSS919	Access & Protection - Bent 129	L.S.	\$ 125,000.00	1.00	1.00	\$ 125,000.00	-	\$ -	-	\$ -	0%
015	S.20, OPSS510, OPSS928	Concrete Removal - Bent Beams	m3	\$ 1,500.00	100.00	100.00	\$ 150,000.00	-	\$ -	-	\$ -	0%
016	S.20, OPSS510, OPSS928	Concrete Removal - Bent Columns & Retaining Walls	m3	\$ 1,500.00	120.00	120.00	\$ 180,000.00	-	\$ -	-	\$ -	0%
017	S.21, S.23, OPSS904, OPSS929, OPSS930, TS930	Concrete in Refacing - Bent Beams	m3	\$ 2,500.00	145.00	145.00	\$ 362,500.00	-	\$ -	-	\$ -	0%
018	S.21, S.23, OPSS904, OPSS929, OPSS950, TS930	Concrete in Refacing - Bent Columns & Retaining Walls	m3	\$ 2,500.00	175.00	175.00	\$ 437,500.00	-	\$ -	-	\$ -	0%
019	S.24, OPSS905	Supply & Place Galvanized Welded Wire Reinforcing	m2	\$ 25.00	2,600.00	2,600.00	\$ 65,000.00	-	\$ -	-	\$ -	0%
020	S.25, OPSS905	Reinforcing Steel	t	\$ 5,000.00	1.00	1.00	\$ 5,000.00	-	\$ -	-	\$ -	0%
021	S.34, TS9.00	Surface Seal Concrete	m2	\$ 30.00	2,600.00	2,600.00	\$ 78,000.00	-	\$ -	-	\$ -	0%
022	No Bid											
<b>Part C - Structure Rehabilitation Total (Excl. HST)</b>									\$ -		\$ -	0%

PROGRESS PAYMENT CERTIFICATE  
 McCORMICK RANKIN CORPORATION  
 2655 NORTH SHERIDAN WAY  
 MISSISSAUGA, ONTARIO L5K 2P8

Date: September 2013  
 Period from  
 PAYMENT CERTIFICATE NUMBER: XX

Bent #120 to #129 Incl.  
 OWNER: CITY OF TORONTO - TECHNICAL SERVICES  
 CONTRACT NUMBER : XXXXXXXX  
 CONTRACTOR : XXXXXXXX

Item No.	Stand/Spec Specification	Description	Unit	Unit Bid Price	Contract Quantity	Rev. Contr.Qty	Contract Amount	Total To Date		Previous		% Compl.
								Quantity	Amount	Quantity	Amount	
<b>Part D - Miscellaneous</b>												
023	S.38	Modification of Existing Drainage Hoppers	each	\$ 2,100.00		0.00	\$ -	-	\$ -	-	\$ -	#DIV/0!
024	S.38	Installation of New FRP 200mm Diameter Drain Pipe (complete with all new brackets & hardware)	m	\$ 300.00		0.00	\$ -	-	\$ -	-	\$ -	#DIV/0!
025	S.39	Bent Column Number	each	\$ 100.00	10.00	10.00	\$ 1,000.00	-	\$ -	-	\$ -	0%
026	S.41	Drainage Pad	each	\$ 500.00		0.00	\$ -	-	\$ -	-	\$ -	#DIV/0!
<b>Part D - Miscellaneous Total (Exc. HST)</b>									\$ -		\$ -	0%
<b>Part E - Full Depth Deck Repairs</b>												
				\$ -	1.00	1.00	\$ -	-	\$ -	-	\$ -	0%
<b>Part E - Full Depth Deck Repairs Total (Exc. HST)</b>									\$ -		\$ -	#DIV/0!
<b>Grand Total (Excl. HST)</b>									\$ -		\$ 2,925,500.00	0%
<b>EXTRA WORK ORDERS</b>												
CO #1			L.S.	\$ -	1.00	1.00	\$ -	-	\$ -	-	\$ -	0%
<b>TOTAL - EXTRA WORK ORDERS</b>									\$ -		\$ -	0%

2/11/2013 #N/A

PROGRESS PAYMENT CERTIFICATE  
 McCORMICK RANKIN CORPORATION  
 2655 NORTH SHERIDAN WAY  
 MISSISSAUGA, ONTARIO L5K 2P8

Date: September 2013  
 Period from  
 PAYMENT CERTIFICATE NUMBER: XX

OWNER: CITY OF TORONTO - TECHNICAL SERVICES  
 CONTRACT NUMBER : XXXXXXXX  
 CONTRACTOR : XXXXXXXX

Item	Description	Contract Amount	Total to Date	Total This Period
<b>SUMMARY</b>				
	Part A - General	\$ 396,500.00	\$ -	\$ -
	Part B - Traffic Control	\$ -	\$ -	\$ -
	Part C - Structure Rehabilitation	\$ 2,528,000.00	\$ -	\$ -
	Part D - Miscellaneous	\$ 1,000.00	\$ -	\$ -
	Part E - Full Depth Deck Repairs	\$ -	\$ -	\$ -
	Extra Work Orders	\$ -	\$ -	\$ -
<b>TOTAL</b>		<b>\$2,925,500.00</b>	<b>\$0.00</b>	<b>\$0.00</b>

HST \$380,315.00  
 Total amount of Tender \$3,305,815.00

PROGRESS PAYMENT CERTIFICATE  
McCORMICK RANKIN CORPORATION  
2655 NORTH SHERIDAN WAY  
MISSISSAUGA, ONTARIO L5K 2P8

Date: September 2013  
Period from  
PAYMENT CERTIFICATE NUMBER: XX

Bent #AY-3 to #AY-7 incl.  
OWNER: CITY OF TORONTO - TECHNICAL SERVICES  
CONTRACT NUMBER: XXXXXXXX  
CONTRACTOR: XXXXXXXX

Item No.	Stand/Spec Specification	Description	Unit	Unit Bid Price	Contract Quantity	Rev. Contr.Qty	Contract Amount	Total To Date		Previous		% Compl.
								Quantity	Amount	Quantity	Amount	
<b>Part A - General</b>												
001	S.2, TS1,10	Field Office	L.S.	\$ 21,200.00	1.00	1.00	\$ 21,200.00	-	\$ -	-	\$ -	0%
002	S.3	Cellular Phone (Provisional Sum)	P.S.	\$ 5,300.00	1.00	1.00	\$ 5,300.00	-	\$ -	-	\$ -	0%
003	S.4, TS 1,00	Traffic Control Persons, Signs & Barricades, etc.	L.S.	\$ 70,000.00	1.00	1.00	\$ 70,000.00	-	\$ -	-	\$ -	0%
004	S.6	Miscellaneous Works (Provisional Item)	P.S.	\$ 150,000.00	1.00	1.00	\$ 150,000.00	-	\$ -	-	\$ -	0%
<b>Part A - General Total (Excl. HST)</b>									\$ 246,500.00		\$ -	0%
<b>Part B - Traffic Control</b>												
<b>Part B - Traffic Control Total (Excl. HST)</b>									\$ -		\$ -	#DIV/0!
<b>Part C - Structure Rehabilitation</b>												
004	S.17, OPSS919	Access & Protection - Bent AY-3	L.S.	\$ 20,000.00	1.00	1.00	\$ 20,000.00	-	\$ -	-	\$ -	0%
005	S.17, OPSS919	Access & Protection - Bent AY-4	L.S.	\$ 20,000.00	1.00	1.00	\$ 20,000.00	-	\$ -	-	\$ -	0%
006	S.17, OPSS919	Access & Protection - Bent AY-5	L.S.	\$ 20,000.00	1.00	1.00	\$ 20,000.00	-	\$ -	-	\$ -	0%
007	S.17, OPSS919	Access & Protection - Bent AY-6	L.S.	\$ 20,000.00	1.00	1.00	\$ 20,000.00	-	\$ -	-	\$ -	0%
008	S.17, OPSS919	Access & Protection - Bent AY-7	L.S.	\$ 20,000.00	1.00	1.00	\$ 20,000.00	-	\$ -	-	\$ -	0%
009	S.20, OPSS910, OPSS928	Concrete Removal - Bent Beams	m3	\$ 1,500.00	20.00	20.00	\$ 30,000.00	-	\$ -	-	\$ -	0%
010	S.20, OPSS910, OPSS928	Concrete Removal - Bent Columns & Retaining Walls	m3	\$ 1,500.00	5.00	5.00	\$ 7,500.00	-	\$ -	-	\$ -	0%
011	S.21, S.23, OPSS904, OPSS929, OPSS930, TS930	Concrete in Refacing - Bent Beams	m3	\$ 2,500.00	30.00	30.00	\$ 75,000.00	-	\$ -	-	\$ -	0%
012	S.21, S.23, OPSS904, OPSS928, OPSS950, TS930	Concrete in Refacing - Bent Columns & Retaining Walls	m3	\$ 2,500.00	5.00	5.00	\$ 12,500.00	-	\$ -	-	\$ -	0%
013	S.24, OPSS905	Supply & Place Galvanized Welded Wire Reinforcing	m2	\$ 25.00	300.00	300.00	\$ 7,500.00	-	\$ -	-	\$ -	0%
014	S.25, OPSS905	Reinforcing Steel	t	\$ 5,000.00	1.00	1.00	\$ 5,000.00	-	\$ -	-	\$ -	0%
015	S.34, TS9,00	Surface Seal Concrete	m2	\$ 30.00	300.00	300.00	\$ 9,000.00	-	\$ -	-	\$ -	0%
016		No Bid										
<b>Part C - Structure Rehabilitation Total (Excl. HST)</b>									\$ 246,500.00		\$ -	0%
<b>Part D - Miscellaneous</b>												
017	S.38	Modification of Existing Drainage Hoppers	each	\$ 2,100.00		0.00	\$ -	-	\$ -	-	\$ -	#DIV/0!
018	S.38	Installation of New FRP 200mm Diameter Drain Pipe (complete with all new brackets & hardware)	m	\$ 300.00		0.00	\$ -	-	\$ -	-	\$ -	#DIV/0!
019	S.39	Bent Column Number	each	\$ 100.00	5.00	5.00	\$ 500.00	-	\$ -	-	\$ -	0%
<b>Part D - Miscellaneous Total (Excl. HST)</b>									\$ 500.00		\$ -	0%
<b>Part E - Full Depth Deck Repairs</b>												
020	S.41	Drainage Pad	each	\$ 500.00		0.00	\$ -	-	\$ -	-	\$ -	0%
<b>Part E - Full Depth Deck Repairs Total (Exc. HST)</b>									\$ -		\$ -	#DIV/0!
<b>Grand Total (Excl. HST)</b>									\$ 493,500.00		\$ -	0%
<b>EXTRA WORK ORDERS</b>												
<b>TOTAL - EXTRA WORK ORDERS</b>									\$ -		\$ -	0%

PROGRESS PAYMENT CERTIFICATE  
McCORMICK RANKIN CORPORATION  
2655 NORTH SHERIDAN WAY  
MISSISSAUGA, ONTARIO L5K 2P8

Date: September 2013  
Period from  
PAYMENT CERTIFICATE NUMBER: XX

Bent #AY-3 to #AY-7 incl.  
OWNER: CITY OF TORONTO - TECHNICAL SERVICES  
CONTRACT NUMBER: XXXXXXXX  
CONTRACTOR: XXXXXXXX

Item No.	Stand/Spec Specification	Description	Unit	Unit Bid Price	Contract Quantity	Rev. Contr.Qty	Contract Amount	Total To Date		Previous		% Compl.
								Quantity	Amount	Quantity	Amount	
<b>Part D - Miscellaneous Total (Exc. HST)</b>												
<b>Part E - Full Depth Deck Repairs</b>									\$ -		\$ -	0%
<b>Part E - Full Depth Deck Repairs Total (Exc. HST)</b>									\$ -		\$ -	#DIV/0!
<b>Grand Total (Excl. HST)</b>									\$ 493,500.00		\$ -	0%
<b>EXTRA WORK ORDERS</b>												
<b>TOTAL - EXTRA WORK ORDERS</b>									\$ -		\$ -	0%

**PROGRESS PAYMENT CERTIFICATE**  
**McCORMICK RANKIN CORPORATION**  
 2655 NORTH SHERIDAN WAY  
 MISSISSAUGA, ONTARIO L5K 2P8

Date: September 2013  
 Period from  
 PAYMENT CERTIFICATE NUMBER: XX

OWNER: CITY OF TORONTO - TECHNICAL SERVICES  
 CONTRACT NUMBER : XXXXXXX  
 CONTRACTOR : XXXXXXXXX

Item	Description	Contract Amount	Total to Date	Total This Period
<b>SUMMARY</b>				
	Part A - General	\$ 246,500.00	\$ -	\$ -
	Part B - Traffic Control	\$ -	\$ -	\$ -
	Part C - Structure Rehabilitation	\$ 246,500.00	\$ -	\$ -
	Part D - Miscellaneous	\$ 500.00	\$ -	\$ -
	Part E - Full Depth Deck Repairs	\$ -	\$ -	\$ -
	Extra Work Orders	\$ -	\$ -	\$ -
<b>TOTAL</b>		<b>\$493,500.00</b>	<b>\$0.00</b>	<b>\$0.00</b>

HST  
 Total amount of Tender  
 \$64,155.00  
\$557,655.00

21/11/2013  
 #N/A

PROGRESS PAYMENT CERTIFICATE  
 McCORMICK RANKIN CORPORATION  
 2655 NORTH SHERIDAN WAY  
 MISSISSAUGA, ONTARIO L5K 2P8

Date: September 2013  
 Period from  
 PAYMENT CERTIFICATE NUMBER: XX

Bent #GS-1 to #GS-6 incl.  
 OWNER: CITY OF TORONTO - TECHNICAL SERVICES  
 CONTRACT NUMBER : XXXXXXX  
 CONTRACTOR : XXXXXXXXX

Item No.	Stand/Spec Specification	Description	Unit	Unit Bid Price	Contract Quantity	Rev. Contr. Qty	Contract Amount	Total To Date Quantity	Total To Date Amount	Previous Quantity	Previous Amount	Period Quantity	Period Amount	% Compl.
<b>Part A - General</b>														
001	S.2, TS1,10	Field Office	L.S.	\$ 21,200.00	1.00	1.00	\$ 21,200.00	-	\$ -	-	\$ -	-	\$ -	0%
002	S.3	Cellular Phone (Provisional Sum)	P.S.	\$ 5,300.00	1.00	1.00	\$ 5,300.00	-	\$ -	-	\$ -	-	\$ -	0%
003	S.4, TS 1,00	Traffic Control Persons, Signs & Barricades, etc.	L.S.	\$ 70,000.00	1.00	1.00	\$ 70,000.00	-	\$ -	-	\$ -	-	\$ -	0%
004	S.6	Miscellaneous Works (Provisional Item)	P.S.	\$ 150,000.00	1.00	1.00	\$ 150,000.00	-	\$ -	-	\$ -	-	\$ -	0%
<b>Part A - General Total (Excl. HST)</b>														
<b>Part B - Traffic Control</b>														
<b>Part B - Traffic Control Total (Excl. HST)</b>														
<b>Part C - Structure Rehabilitation</b>														
005	S.17, OPSS919	Access & Protection - Bent GS-1	L.S.	\$ 20,000.00	1.00	1.00	\$ 20,000.00	-	\$ -	-	\$ -	-	\$ -	0%
006	S.17, OPSS919	Access & Protection - Bent GS-2	L.S.	\$ 20,000.00	1.00	1.00	\$ 20,000.00	-	\$ -	-	\$ -	-	\$ -	0%
007	S.17, OPSS919	Access & Protection - Bent GS-3	L.S.	\$ 20,000.00	1.00	1.00	\$ 20,000.00	-	\$ -	-	\$ -	-	\$ -	0%
008	S.17, OPSS919	Access & Protection - Bent GS-4	L.S.	\$ 20,000.00	1.00	1.00	\$ 20,000.00	-	\$ -	-	\$ -	-	\$ -	0%
009	S.17, OPSS919	Access & Protection - Bent GS-5	L.S.	\$ 20,000.00	1.00	1.00	\$ 20,000.00	-	\$ -	-	\$ -	-	\$ -	0%
010	S.17, OPSS919	Access & Protection - Bent GS-6	L.S.	\$ 20,000.00	1.00	1.00	\$ 20,000.00	-	\$ -	-	\$ -	-	\$ -	0%
011	S.20, OPSS510, OPSS928	Concrete Removal - Bent Beams	m3	\$ 1,500.00	15.00	15.00	\$ 22,500.00	-	\$ -	-	\$ -	-	\$ -	0%
012	S.20, OPSS510, OPSS928	Concrete Removal - Bent Columns & Retaining Walls	m3	\$ 1,500.00	10.00	10.00	\$ 15,000.00	-	\$ -	-	\$ -	-	\$ -	0%
013	S.21, S.23, OPSS904, OPSS929, OPSS930, TS930	Concrete in Retacing - Bent Beams	m3	\$ 2,500.00	25.00	25.00	\$ 62,500.00	-	\$ -	-	\$ -	-	\$ -	0%
014	S.21, S.23, OPSS904, OPSS929, OPSS950, TS930	Concrete in Retacing - Bent Columns & Retaining Walls	m3	\$ 2,500.00	10.00	10.00	\$ 25,000.00	-	\$ -	-	\$ -	-	\$ -	0%
015	S.24, OPSS905	Supply & Place Galvanized Welded Wire Reinforcing	m2	\$ 25.00	300.00	300.00	\$ 7,500.00	-	\$ -	-	\$ -	-	\$ -	0%
016	S.25, OPSS905	Reinforcing Steel	t	\$ 5,000.00	1.00	1.00	\$ 5,000.00	-	\$ -	-	\$ -	-	\$ -	0%
017	S.34, TS9,00	Surface Seal Concrete	m2	\$ 30.00	300.00	300.00	\$ 9,000.00	-	\$ -	-	\$ -	-	\$ -	0%
018		No Bid												
<b>Part C - Structure Rehabilitation Total (Excl. HST)</b>														
<b>Part D - Miscellaneous</b>														
019	S.38	Modification of Existing Drainage Hoppers	each	\$ 2,100.00	1.00	1.00	\$ 2,100.00	-	\$ -	-	\$ -	-	\$ -	#DIV/0!
020	S.38	Installation of New FRP 200mm Diameter Drain Pipe (complete with all new brackets & hardware)	m	\$ 300.00	1.00	1.00	\$ 300.00	-	\$ -	-	\$ -	-	\$ -	#DIV/0!

PROGRESS PAYMENT CERTIFICATE  
 McCORMICK RANKIN CORPORATION  
 2655 NORTH SHERIDAN WAY  
 MISSISSAUGA, ONTARIO L5K 2P8

Date: September 2013  
 Period from  
 PAYMENT CERTIFICATE NUMBER: XX

Bent #GS-1 to #GS-6 Incl.  
 OWNER: CITY OF TORONTO - TECHNICAL SERVICES  
 CONTRACT NUMBER : XXXXXXX  
 CONTRACTOR : XXXXXXX

Item No.	Stand/Spec Specification	Description	Unit	Unit Bid Price	Contract Quantity	Rev. Contr.Qty	Contract Amount	Total To Date		Previous		% Compl.
								Quantity	Amount	Quantity	Amount	
021	S.39	Bent Column Number	each	\$ 100.00	6.00	6.00	600.00	-	\$ -	-	\$ -	0%
022	S.41	Drainage Pad	each	\$ 500.00		0.00	-	-	\$ -	-	\$ -	#DIV/0!
<b>Part D - Miscellaneous Total (Exc. HST)</b>												
							\$ 600.00	-	\$ -	-	\$ -	0%
<b>Part E - Full Depth Deck Repairs</b>												
			L.S.	\$ -	1.00	1.00	-	-	\$ -	-	\$ -	0%
<b>Part E - Full Depth Deck Repairs Total (Exc. HST)</b>												
							\$ -	-	\$ -	-	\$ -	#DIV/0!
<b>Grand Total (Excl. HST)</b>												
							\$ 513,600.00	-	\$ -	-	\$ -	0%
EXTRA WORK ORDERS												
CO #1			L.S.	\$ -	1.00	1.00	-	-	\$ -	-	\$ -	0%
<b>TOTAL - EXTRA WORK ORDERS</b>												

2/11/2013 #N/A

PROGRESS PAYMENT CERTIFICATE  
 McCORMICK RANKIN CORPORATION  
 2655 NORTH SHERIDAN WAY  
 MISSISSAUGA, ONTARIO L5K 2P8

Date: September 2013  
 Period from  
 PAYMENT CERTIFICATE NUMBER: XX

OWNER: CITY OF TORONTO - TECHNICAL SERVICES  
 CONTRACT NUMBER : XXXXXXX  
 CONTRACTOR : XXXXXXX

Item	Description	Contract Amount	Total to Date	Total This Period
<b>SUMMARY</b>				
	Part A - General	\$ 246,500.00	\$ -	\$ -
	Part B - Traffic Control	\$ -	\$ -	\$ -
	Part C - Structure Rehabilitation	\$ 266,500.00	\$ -	\$ -
	Part D - Miscellaneous	\$ 600.00	\$ -	\$ -
	Part E - Full Depth Deck Repairs	\$ -	\$ -	\$ -
	Extra Work Orders	\$ -	\$ -	\$ -
<b>TOTAL</b>		<b>\$513,600.00</b>	<b>\$0.00</b>	<b>\$0.00</b>

HST \$66,768.00  
 Total amount of Tender \$580,368.00

PROGRESS PAYMENT CERTIFICATE  
McCORMICK RANKIN CORPORATION  
2655 NORTH SHERIDAN WAY  
MISSISSAUGA, ONTARIO L5K 2P8

Date: September 2013  
Period from  
PAYMENT CERTIFICATE NUMBER: XX

Bent #AJ-1 to #AJ-13 incl.  
OWNER: CITY OF TORONTO - TECHNICAL SERVICES  
CONTRACT NUMBER: XXXXXXXX  
CONTRACTOR: XXXXXXXX

Item No.	Stand/Spec Specification	Description	Unit	Unit Bid Price	Contract Quantity	Rev. Contr.Qty	Contract Amount	Total To Date		Previous Quantity	Period Amount	% Compl.
								Quantity	Amount			
<b>Part A - General</b>												
001	S.2, TS1,10	Field Office	L.S.	\$ 21,200.00	1.00	1.00	\$ 21,200.00	-	\$ -	-	\$ -	0%
002	S.3	Cellular Phone (Provisional Sum)	P.S.	\$ 5,300.00	1.00	1.00	\$ 5,300.00	-	\$ -	-	\$ -	0%
003	S.4, TS 1,00	Traffic Control Persons, Signs & Barricades, etc.	L.S.	\$ 70,000.00	1.00	1.00	\$ 70,000.00	-	\$ -	-	\$ -	0%
004	S.6	Miscellaneous Works (Provisional Item)	P.S.	\$ 120,000.00	1.00	1.00	\$ 120,000.00	-	\$ -	-	\$ -	0%
<b>Part A - General Total (Excl. HST)</b>									\$ -		\$ -	0%
<b>Part B - Traffic Control</b>												
<b>Part B - Traffic Control Total (Excl. HST)</b>			L.S.	\$ -	1.00	1.00	\$ -	-	\$ -	-	\$ -	0%
<b>Part C - Structure Rehabilitation</b>												
005	S.17, OPSS919	Access & Protection - Bent AJ-1	L.S.	\$ 25,000.00	1.00	1.00	\$ 25,000.00	-	\$ -	-	\$ -	0%
006	S.17, OPSS919	Access & Protection - Bent AJ-2	L.S.	\$ 25,000.00	1.00	1.00	\$ 25,000.00	-	\$ -	-	\$ -	0%
007	S.17, OPSS919	Access & Protection - Bent AJ-3	L.S.	\$ 25,000.00	1.00	1.00	\$ 25,000.00	-	\$ -	-	\$ -	0%
008	S.17, OPSS919	Access & Protection - Bent AJ-4	L.S.	\$ 25,000.00	1.00	1.00	\$ 25,000.00	-	\$ -	-	\$ -	0%
009	S.17, OPSS919	Access & Protection - Bent AJ-5	L.S.	\$ 25,000.00	1.00	1.00	\$ 25,000.00	-	\$ -	-	\$ -	0%
010	S.17, OPSS919	Access & Protection - Bent AJ-6	L.S.	\$ 25,000.00	1.00	1.00	\$ 25,000.00	-	\$ -	-	\$ -	0%
011	S.17, OPSS919	Access & Protection - Bent AJ-7	L.S.	\$ 25,000.00	1.00	1.00	\$ 25,000.00	-	\$ -	-	\$ -	0%
012	S.17, OPSS919	Access & Protection - Bent AJ-8	L.S.	\$ 25,000.00	1.00	1.00	\$ 25,000.00	-	\$ -	-	\$ -	0%
013	S.17, OPSS919	Access & Protection - Bent AJ-9	L.S.	\$ 25,000.00	1.00	1.00	\$ 25,000.00	-	\$ -	-	\$ -	0%
014	S.17, OPSS919	Access & Protection - Bent AJ-10	L.S.	\$ 25,000.00	1.00	1.00	\$ 25,000.00	-	\$ -	-	\$ -	0%
015	S.17, OPSS919	Access & Protection - Bent AJ-11	L.S.	\$ 25,000.00	1.00	1.00	\$ 25,000.00	-	\$ -	-	\$ -	0%
016	S.17, OPSS919	Access & Protection - Bent AJ-12	L.S.	\$ 25,000.00	1.00	1.00	\$ 25,000.00	-	\$ -	-	\$ -	0%
017	S.17, OPSS919	Access & Protection - Bent AJ-13	L.S.	\$ 25,000.00	1.00	1.00	\$ 25,000.00	-	\$ -	-	\$ -	0%
018	S.20, OPSS510, OPSS928	Concrete Removal - Bent Beams	m3	\$ 1,500.00	50.00	50.00	\$ 75,000.00	-	\$ -	-	\$ -	0%
019	S.20, OPSS510, OPSS928	Concrete Removal - Bent Columns & Retaining Walls	m3	\$ 1,500.00	40.00	40.00	\$ 60,000.00	-	\$ -	-	\$ -	0%
020	S.21, S.23, OPSS904, OPSS929, OPSS930, TS930	Concrete in Refacing - Bent Beams	m3	\$ 2,500.00	75.00	75.00	\$ 187,500.00	-	\$ -	-	\$ -	0%
021	S.21, S.23, OPSS904, OPSS929, OPSS950, TS930	Concrete in Refacing - Bent Columns & Retaining Walls	m3	\$ 2,500.00	60.00	60.00	\$ 150,000.00	-	\$ -	-	\$ -	0%
022	S.24, OPSS905	Supply & Place Galvanized Welded Wire Reinforcing	m2	\$ 25.00	1,100.00	1,100.00	\$ 27,500.00	-	\$ -	-	\$ -	0%
023	S.25, OPSS905	Reinforcing Steel	t	\$ 5,000.00	1.00	1.00	\$ 5,000.00	-	\$ -	-	\$ -	0%
024	S.34, TS910	Surface Seal Concrete	m2	\$ 30.00	1,100.00	1,100.00	\$ 33,000.00	-	\$ -	-	\$ -	0%
<b>Part C - Structure Rehabilitation Total (Excl. HST)</b>									\$ -		\$ -	0%
<b>Part D - Miscellaneous</b>												
026	S.38	Modification of Existing Drainage Hoppers	each	\$ 2,100.00		0.00	\$ -	-	\$ -	-	\$ -	#DNV/01
027	S.38	Installation of New FRP 200mm Diameter Drain Pipe (complete with all new brackets & hardware)	m	\$ 300.00		0.00	\$ -	-	\$ -	-	\$ -	#DNV/01
028	S.39	Bent Column Number	each	\$ 100.00	13.00	13.00	\$ 1,300.00	-	\$ -	-	\$ -	0%
029	S.41	Drainage Pad	each	\$ 500.00		0.00	\$ -	-	\$ -	-	\$ -	#DNV/01
<b>Part D - Miscellaneous Total (Excl. HST)</b>									\$ -		\$ -	0%
<b>Part E - Full Depth Deck Repairs</b>												
<b>Part E - Full Depth Deck Repairs Total (Excl. HST)</b>			L.S.	\$ -	1.00	1.00	\$ -	-	\$ -	-	\$ -	0%
<b>Grand Total (Excl. HST)</b>									\$ -		\$ -	0%
<b>EXTRA WORK ORDERS</b>												
CG #1			L.S.	\$ -	1.00	1.00	\$ -	-	\$ -	-	\$ -	0%
<b>TOTAL - EXTRA WORK ORDERS</b>									\$ -		\$ -	0%

PROGRESS PAYMENT CERTIFICATE  
McCORMICK RANKIN CORPORATION  
2655 NORTH SHERIDAN WAY  
MISSISSAUGA, ONTARIO L5K 2P8

Date: September 2013  
Period from  
PAYMENT CERTIFICATE NUMBER: XX

Bent #AJ-1 to #AJ-13 incl.  
OWNER: CITY OF TORONTO - TECHNICAL SERVICES  
CONTRACT NUMBER: XXXXXXXX  
CONTRACTOR: XXXXXXXX

Item No.	Stand/Spec Specification	Description	Unit	Unit Bid Price	Contract Quantity	Rev. Contr.Qty	Contract Amount	Total To Date		Previous Quantity	Period Amount	% Compl.
								Quantity	Amount			
<b>Part C - Structure Rehabilitation Total (Excl. HST)</b>												
<b>Part D - Miscellaneous</b>									\$ -		\$ -	0%
026	S.38	Modification of Existing Drainage Hoppers	each	\$ 2,100.00		0.00	\$ -	-	\$ -	-	\$ -	#DNV/01
027	S.38	Installation of New FRP 200mm Diameter Drain Pipe (complete with all new brackets & hardware)	m	\$ 300.00		0.00	\$ -	-	\$ -	-	\$ -	#DNV/01
028	S.39	Bent Column Number	each	\$ 100.00	13.00	13.00	\$ 1,300.00	-	\$ -	-	\$ -	0%
029	S.41	Drainage Pad	each	\$ 500.00		0.00	\$ -	-	\$ -	-	\$ -	#DNV/01
<b>Part D - Miscellaneous Total (Excl. HST)</b>									\$ -		\$ -	0%
<b>Part E - Full Depth Deck Repairs</b>												
<b>Part E - Full Depth Deck Repairs Total (Excl. HST)</b>			L.S.	\$ -	1.00	1.00	\$ -	-	\$ -	-	\$ -	0%
<b>Grand Total (Excl. HST)</b>									\$ -		\$ -	0%
<b>EXTRA WORK ORDERS</b>												
CG #1			L.S.	\$ -	1.00	1.00	\$ -	-	\$ -	-	\$ -	0%
<b>TOTAL - EXTRA WORK ORDERS</b>									\$ -		\$ -	0%

**PROGRESS PAYMENT CERTIFICATE**  
**McCORMICK RANKIN CORPORATION**  
**2655 NORTH SHERIDAN WAY**  
**MISSISSAUGA, ONTARIO L5K 2P8**

Date: September 2013  
 Period from  
 PAYMENT CERTIFICATE NUMBER: XX

OWNER: CITY OF TORONTO - TECHNICAL SERVICES  
 CONTRACT NUMBER : XXXXXXX  
 CONTRACTOR : XXXXXXXXX

Item	Description	Contract Amount	Total to Date	Total This Period
<b>SUMMARY</b>				
	Part A - General	\$ 216,500.00	\$ -	\$ -
	Part B - Traffic Control	\$ -	\$ -	\$ -
	Part C - Structure Rehabilitation	\$ 863,000.00	\$ -	\$ -
	Part D - Miscellaneous	\$ 1,300.00	\$ -	\$ -
	Part E - Full Depth Deck Repairs	\$ -	\$ -	\$ -
	Extra Work Orders	\$ -	\$ -	\$ -
<b>TOTAL</b>		<b>\$1,080,800.00</b>	<b>\$0.00</b>	<b>\$0.00</b>

HST  
 Total amount of Tender  
 \$140,504.00  
 \$1,221,304.00

21/11/2013  
 #N/A

PROGRESS PAYMENT CERTIFICATE  
 McCORMICK RANKIN CORPORATION  
 2655 NORTH SHERIDAN WAY  
 MISSISSAUGA, ONTARIO L5K 2P8

Date: September 2013  
 Period from  
 PAYMENT CERTIFICATE NUMBER: XX

Bent #CJ-1 to #CJ-9 incl.  
 OWNER: CITY OF TORONTO - TECHNICAL SERVICES  
 CONTRACT NUMBER : XXXXXXX  
 CONTRACTOR : XXXXXXXXX

Item No.	Stand/Spec Specification	Description	Unit	Unit Bid Price	Contract Quantity	Rev. Contr. Qty	Contract Amount	Total To Date		Period		% Compl.
								Quantity	Amount	Quantity	Amount	
<b>Part A - General</b>												
001	S.2, TS1,10	Field Office	L.S.	\$ 21,200.00	1.00	1.00	\$ 21,200.00	-	\$ -	-	\$ -	0%
002	S.3	Cellular Phone (Provisional Sum)	P.S.	\$ 5,300.00	1.00	1.00	\$ 5,300.00	-	\$ -	-	\$ -	0%
003	S.4, TS 1,00	Traffic Control Persons, Signs & Barricades, etc.	L.S.	\$ 70,000.00	1.00	1.00	\$ 70,000.00	-	\$ -	-	\$ -	0%
004	S.6	Miscellaneous Works (Provisional Item)	P.S.	\$ 74,000.00	1.00	1.00	\$ 74,000.00	-	\$ -	-	\$ -	0%
<b>Part A - General Total (Excl. HST)</b>									\$ -		\$ -	0%
<b>Part B - Traffic Control</b>												
<b>Part B - Traffic Control Total (Excl. HST)</b>									\$ -		\$ -	0%
<b>Part C - Structure Rehabilitation</b>												
005	S.17, OPSS919	Access & Protection - Bent CJ-1	L.S.	\$ 15,000.00	1.00	1.00	\$ 15,000.00	-	\$ -	-	\$ -	0%
006	S.17, OPSS919	Access & Protection - Bent CJ-2	L.S.	\$ 15,000.00	1.00	1.00	\$ 15,000.00	-	\$ -	-	\$ -	0%
007	S.17, OPSS919	Access & Protection - Bent CJ-3	L.S.	\$ 15,000.00	1.00	1.00	\$ 15,000.00	-	\$ -	-	\$ -	0%
008	S.17, OPSS919	Access & Protection - Bent CJ-4	L.S.	\$ 15,000.00	1.00	1.00	\$ 15,000.00	-	\$ -	-	\$ -	0%
009	S.17, OPSS919	Access & Protection - Bent CJ-5	L.S.	\$ 15,000.00	1.00	1.00	\$ 15,000.00	-	\$ -	-	\$ -	0%
010	S.17, OPSS919	Access & Protection - Bent CJ-6	L.S.	\$ 15,000.00	1.00	1.00	\$ 15,000.00	-	\$ -	-	\$ -	0%
011	S.17, OPSS919	Access & Protection - Bent CJ-7	L.S.	\$ 15,000.00	1.00	1.00	\$ 15,000.00	-	\$ -	-	\$ -	0%
012	S.17, OPSS919	Access & Protection - Bent CJ-8	L.S.	\$ 15,000.00	1.00	1.00	\$ 15,000.00	-	\$ -	-	\$ -	0%
013	S.17, OPSS919	Access & Protection - Bent CJ-9	L.S.	\$ 15,000.00	1.00	1.00	\$ 15,000.00	-	\$ -	-	\$ -	0%
014	S.20, OPSS510, OPSS928	Concrete Removal - Bent Beams	m3	\$ 1,500.00	30.00	30.00	\$ 45,000.00	-	\$ -	-	\$ -	0%
015	S.20, OPSS510, OPSS928	Concrete Removal - Bent Columns & Retaining Walls	m3	\$ 1,500.00	30.00	30.00	\$ 45,000.00	-	\$ -	-	\$ -	0%
016	S.21, S.23, OPSS904, OPSS929, OPSS930, TS930	Concrete in Relacing - Bent Beams	m3	\$ 2,500.00	40.00	40.00	\$ 100,000.00	-	\$ -	-	\$ -	0%
017	S.21, S.23, OPSS904, OPSS929, OPSS950, TS930	Concrete in Relacing - Bent Columns & Retaining Walls	m3	\$ 2,500.00	40.00	40.00	\$ 100,000.00	-	\$ -	-	\$ -	0%
018	S.24, OPSS905	Supply & Place Galvanized Welded Wire Reinforcing	m2	\$ 25.00	700.00	700.00	\$ 17,500.00	-	\$ -	-	\$ -	0%
019	S.25, OPSS905	Reinforcing Steel	t	\$ 5,000.00	1.00	1.00	\$ 5,000.00	-	\$ -	-	\$ -	0%
020	S.34, TS9,00	Surface Seal Concrete	m2	\$ 30.00	700.00	700.00	\$ 21,000.00	-	\$ -	-	\$ -	0%
021	No Bid											
<b>Part C - Structure Rehabilitation Total (Excl. HST)</b>									\$ -		\$ -	0%
<b>Part D - Miscellaneous</b>												

PROGRESS PAYMENT CERTIFICATE  
 McCORMICK RANKIN CORPORATION  
 2655 NORTH SHERIDAN WAY  
 MISSISSAUGA, ONTARIO L5K 2P8

Date: September 2013  
 Period from  
 PAYMENT CERTIFICATE NUMBER: XX

Bent #CJ-1 to #CJ-9 incl.  
 OWNER: CITY OF TORONTO - TECHNICAL SERVICES  
 CONTRACT NUMBER : XXXXXXXX  
 CONTRACTOR : XXXXXXXX

Item No.	Stand/Spec	Description	Unit	Unit Bid Price	Contract Quantity	Rev. Contr. Qty	Contract Amount	Total To Date		Previous		% Compl.
								Quantity	Amount	Quantity	Amount	
022	S.38	Modification of Existing Drainage Hoppers	each	\$ 2,100.00	0.00	0.00	-	-	-	-	-	#DIV/0!
023	S.38	Installation of New FRP 200mm Diameter Drain Pipe (complete with all new brackets & hardware)	m	\$ 300.00	0.00	0.00	-	-	-	-	-	#DIV/0!
024	S.39	Bent Column Number	each	\$ 100.00	9.00	9.00	900.00	-	-	-	-	0%
025	S.41	Drainage Pad	each	\$ 500.00	0.00	0.00	-	-	-	-	-	#DIV/0!
<b>Part D - Miscellaneous Total (Exc. HST)</b>												
<b>Part E - Full Depth Deck Repairs</b>												
<b>Part E - Full Depth Deck Repairs Total (Exc. HST)</b>												
<b>Grand Total (Excl. HST)</b>								\$	639,900.00	\$	-	0%
<b>EXTRA WORK ORDERS</b>												
<b>TOTAL - EXTRA WORK ORDERS</b>												
<b>CD #1</b>								\$	1.00	\$	1.00	0%

21/11/2013 #N/A

PROGRESS PAYMENT CERTIFICATE  
 McCORMICK RANKIN CORPORATION  
 2655 NORTH SHERIDAN WAY  
 MISSISSAUGA, ONTARIO L5K 2P8

Date: September 2013  
 Period from  
 PAYMENT CERTIFICATE NUMBER: XX

OWNER: CITY OF TORONTO - TECHNICAL SERVICES  
 CONTRACT NUMBER : XXXXXXXX  
 CONTRACTOR : XXXXXXXX

Item	Description	Contract Amount	Total to Date	Total This Period
<b>SUMMARY</b>				
	Part A - General	\$ 170,500.00	\$ -	\$ -
	Part B - Traffic Control	\$ -	\$ -	\$ -
	Part C - Structure Rehabilitation	\$ 468,500.00	\$ -	\$ -
	Part D - Miscellaneous	\$ 900.00	\$ -	\$ -
	Part E - Full Depth Deck Repairs	\$ -	\$ -	\$ -
	Extra Work Orders	\$ -	\$ -	\$ -
<b>TOTAL</b>		<b>\$639,900.00</b>	<b>\$0.00</b>	<b>\$0.00</b>

HST \$83,187.00  
 Total amount of Tender \$723,087.00



# Maintenance Cost Estimate

## Maintenance Cost

A = Annual Maintenance

B = OSIM Inspection

C = Detailed Inspection

### 13-Year Plan

Year		A \$ (1000s)	B \$ (1000s)	C \$ (1000s)	$\Sigma(A\sim C)$ \$ (1000s)	Inflation	Cost (\$ M)
2014	1	1,000	300	1,250	2,550	1.025	\$2.614
2015	2	1,000		1,250	2,250	1.051	\$2.364
2016	3	1,000	300	1,250	2,550	1.077	\$2.746
2017	4	1,000		1,250	2,250	1.104	\$2.484
2018	5	1,000	300	1,250	2,550	1.131	\$2.885
2019	6	1,000		1,250	2,250	1.160	\$2.609
2020	7	1,000	300	1,250	2,550	1.189	\$3.031
2021	8	1,000		1,250	2,250	1.218	\$2.741
2022	9	1,000	300	1,250	2,550	1.249	\$3.185
<b>Total (Year 2013 ~2022)</b>							<b>\$24.659</b>
2023	10	1,000		1,250	2,250	1.280	\$2.880
2024	11	1,000	300	1,250	2,550	1.312	\$3.346
2025	12	1,000		1,250	2,250	1.345	\$3.026
<b>Grand Total (Year 2013 ~ 2025)</b>							<b>\$33.911</b>

### Plan beyond 13 Years

Year		A \$ (1000s)	B \$ (1000s)	C \$ (1000s)	$\Sigma(A\sim C)$ \$ (1000s)	Inflation	Cost (\$ M)
2026	13	1,000	300	1,250	2,550	1.379	\$3.515
2027	14	1,000		1,250	2,250	1.413	\$3.179
2028	15	1,000	300	1,250	2,550	1.448	\$3.693
2029	16	1,000		1,250	2,250	1.485	\$3.340
2030	17	1,000	300	1,250	2,550	1.522	\$3.880
2031	18	1,000		1,250	2,250	1.560	\$3.509
2032	19	1,000	300	1,250	2,550	1.599	\$4.077
2033	20	1,000		1,250	2,250	1.639	\$3.687
2034	21	1,000	300	1,250	2,550	1.680	\$4.283
2035	22	1,000		1,250	2,250	1.722	\$3.874
2036	23	1,000	300	1,250	2,550	1.765	\$4.500
2037	24	1,000		1,250	2,250	1.809	\$4.070
2038	25	1,000	300	1,250	2,550	1.854	\$4.728
<b>Grand Total</b>							<b>\$50.334</b>

# Capital Construction Cost Estimate

## Accelerated Construction Method

### Accelerated Method (E-A1: Bent #91 - #182)

No.	Item	Unit	Quantity	Unit Cost	Cost
1	General	LS	1	\$567,000	\$567,000
2	Traffic Control	LS	1	\$4,176,235	\$4,176,235
3	Structural				
	• Access and Protection (Superstructure)	m <sup>2</sup>	59525	\$50	\$2,976,250
	• Full Depth Asphalt and Waterproofing Removal	m <sup>2</sup>	55197	\$5.5	\$303,584
	• Removal and Disposal of Existing Glare Screen	m	1630	\$12	\$19,560
	• Removal and Salvage Existing Parapet Wall Rails	m	3920	\$30	\$117,600
	• Removal of Median Barrier	m	1960	\$50	\$98,000
	• Removal of Concrete Parapet Wall	m	3920	\$200	\$784,000
	• Removal of Existing Drainage Hoppers and Pipes	ea	262	\$1,000	\$262,000
	• Access and Protection (Bent)	ea	92	\$40,000	\$3,680,000
	• Jacking	ea	66	\$25,000	\$1,650,000
	• Removal of Existing Bearings	ea	3100	\$300	\$930,000
	• Removal of Concrete at Bearing Seat	m <sup>3</sup>	225	\$4,000	\$900,000
	• Installation of Dowels	ea	30000	\$10	\$300,000
	• Concrete in Bearing Seat	m <sup>3</sup>	894	\$3,500	\$3,129,000
	• New Bearings	ea	3100	\$700	\$2,170,000
	• Setup Fabrication Facility	LS	1	\$3,500,000	\$3,500,000
	• Structural Steel Fabrication	T	8929	\$3,500	\$31,251,500
	• Studs	ea	300000	\$5	\$1,500,000
	• Additional Steel Erection Diaphragms	ea	370	\$5,000	\$1,850,000
	• Structural Steel Coating	m <sup>2</sup>	13000	\$200	\$2,600,000
	• Structural Steel Delivery to Pre-fabrication Facility	T	8929	\$200	\$1,785,800
	• Concrete in Deck	m <sup>3</sup>	13400	\$2,200	\$29,480,000
	• Delivery of Deck and Girder Segments	ea	679	\$15,000	\$10,185,000
	• Removal of Existing Deck and Girder Segments	ea	679	\$20,000	\$13,580,000
	• Erection of Deck and Girder Segments	LS	1	\$8,200,000	\$8,200,000
	• Closure Joint (Longitudinal)	m <sup>3</sup>	550	\$10,000	\$5,500,000
	• Closure Joint (Continuity)	m <sup>3</sup>	720	\$850	\$612,000
	• Concrete in Barrier Walls and LP Bases	m <sup>3</sup>	1398	\$1,800	\$2,516,400
	• Concrete in Median Barrier	m	1960	\$200	\$392,000
	• Concrete in Expansion Joint Dams	m <sup>3</sup>	255	\$1,500	\$382,500
	• SS Rebar (Deck & Barrier Wall)	T	1740	\$9,000	\$15,660,000
	• Deck Drain	ea	276	\$2,500	\$690,000
	• Drain Pipes	m	6500	\$400	\$2,600,000
	• Expansion Joint	m	670	\$3,500	\$2,345,000
	• Waterproofing	m <sup>2</sup>	55197	\$45	\$2,483,865
				Structural - Total	\$154,434,059
4	Paving	LS	1	\$2,186,100	\$2,186,100
5	Electrical	LS	1	\$2,731,800	\$2,731,800
6	Miscellaneous Items (5%)	LS	1	\$11,000,000	\$11,000,000
7	Contingency (20%)	LS	1	\$44,000,000	\$44,000,000

**Total \$219,095,194**

**Accelerated Method (E-A2: Bent #252 - #341)**

No.	Item	Unit	Quantity	Unit Cost	Cost
1	General	LS	1	\$627,000	\$627,000
2	Traffic Control	LS	1	\$4,345,955	\$4,345,955
3	Structural				
	• Access and Protection (Superstructure)	m <sup>2</sup>	71500	\$50	\$3,575,000
	• Full Depth Asphalt and Waterproofing Removal	m <sup>2</sup>	66347	\$5.5	\$364,909
	• Removal and Disposal of Existing Glare Screen	m	2083	\$12	\$24,996
	• Removal and Salvage Existing Parapet Wall Rails	m	5342	\$30	\$160,260
	• Removal of Median Barrier	m	1795	\$50	\$89,750
	• Removal of Concrete Parapet Wall	m	4490	\$200	\$898,000
	• Removal of Existing Drainage Hoppers and Pipes	ea	301	\$1,000	\$301,000
	• Access and Protection (Bent)	ea	89	\$40,000	\$3,560,000
	• Jacking	ea	181	\$25,000	\$4,525,000
	• Removal of Existing Bearings	ea	2716	\$300	\$814,800
	• Removal of Concrete at Bearing Seat	m <sup>3</sup>	270	\$4,000	\$1,080,000
	• Installation of Dowels	ea	29200	\$10	\$292,000
	• Concrete in Bearing Seat	m <sup>3</sup>	1115	\$3,500	\$3,902,500
	• New Bearings	ea	2716	\$700	\$1,901,200
	• Setup Fabrication Facility	LS	1	\$3,500,000	\$3,500,000
	• Structural Steel Fabrication	T	10725	\$3,500	\$37,537,500
	• Studs	ea	360000	\$5	\$1,800,000
	• Additional Steel Erection Diaphragms	ea	440	\$5,000	\$2,200,000
	• Structural Steel Coating	m <sup>2</sup>	15643	\$200	\$3,128,600
	• Structural Steel Delivery to Pre-fabrication Facility	T	10725	\$200	\$2,145,000
	• Concrete in Deck	m <sup>3</sup>	15790	\$2,200	\$34,738,000
	• Delivery of Deck and Girder Segments	ea	728	\$15,000	\$10,920,000
	• Removal of Existing Deck and Girder Segments	ea	728	\$20,000	\$14,560,000
	• Erection of Deck and Girder Segments	LS	1	\$8,800,000	\$8,800,000
	• Closure Joint (Longitudinal)	m <sup>3</sup>	651	\$10,000	\$6,510,000
	• Closure Joint (Continuity)	m <sup>3</sup>	860	\$850	\$731,000
	• Concrete in Barrier Walls and LP Bases	m <sup>3</sup>	1887	\$1,800	\$3,396,600
	• Concrete in Median Barrier	m	1795	\$200	\$359,000
	• Concrete in Expansion Joint Dams	m <sup>3</sup>	308	\$1,500	\$462,000
	• SS Rebar (Deck & Barrier Wall)	T	2020	\$9,000	\$18,180,000
	• Deck Drain	ea	301	\$2,500	\$752,500
	• Drain Pipes	m	8000	\$400	\$3,200,000
	• Expansion Joint	m	765	\$3,500	\$2,677,500
	• Waterproofing	m <sup>2</sup>	66347	\$45	\$2,985,615
				Structural - Total	\$180,072,730
4	Paving	LS	1	\$2,675,850	\$2,675,850
5	Electrical	LS	1	\$2,743,060	\$2,743,060
6	Miscellaneous Items (5%)	LS	1	\$13,000,000	\$13,000,000
7	Contingency (20%)	LS	1	\$52,000,000	\$52,000,000

**Total \$255,464,595**

**Life Cycle Cost Analysis**

**Conventional Construction**

**Summary of Present Value Analysis - Conventional Construction**

1) Present Value for Capital Construction and General Maintenance

- A = Total Present Value for Capital Construction Cost (\$ 1000s)
- B = Total Present Value for General Maintenance defined in Section 4.1.5 of the report (\$ 1000s)
- C = Present Value for Residual Value (\$ 1000s)
- D = Net Present Value (\$ 1000s)

Contract	Present Value			
	A	B	C	D
E1	60,129	6,161	314	65,976
E2	77,375	5,105	1,214	81,266
E3	45,557	5,097	1,309	49,345
E4	35,902	3,703	1,186	38,419
E5	38,141	4,009	1,660	40,490
E6	49,803	6,008	2,778	53,034
E7	67,541	5,392	3,904	69,029
E8	16,099	1,264	1,115	16,248
E9	4,478	357	344	4,491
E10	4,695	374	391	4,677
E11	5,788	462	522	5,728
E12	57,876	2,674	5,843	54,708
E13	42,243	1,935	4,875	39,303
#341 ~ East Abut.	9,810	1,797	2,313	9,294
"Ps" & "Pn"	12,238	1,857	2,188	11,908
Bent Repair	111,032	27,972	3,105	135,898
Steel Coating	70,837	39,511	3,589	106,759
<b>Total</b>	<b>709,544</b>	<b>113,676</b>	<b>36,648</b>	<b>786,572</b>

2) Present Value for Miscellaneous Maintenance

(Miscellaneous Maintenance defined in Section 4.1.5 of the report)  
**90,830** (\$ 1000s)

3) Summary of Present Values

- Present Value for Capital Construction = \$710 M
- Present Value for Maintenance = \$205 M
- Present Value for Residual Value = \$37 M
- **Net Present Value = \$877 M**

4) Life Cycle Cost by year 2091 in 2013 dollars

**\$1,660 M**

**Present Value Analysis**

**Section E1**

Base Year **2013**

Year	Cost \$ (1000s)	PV \$ (1000s)	
2013	0		
2014	1	16,098	15,705
2015	2	28,554	27,178
2016	3	18,572	17,246
2031	18	1,009	647
2046	33	1,009	447
2046	33	6,953	3,078
2061	48	1,009	308
2076	63	1,009	213
2076	63	6,953	1,467
2091	78	2,152	314

- Year 1 Construction (E)
- Year 2 Construction (E)
- Year 3 Construction (E)
- Mill, Repave, Replace joint seal (A)
- Mill, Repave, Replace joint seal
- New Pavement, E.J. and Waterproofing (C)
- Mill, Repave, Replace joint seal
- Mill, Repave, Replace joint seal
- New Pavement, E.J. and Waterproofing
- End of life of structure (Residual Value)

**60,129**

**6,161**

**314**

**65,976**

- Total Present Value for Capital Construction Cost
- Total Present Value for General Maintenance
- Present Value for Residual Value
- Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2091	2106	2091
Remaining Life (Year)	0	15	0
Capital Cost	1,009	6,953	63,224
Value at Target Year	1,009	4,801	63,224
Differential Value	0	2,152	0
(Residual Value at Target Year)			<b>2,152</b>

**Life Cycle Cost in 2013 dollars**

**81,166** \$ (1000s)

**Present Value Analysis**

**Section E2**

Year		Cost \$ (1000s)	PV \$ (1000s)	
2013	0			
2017	4	28,195	25,543	Year 1 Construction (E)
2017	4	166	150	Interim Repair
2018	5	28,195	24,920	Year 2 Construction (E)
2018	5	2,385	2,108	E-M3 included for analysis
2019	6	28,195	24,312	Year 3 Construction (E)
2019	6	395	341	Interim Repair
2034	21	900	536	Mill, Repave, Replace joint seal (A)
2049	36	900	370	Mill, Repave, Replace joint seal
2049	36	6,205	2,551	New Pavement, E.J. and Waterproofing (C)
2064	51	900	255	Mill, Repave, Replace joint seal
2079	66	900	176	Mill, Repave, Replace joint seal
2079	66	6,205	1,216	New Pavement, E.J. and Waterproofing
2091	78	8,330	1,214	End of life of structure (Residual Value)
		<b>77,375</b>		Total Present Value for Capital Construction Cost
		<b>5,105</b>		Total Present Value for General Maintenance
		<b>1,214</b>		Present Value for Residual Value
		<b>81,266</b>		Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2094	2109	2094
Remaining Life (Year)	3	18	3
Capital Cost	900	6,205	84,585
Value at Target Year	836	3,978	78,546
Differential Value	64	2,227	6,039
(Residual Value at Target Year)			<b>8,330</b>

**Life Cycle Cost in 2013 dollars**

**103,541** \$ (1000s)

**Present Value Analysis**

**Section E3**

Year		Cost \$ (1000s)	PV \$ (1000s)	
2013	0			
2020	7	27,275	22,946	Year 1 Construction (E)
2020	7	122	103	Interim Repair
2021	8	27,275	22,386	Year 2 Construction (E)
2021	8	150	123	Interim Repair
2036	23	944	535	Mill, Repave, Replace joint seal (A)
2051	38	944	369	Mill, Repave, Replace joint seal
2051	38	6,509	2,547	New Pavement, E.J. and Waterproofing (C)
2066	53	944	255	Mill, Repave, Replace joint seal
2081	68	944	176	Mill, Repave, Replace joint seal
2081	68	6,509	1,214	New Pavement, E.J. and Waterproofing
2091	78	8,982	1,309	End of life of structure (Residual Value)
			<b>45,557</b>	Total Present Value for Capital Construction Cost
			<b>5,097</b>	Total Present Value for General Maintenance
			<b>1,309</b>	Present Value for Residual Value
			<b>49,345</b>	Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2096	2111	2096
Remaining Life (Year)	5	20	5
Capital Cost	944	6,509	54,550
Value at Target Year	834	3,972	48,214
Differential Value	110	2,537	6,336
(Residual Value at Target Year)			<b>8,982</b>

**Life Cycle Cost in 2013 dollars**

**71,616** \$ (1000s)

**Present Value Analysis**

**Section E4**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2021	8	22,067
2021	8	147
2022	9	22,067
2037	24	703
2052	39	703
2052	39	4,847
2067	54	703
2082	69	703
2082	69	4,847
2091	78	8,135

Year 1 Construction (E)
Interim Repair
Year 2 Construction (E)
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
Mill, Repave, Replace joint seal
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing
End of life of structure (Residual Value)

35,902  
3,703  
1,186  
**38,419**

Total Present Value for Capital Construction Cost  
Total Present Value for General Maintenance  
Present Value for Residual Value  
Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2097	2112	2097
Remaining Life (Year)	6	21	6
Capital Cost	703	4,847	44,134
Value at Target Year	606	2,886	38,057
Differential Value	97	1,961	6,077
(Residual Value at Target Year)			<b>8,135</b>

**Life Cycle Cost in 2013 dollars**

56,787 \$ (1000s)

**Present Value Analysis**

**Section E5**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2023	10	24,713
2024	11	24,713
2039	26	800
2054	41	800
2054	41	5,513
2069	56	800
2084	71	800
2084	71	5,513
2091	78	11,392

Year 1 Construction (E)
Year 2 Construction (E)
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
Mill, Repave, Replace joint seal
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing
End of life of structure (Residual Value)

38,141  
4,009  
1,660  
**40,490**

Total Present Value for Capital Construction Cost  
Total Present Value for General Maintenance  
Present Value for Residual Value  
Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2099	2114	2099
Remaining Life (Year)	8	23	8
Capital Cost	800	5,513	49,426
Value at Target Year	657	3,124	40,566
Differential Value	143	2,389	8,860
(Residual Value at Target Year)			<b>11,392</b>

**Life Cycle Cost in 2013 dollars**

63,652 \$ (1000s)

**Present Value Analysis**

**Section E6**

Year		Cost \$ (1000s)	PV \$ (1000s)
2013	0		
2025	12	33,787	25,123
2025	12	122	91
2026	13	33,787	24,510
2026	13	110	80
2041	28	1,259	631
2056	43	1,259	435
2056	43	8,682	3,003
2071	58	1,259	301
2086	73	1,259	208
2086	73	8,682	1,431
2091	78	19,060	2,778
		<b>49,803</b>	
		<b>6,008</b>	
		<b>2,778</b>	
		<b>53,034</b>	

Year 1 Construction (E)
Interim Repair
Year 2 Construction (E)
Interim Repair
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
Mill, Repave, Replace joint seal
Mill, Repave, Replace joint seal
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing
End of life of structure (Residual Value)
Total Present Value for Capital Construction Cost
Total Present Value for General Maintenance
Present Value for Residual Value
Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2101	2116	2101
Remaining Life (Year)	10	25	10
Capital Cost	1,259	8,682	67,574
Value at Target Year	984	4,683	52,789
Differential Value	275	3,999	14,785
(Residual Value at Target Year)			<b>19,060</b>

**Life Cycle Cost in 2013 dollars**

**90,206** \$ (1000s)

**Present Value Analysis**

**Section E7**

Year		Cost \$ (1000s)	PV \$ (1000s)
2013	0		
2027	14	28,266	20,005
2027	14	4,333	3,067
2028	15	28,267	19,517
2028	15	4,333	2,992
2029	16	28,267	19,041
2029	16	4,334	2,919
2044	31	694	323
2059	46	694	223
2059	46	4,783	1,536
2059	46	3,250	1,044
2074	61	694	154
2079	66	6,500	1,274
2089	76	694	106
2089	76	4,783	732
2091	78	26,790	3,904

Year 1 Construction (E)
Bent Repair
Year 2 Construction (E)
Bent Repair
Year 3 Construction (E)
Bent Repair (B)
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
Bent Repair
Mill, Repave, Replace joint seal
Bent Repair
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing
End of life of structure (Residual Value)

**67,541**  
**5,392**  
**3,904**

**69,029**

Total Present Value for Capital Construction Cost  
Total Present Value for General Maintenance  
Present Value for Residual Value  
Net Present Value

**Residual Value**

Type of work	A	B	C	E
Target Year	2091	2,091	2091	2091
Next Replacement Year	2104	2,094	2119	2104
Remaining Life (Year)	13	3	28	13
Capital Cost	694	13,000	4,783	84,800
Value at Target Year	503	12,072	2,396	61,516
Differential Value	191	928	2,387	23,284
(Residual Value at Target Year)				<b>26,790</b>

**Life Cycle Cost in 2013 dollars**

**119,892** \$ (1000s)



**Present Value Analysis**

**Section E8**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2030	17	15,366
2031	18	9,359
2046	33	412
2061	48	412
2061	48	2,843
2076	63	412
2091	78	7,653

Year 1 Construction (E)
Year 2 Construction (E)
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
Mill, Repave, Replace joint seal
End of life of structure (Residual Value)

16,099  
1,264  
1,115  
**16,248**

Total Present Value for Capital Construction Cost  
Total Present Value for General Maintenance  
Present Value for Residual Value  
Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2091	2091	2106
Remaining Life (Year)	0	0	15
Capital Cost	412	2,843	24,725
Value at Target Year	412	2,843	17,072
Differential Value (Residual Value at Target Year)	0	0	<b>7,653</b>

**Life Cycle Cost in 2013 dollars**

**28,804** \$ (1000s)

**Present Value Analysis**

**Section E9**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2032	19	7,159
2047	34	119
2062	49	119
2062	49	823
2077	64	119
2091	78	2,359

Year 1 Construction (E)
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
Mill, Repave, Replace joint seal
End of life of structure (Residual Value)

4,478  
357  
344  
**4,491**

Total Present Value for Capital Construction Cost  
Total Present Value for General Maintenance  
Present Value for Residual Value  
Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2092	2092	2107
Remaining Life (Year)	1	1	16
Capital Cost	119	823	7,159
Value at Target Year	116	803	4,822
Differential Value (Residual Value at Target Year)	3	20	<b>2,337</b>

**Life Cycle Cost in 2013 dollars**

**8,339** \$ (1000s)

**Present Value Analysis**

**Section E10**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2033	20	7,693
2048	35	128
2063	50	128
2063	50	883
2078	65	128
2091	78	2,686

Year 1 Construction (E)
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
Mill, Repave, Replace joint seal
End of life of structure (Residual Value)

4,695	Total Present Value for Capital Construction Cost
374	Total Present Value for General Maintenance
391	Present Value for Residual Value
<b>4,677</b>	Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2093	2093	2108
Remaining Life (Year)	2	2	17
Capital Cost	128	883	7,693
Value at Target Year	122	840	5,056
Differential Value	6	43	2,637
(Residual Value at Target Year)			<b>2,686</b>

**Life Cycle Cost in 2013 dollars**

8,960 \$ (1000s)

**Present Value Analysis**

**Section E11**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2034	21	9,722
2049	36	162
2064	51	162
2064	51	1,118
2079	66	162
2091	78	3,580

Year 1 Construction (E)
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
Mill, Repave, Replace joint seal
End of life of structure (Residual Value)

5,788	Total Present Value for Capital Construction Cost
462	Total Present Value for General Maintenance
522	Present Value for Residual Value
<b>5,728</b>	Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2094	2094	2109
Remaining Life (Year)	3	3	18
Capital Cost	162	1,118	9,722
Value at Target Year	150	1,038	6,233
Differential Value	12	80	3,489
(Residual Value at Target Year)			<b>3,580</b>

**Life Cycle Cost in 2013 dollars**

11,326 \$ (1000s)

**Present Value Analysis**

**Section E12**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2035	22 62,986	36,586
2036	23 37,568	21,290
2051	38 987	386
2066	53 987	267
2066	53 6,801	1,837
2081	68 987	184
2091	78 40,093	5,843

Year 1 Construction (E)
Year 2 Construction (E)
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
Mill, Repave, Replace joint seal
End of life of structure (Residual Value)

57,876  
2,674  
5,843  
**54,708**

Total Present Value for Capital Construction Cost  
Total Present Value for General Maintenance  
Present Value for Residual Value  
Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2096	2096	2111
Remaining Life (Year)	5	5	20
Capital Cost	987	6,801	100,554
Value at Target Year	872	6,011	61,365
Differential Value	115	790	39,189
(Residual Value at Target Year)			<b>40,093</b>

**Life Cycle Cost in 2013 dollars**

110,316 \$ (1000s)

**Present Value Analysis**

**Section E13**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2037	24 29,611	16,371
2038	25 47,964	25,871
2053	40 750	279
2068	55 750	193
2068	55 5,172	1,330
2083	70 750	133
2091	78 33,454	4,875

Year 1 Construction (E)
Year 2 Construction (E)
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
Mill, Repave, Replace joint seal
End of life of structure (Residual Value)

42,243  
1,935  
4,875  
**39,303**

Total Present Value for Capital Construction Cost  
Total Present Value for General Maintenance  
Present Value for Residual Value  
Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2098	2098	2113
Remaining Life (Year)	7	7	22
Capital Cost	750	5,172	77,575
Value at Target Year	631	4,351	45,061
Differential Value	119	821	32,514
(Residual Value at Target Year)			<b>33,454</b>

**Life Cycle Cost in 2013 dollars**

84,997 \$ (1000s)

**Present Value Analysis**

**Bent #341 - East Abutment**

Year	Cost \$ (1000s)	PV \$ (1000s)
2002		
2013	0	
2020	7	212
2035	22	146
2035	22	1,738
2052	39	25,698
2067	54	66
2082	69	46
2082	69	1,738
2091	78	15,872

Deck Replacement
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
Deck Replacement (E)
Mill, Repave, Replace joint seal
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing
End of life of structure (Residual Value)

9,810  
1,797  
2,313  
**9,294**

Total Present Value for Capital Construction Cost  
Total Present Value for General Maintenance  
Present Value for Residual Value  
Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2,091	2,091	2,091
Next Replacement Year	2,097	2,112	2,127
Remaining Life (Year)	6	21	36
Capital Cost	252	1,738	25,698
Value at Target Year	217	1,035	10,564
Differential Value	35	703	15,134
(Residual Value at Target Year)			<b>15,872</b>

**Life Cycle Cost in 2013 dollars**

**30,182** \$ (1000s)

**Present Value Analysis**

**Ramps "Ps" & "Pn"**

Year	Cost \$ (1000s)	PV \$ (1000s)
1994		
2013	0	
2024	11	1,772
2046	33	27,645
2061	48	257
2076	63	257
2076	63	1,772
2091	78	15,014

Deck Replacement
New Pavement, E.J. and Waterproofing (C)
Deck Replacement (E)
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing
End of life of structure (Residual Value)

12,238  
1,857  
2,188  
**11,908**

Total Present Value for Capital Construction Cost  
Total Present Value for General Maintenance  
Present Value for Residual Value  
Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2,091	2,091	2,091
Next Replacement Year	2,091	2,106	2,121
Remaining Life (Year)	0	15	30
Capital Cost	257	1,772	27,645
Value at Target Year	257	1,224	13,179
Differential Value	0	548	14,465
(Residual Value at Target Year)			<b>15,014</b>

**Life Cycle Cost in 2013 dollars**

**31,703** \$ (1000s)

**Present Value Analysis**

**Bent Repair**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2015	2	3,933
2016	3	1,721
2027	14	20,000
2028	15	14,000
2029	16	16,500
2030	17	16,500
2031	18	10,000
2032	19	15,000
2033	20	19,000
2034	21	18,000
2035	22	19,000
2036	23	19,000
2057	44	5,000
2058	45	3,500
2059	46	4,125
2060	47	4,125
2061	48	2,500
2062	49	3,750
2063	50	4,750
2064	51	4,500
2065	52	4,750
2066	53	4,750
2077	64	10,000
2078	65	7,000
2079	66	8,250
2080	67	8,250
2081	68	5,000
2082	69	7,500
2083	70	9,500
2084	71	9,000
2085	72	9,500
2086	73	9,500
2091	78	21,305
		<b>111,032</b>
		<b>27,972</b>
		<b>3,105</b>
		<b>135,898</b>

E-M1	
E-M2	
E-M5-1	Major Rehab/Reface
E-M5-2	Major Rehab/Reface
E-M5-3	Major Rehab/Reface
E-M5-4	Major Rehab/Reface
E-M5-5	Major Rehab/Reface
E-M5-6	Major Rehab/Reface
E-M5-7	Major Rehab/Reface
E-M5-8	Major Rehab/Reface
E-M5-9	Major Rehab/Reface
E-M5-10	Major Rehab/Reface
E-M5-1	Patch/Reseal
E-M5-2	Patch/Reseal
E-M5-3	Patch/Reseal
E-M5-4	Patch/Reseal
E-M5-5	Patch/Reseal
E-M5-6	Patch/Reseal
E-M5-7	Patch/Reseal
E-M5-8	Patch/Reseal
E-M5-9	Patch/Reseal
E-M5-10	Patch/Reseal
E-M5-1	Patch/Reseal
E-M5-2	Patch/Reseal
E-M5-3	Patch/Reseal
E-M5-4	Patch/Reseal
E-M5-5	Patch/Reseal
E-M5-6	Patch/Reseal
E-M5-7	Patch/Reseal
E-M5-8	Patch/Reseal
E-M5-9	Patch/Reseal
E-M5-10	Patch/Reseal
End of life of structure (Residual Value)	
Total Present Value for Capital Construction Cost	
Total Present Value for General Maintenance	
Present Value for Residual Value	
Net Present Value	

**Present Value Analysis**

**Steel Coating**

Year	Cost \$ (1000s)	PV \$ (1000s)	
2013	0		
2027	14	23,000	16,278
2028	15	13,000	8,976
2033	20	16,000	9,764
2034	21	14,500	8,633
2035	22	15,000	8,713
2036	23	16,500	9,351
2037	24	16,500	9,122
2057	44	23,000	7,760
2058	45	13,000	4,279
2063	50	16,000	4,655
2064	51	14,500	4,116
2065	52	15,000	4,154
2066	53	16,500	4,458
2067	54	16,500	4,349
2087	74	23,000	3,700
2088	75	13,000	2,040
2091	78	24,628	3,589
			<b>70,837</b>
		265,000	<b>39,511</b>
		110,348	<b>3,589</b>
			<b>106,759</b>
			End of life of structure (Residual Value)
			Total Present Value for Capital Construction Cost
			Total Present Value for General Maintenance
			Present Value for Residual Value
			Net Present Value

  

Residual Value	Target Year	Next Repl. Y	Rem. Life	Cap. Cost	Value at Target Year	Difference
E-M6-1	2091	2117	26	23,000	12,103	10,897
E-M6-2	2091	2118	27	13,000	6,674	6,326
E-M6-3	2091	2093	2	16,000	15,229	771
E-M6-4	2091	2094	3	14,500	13,465	1,035
E-M6-5	2091	2095	4	15,000	13,589	1,411
E-M6-6	2091	2096	5	16,500	14,584	1,916
E-M6-7	2091	2097	6	16,500	14,228	2,272
						(Residual Value at Target Year) 24,628

**Life Cycle Cost in 2013 dollars**

**265,000** \$ (1000s)

**Life Cycle Cost for Maintenance Work**

(Life cycle cost for structural component maintenance/replacement is not included.)

See capital construction cost for details)

A = Annual Maintenance                      Real Discount rate, r =                      0.05  
 B = OSIM Inspection                      General Inflation Rate, f =                      0.025  
 C = Detailed Inspection                      Construction inflation Rate, f<sup>1</sup> =                      0.05

Year		A \$ (1000s)	B \$ (1000s)	C \$ (1000s)	Σ(A~C) \$ (1000s)	PV \$ (1000s)
2013	0	8,756			8,756	8,756
2014	1	1,000	300	1,250	2,550	2,488
2015	2	1,000		1,250	2,250	2,142
2016	3	1,000	300	1,250	2,550	2,368
2017	4	1,000		1,250	2,250	2,038
2018	5	1,000	300	1,250	2,550	2,254
2019	6	1,000		1,250	2,250	1,940
2020	7	1,000	300	1,250	2,550	2,145
2021	8	1,000		1,250	2,250	1,847
2022	9	1,000	300	1,250	2,550	2,042
2023	10	1,000		1,250	2,250	1,758
2024	11	1,000	300	1,250	2,550	1,943
2025	12	1,000		1,250	2,250	1,673
2026	13	1,000	300	1,250	2,550	1,850
2027	14	1,000		1,250	2,250	1,592
2028	15	1,000	300	1,250	2,550	1,761
2029	16	1,000		1,250	2,250	1,516
2030	17	1,000	300	1,250	2,550	1,676
2031	18	1,000		1,250	2,250	1,443
2032	19	1,000	300	1,250	2,550	1,595
2033	20	1,000		1,250	2,250	1,373
2034	21	1,000	300	1,250	2,550	1,518
2035	22	1,000		1,250	2,250	1,307
2036	23	1,000	300	1,250	2,550	1,445
2037	24	1,000		1,250	2,250	1,244
2038	25	1,000	300	1,250	2,550	1,375
2039	26	1,000		1,250	2,250	1,184
2040	27	1,000	300	1,250	2,550	1,309
2041	28	1,000		1,250	2,250	1,127
2042	29	1,000	300	1,250	2,550	1,246
2043	30	1,000		1,250	2,250	1,073
2044	31	1,000	300	1,250	2,550	1,186
2045	32	1,000		1,250	2,250	1,021
2046	33	1,000	300	1,250	2,550	1,129
2047	34	1,000		1,250	2,250	972
2048	35	1,000	300	1,250	2,550	1,074

2049	36	1,000		1,250	2,250	925
2050	37	1,000	300	1,250	2,550	1,023
2051	38	1,000		1,250	2,250	880
2052	39	1,000	300	1,250	2,550	973
2053	40	1,000		1,250	2,250	838
2054	41	1,000	300	1,250	2,550	927
2055	42	1,000		1,250	2,250	798
2056	43	1,000	300	1,250	2,550	882
2057	44	1,000		1,250	2,250	759
2058	45	1,000	300	1,250	2,550	839
2059	46	1,000		1,250	2,250	723
2060	47	1,000	300	1,250	2,550	799
2061	48	1,000		1,250	2,250	688
2062	49	1,000	300	1,250	2,550	760
2063	50	1,000		1,250	2,250	655
2064	51	1,000	300	1,250	2,550	724
2065	52	1,000		1,250	2,250	623
2066	53	1,000	300	1,250	2,550	689
2067	54	1,000		1,250	2,250	593
2068	55	1,000	300	1,250	2,550	656
2069	56	1,000		1,250	2,250	564
2070	57	1,000	300	1,250	2,550	624
2071	58	1,000		1,250	2,250	537
2072	59	1,000	300	1,250	2,550	594
2073	60	1,000		1,250	2,250	511
2074	61	1,000	300	1,250	2,550	565
2075	62	1,000		1,250	2,250	487
2076	63	1,000	300	1,250	2,550	538
2077	64	1,000		1,250	2,250	463
2078	65	1,000	300	1,250	2,550	512
2079	66	1,000		1,250	2,250	441
2080	67	1,000	300	1,250	2,550	488
2081	68	1,000		1,250	2,250	420
2082	69	1,000	300	1,250	2,550	464
2083	70	1,000		1,250	2,250	399
2084	71	1,000	300	1,250	2,550	442
2085	72	1,000		1,250	2,250	380
2086	73	1,000	300	1,250	2,550	420
2087	74	1,000		1,250	2,250	362
2088	75	1,000	300	1,250	2,550	400
2089	76	1,000		1,250	2,250	344
2090	77	1,000	300	1,250	2,550	381
2091	78	1,000		1,250	2,250	328
<b>Total</b>						<b>90,830</b>

Life Cycle Cost in 2013 dollars

195,956 \$ (1000s)

**Summary of Present Value Analysis - Accelerated Construction - I**

1) Present Value for Capital Construction and General Maintenance

- A = Total Present Value for Capital Construction Cost (\$ 1000s)
- B = Total Present Value for General Maintenance defined in Section 4.1.5 of the report (\$ 1000s)
- C = Present Value for Residual Value (\$ 1000s)
- D = Net Present Value (\$ 1000s)

# Accelerated Construction - I

Contract	Present Value			
	A	B	C	D
E1	60,129	6,161	314	65,976
E-A1	225,971	10,459	3,310	233,119
E-A2	238,806	14,546	7,057	246,295
E2	74,553	5,952	2,794	77,710
E3	5,193	569	287	5,475
E4	17,337	1,872	1,141	18,068
E5	5,182	567	377	5,372
E6	6,389	701	504	6,586
E7	57,876	2,674	5,843	54,708
E8	42,243	1,935	4,875	39,303
#341 ~ East Abut.	9,810	1,797	2,313	9,294
"Ps" & "Pn"	12,238	1,857	2,188	11,908
Bent Repair	110,773	27,903	3,157	135,520
Steel Coating	22,316	14,254	1,774	34,795
<b>Total</b>	<b>888,817</b>	<b>91,247</b>	<b>35,934</b>	<b>944,129</b>

2) Present Value for Miscellaneous Maintenance

(Miscellaneous Maintenance defined in Section 4.1.5 of the report)  
**90,830 (\$ 1000s)**

3) Summary of Present Values

- Present Value for Capital Construction = \$889 M
- Present Value for Maintenance = \$182 M
- Present Value for Residual Value = \$36 M
- **Net Present Value = \$1,035 M**

4) Life Cycle Cost by year 2091 in 2013 dollars

**\$1,739 M**

**Present Value Analysis**

Section E1				Base Year 2013	
Year		Cost \$ (1000s)	PV \$ (1000s)		
2013	0				
2014	1	16,098	15,705	Year 1 Construction (E)	
2015	2	28,554	27,178	Year 2 Construction (E)	
2016	3	18,572	17,246	Year 3 Construction (E)	
2031	18	1,009	647	Mill, Repave, Replace joint seal (A)	
2046	33	1,009	447	Mill, Repave, Replace joint seal	
2046	33	6,953	3,078	New Pavement, E.J. and Waterproofing (C)	
2061	48	1,009	308	Mill, Repave, Replace joint seal	
2076	63	1,009	213	Mill, Repave, Replace joint seal	
2076	63	6,953	1,467	New Pavement, E.J. and Waterproofing	
2091	78	2,152	314	End of life of structure (Residual Value)	
		<b>60,129</b>		Total Present Value for Capital Construction Cost	
		<b>6,161</b>		Total Present Value for General Maintenance	
		<b>314</b>		Present Value for Residual Value	
		<b>65,976</b>		Net Present Value	

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2091	2106	2091
Remaining Life (Year)	0	15	0
Capital Cost	1,009	6,953	63,224
Value at Target Year	1,009	4,801	63,224
Differential Value	0	2,152	0
(Residual Value at Target Year)			<b>2,152</b>

**Life Cycle Cost in 2013 dollars**

81,166 \$ (1000s)

**Present Value Analysis**

Section E-A1					
Year		Cost \$ (1000s)	PV \$ (1000s)		
2013	0				
2017	4	84,132	76,219	Year 1 Construction (E)	
2018	5	833	736	Year 1 Construction (E)	
2018	5	84,132	74,360	Year 2 Construction (E)	
2018	5	2,385	2,108	E-M3 included for analysis	
2019	6	84,132	72,547	Year 3 Construction (E)	
2034	21	1,844	1,098	Mill, Repave, Replace joint seal (A)	
2049	36	1,844	758	Mill, Repave, Replace joint seal	
2049	36	12,713	5,226	New Pavement, E.J. and Waterproofing (C)	
2064	51	1,844	523	Mill, Repave, Replace joint seal	
2079	66	1,844	361	Mill, Repave, Replace joint seal	
2079	66	12,713	2,492	New Pavement, E.J. and Waterproofing	
2091	78	22,715	3,310	End of life of structure (Residual Value)	
			<b>225,971</b>	Total Present Value for Capital Construction Cost	
			<b>10,459</b>	Total Present Value for General Maintenance	
			<b>3,310</b>	Present Value for Residual Value	
			<b>233,119</b>	Net Present Value	

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2094	2109	2094
Remaining Life (Year)	3	18	3
Capital Cost	1,844	12,713	252,396
Value at Target Year	1,712	8,151	234,375
Differential Value	132	4,562	18,021
(Residual Value at Target Year)			<b>22,715</b>

**Life Cycle Cost in 2013 dollars**

288,416 \$ (1000s)



**Present Value Analysis**

**Section E-A2**

Year	Cost \$ (1000s)	PV \$ (1000s)	
2013	0		
2021	8	97,655	80,150
2021	8	379	311
2021	8	97,655	80,150
2022	9	97,655	78,195
2037	24	2,762	1,527
2052	39	2,762	1,054
2052	39	19,041	7,269
2067	54	2,762	728
2082	69	2,762	503
2082	69	19,041	3,465
2091	78	48,427	7,057
		<b>238,806</b>	
		<b>14,546</b>	
		<b>7,057</b>	
		<b>246,295</b>	
			Year 1 Construction (E)
			Interim Repair
			Year 1 Construction (E)
			Year 3 Construction (E)
			Mill, Repave, Replace joint seal (A)
			Mill, Repave, Replace joint seal
			New Pavement, E.J. and Waterproofing (C)
			Mill, Repave, Replace joint seal
			Mill, Repave, Replace joint seal
			New Pavement, E.J. and Waterproofing
			End of life of structure (Residual Value)
			Total Present Value for Capital Construction Cost
			Total Present Value for General Maintenance
			Present Value for Residual Value
			Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2097	2112	2097
Remaining Life (Year)	6	21	6
Capital Cost	2,762	19,041	292,965
Value at Target Year	2,382	11,337	252,623
Differential Value	380	7,704	40,342
(Residual Value at Target Year)			<b>48,427</b>

**Life Cycle Cost in 2013 dollars**

**342,474** \$ (1000s)

**Present Value Analysis**

**Section E2**

Year	Cost \$ (1000s)	PV \$ (1000s)	
2013	0		
2023	10	28,266	22,081
2023	10	4,333	3,385
2024	11	28,267	21,544
2024	11	4,333	3,302
2025	12	28,267	21,018
2025	12	4,334	3,223
2040	27	694	356
2055	42	694	246
2055	42	4,783	1,696
2055	42	3,250	1,152
2070	57	694	170
2075	62	6,500	1,406
2085	72	694	117
2085	72	4,783	808
2091	78	19,175	2,794
		<b>74,553</b>	
		<b>5,952</b>	
		<b>2,794</b>	
		<b>77,710</b>	
			Year 1 Construction (E)
			Bent Repair
			Year 2 Construction (E)
			Bent Repair
			Year 3 Construction (E)
			Bent Repair (B)
			Mill, Repave, Replace joint seal (A)
			Mill, Repave, Replace joint seal
			New Pavement, E.J. and Waterproofing (C)
			Bent Repair
			Mill, Repave, Replace joint seal
			Bent Repair
			Mill, Repave, Replace joint seal
			New Pavement, E.J. and Waterproofing
			End of life of structure (Residual Value)
			Total Present Value for Capital Construction Cost
			Total Present Value for General Maintenance
			Present Value for Residual Value
			Net Present Value

**Residual Value**

Type of work	A	B	C	E
Target Year	2091	2,091	2091	2091
Next Replacement Year	2100	2,091	2115	2100
Remaining Life (Year)	9	0	24	9
Capital Cost	694	13,000	4,783	84,800
Value at Target Year	556	13,000	2,644	67,902
Differential Value	138	0	2,139	16,898
(Residual Value at Target Year)				<b>19,175</b>

**Life Cycle Cost in 2013 dollars**

**119,892** \$ (1000s)

**Present Value Analysis**

**Section E3**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2026	13	7,159
2041	28	119
2056	43	119
2056	43	823
2071	58	119
2086	73	119
2086	73	823
2091	78	1,972

Year 1 Construction (E)	
Mill, Repave, Replace joint seal (A)	
Mill, Repave, Replace joint seal	
New Pavement, E.J. and Waterproofing (C)	
Mill, Repave, Replace joint seal	
Mill, Repave, Replace joint seal	
New Pavement, E.J. and Waterproofing (C)	
End of life of structure (Residual Value)	

5,193

569

287

**5,475**

Total Present Value for Capital Construction Cost  
 Total Present Value for General Maintenance  
 Present Value for Residual Value  
 Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2101	2116	2101
Remaining Life (Year)	10	25	10
Capital Cost	119	823	7,159
Value at Target Year	93	444	5,593
Differential Value	26	379	1,566
(Residual Value at Target Year)			<b>1,972</b>

**Life Cycle Cost in 2013 dollars**

9,281 \$ (1000s)

**Present Value Analysis**

**Section E4**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2027	14	15,366
2028	15	9,359
2043	30	412
2058	45	412
2058	45	2,843
2073	60	412
2088	75	412
2088	75	2,843
2091	78	7,830

Year 1 Construction (E)	
Year 2 Construction (E)	
Mill, Repave, Replace joint seal (A)	
Mill, Repave, Replace joint seal	
New Pavement, E.J. and Waterproofing (C)	
Mill, Repave, Replace joint seal	
Mill, Repave, Replace joint seal	
New Pavement, E.J. and Waterproofing (C)	
End of life of structure (Residual Value)	

17,337

1,872

1,141

**18,068**

Total Present Value for Capital Construction Cost  
 Total Present Value for General Maintenance  
 Present Value for Residual Value  
 Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2103	2118	2103
Remaining Life (Year)	12	27	12
Capital Cost	412	2,843	24,725
Value at Target Year	306	1,460	18,384
Differential Value	106	1,383	6,341
(Residual Value at Target Year)			<b>7,830</b>

**Life Cycle Cost in 2013 dollars**

32,059 \$ (1000s)

**Present Value Analysis**

**Section E5**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2029	16	7,693
2044	31	128
2059	46	128
2059	46	883
2074	61	128
2089	76	128
2089	76	883
2091	78	2,588

Year 1 Construction (E)
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
Mill, Repave, Replace joint seal
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
End of life of structure (Residual Value)

5,182  
567  
377  
**5,372**

Total Present Value for Capital Construction Cost  
Total Present Value for General Maintenance  
Present Value for Residual Value  
Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2104	2119	2104
Remaining Life (Year)	13	28	13
Capital Cost	128	883	7,693
Value at Target Year	93	442	5,581
Differential Value	35	441	2,112
(Residual Value at Target Year)			<b>2,588</b>

**Life Cycle Cost in 2013 dollars**

9,971 \$ (1000s)

**Present Value Analysis**

**Section E6**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2030	17	9,722
2045	32	162
2060	47	162
2060	47	1,118
2075	62	162
2090	77	162
2090	77	1,118
2091	78	3,461

Year 1 Construction (E)
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
Mill, Repave, Replace joint seal
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
End of life of structure (Residual Value)

6,389  
701  
504  
**6,586**

Total Present Value for Capital Construction Cost  
Total Present Value for General Maintenance  
Present Value for Residual Value  
Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2105	2120	2105
Remaining Life (Year)	14	29	14
Capital Cost	162	1,118	9,722
Value at Target Year	115	546	6,881
Differential Value	47	572	2,841
(Residual Value at Target Year)			<b>3,461</b>

**Life Cycle Cost in 2013 dollars**

12,606 \$ (1000s)

**Present Value Analysis**

**Section E7**

Year		Cost \$ (1000s)	PV \$ (1000s)
2013	0		
2035	22	62,986	36,586
2036	23	37,568	21,290
2051	38	987	386
2066	53	987	267
2066	53	6,801	1,837
2081	68	987	184
2091	78	40,093	5,843

Year 1 Construction (E)
Year 2 Construction (E)
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
Mill, Repave, Replace joint seal
End of life of structure (Residual Value)

57,876  
2,674  
5,843  
**54,708**

Total Present Value for Capital Construction Cost  
Total Present Value for General Maintenance  
Present Value for Residual Value  
Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2096	2096	2111
Remaining Life (Year)	5	5	20
Capital Cost	987	6,801	100,554
Value at Target Year	872	6,011	61,365
Differential Value	115	790	39,189
(Residual Value at Target Year)			<b>40,093</b>

**Life Cycle Cost in 2013 dollars**

110,316 \$ (1000s)

**Present Value Analysis**

**Section E8**

Year		Cost \$ (1000s)	PV \$ (1000s)
2013	0		
2037	24	29,611	16,371
2038	25	47,964	25,871
2053	40	750	279
2068	55	750	193
2068	55	5,172	1,330
2083	70	750	133
2091	78	33,454	4,875

Year 1 Construction (E)
Year 2 Construction (E)
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
Mill, Repave, Replace joint seal
End of life of structure (Residual Value)

42,243  
1,935  
4,875  
**39,303**

Total Present Value for Capital Construction Cost  
Total Present Value for General Maintenance  
Present Value for Residual Value  
Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2098	2098	2113
Remaining Life (Year)	7	7	22
Capital Cost	750	5,172	77,575
Value at Target Year	631	4,351	45,061
Differential Value	119	821	32,514
(Residual Value at Target Year)			<b>33,454</b>

**Life Cycle Cost in 2013 dollars**

84,997 \$ (1000s)

**Present Value Analysis**

**Bent #341 - East Abutment**

Year	Cost \$ (1000s)	PV \$ (1000s)
2002		
2013	0	
2020	7	252
2035	22	252
2035	22	1,738
2052	39	25,698
2067	54	252
2082	69	252
2082	69	1,738
2091	78	15,872

Deck Replacement
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
Deck Replacement (E)
Mill, Repave, Replace joint seal
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing
End of life of structure (Residual Value)

Total Present Value for Capital Construction Cost  
 Total Present Value for General Maintenance  
 Present Value for Residual Value  
 Net Present Value

9,810  
 1,797  
 2,313  
**9,294**

**Residual Value**

Type of work	A	C	E
Target Year	2,091	2,091	2,091
Next Replacement Year	2,097	2,112	2,127
Remaining Life (Year)	6	21	36
Capital Cost	252	1,738	25,698
Value at Target Year	217	1,035	10,564
Differential Value	35	703	15,134
(Residual Value at Target Year)			<b>15,872</b>

**Life Cycle Cost in 2013 dollars**

**30,182** \$ (1000s)

**Present Value Analysis**

**Ramps "Ps" & "Pn"**

Year	Cost \$ (1000s)	PV \$ (1000s)
1994		
2013	0	
2024	11	1,772
2046	33	27,645
2061	48	257
2076	63	257
2076	63	1,772
2091	78	15,014

Deck Replacement
New Pavement, E.J. and Waterproofing (C)
Deck Replacement (E)
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing
End of life of structure (Residual Value)

12,238  
 1,857  
 2,188  
**11,908**

Total Present Value for Capital Construction Cost  
 Total Present Value for General Maintenance  
 Present Value for Residual Value  
 Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2,091	2,091	2,091
Next Replacement Year	2,091	2,106	2,121
Remaining Life (Year)	0	15	30
Capital Cost	257	1,772	27,645
Value at Target Year	257	1,224	13,179
Differential Value	0	548	14,465
(Residual Value at Target Year)			<b>15,014</b>

**Life Cycle Cost in 2013 dollars**

**31,703** \$ (1000s)

**Present Value Analysis**

**Bent Repair**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2015	2 3,933	3,743
2016	3 1,721	1,598
2027	14 20,000	14,155
2028	15 14,000	9,667
2031	18 16,500	10,579
2032	19 16,500	10,321
2029	16 10,000	6,736
2030	17 15,000	9,858
2033	20 19,000	11,595
2034	21 18,000	10,717
2035	22 19,000	11,036
2036	23 19,000	10,767
2057	44 5,000	1,687
2058	45 3,500	1,152
2061	48 4,125	1,261
2062	49 4,125	1,230
2059	46 2,500	803
2060	47 3,750	1,175
2063	50 4,750	1,382
2064	51 4,500	1,277
2065	52 4,750	1,315
2066	53 4,750	1,283
2077	64 10,000	2,059
2078	65 7,000	1,406
2081	68 8,250	1,539
2082	69 8,250	1,501
2079	66 5,000	980
2080	67 7,500	1,434
2083	70 9,500	1,687
2084	71 9,000	1,559
2085	72 9,500	1,605
2086	73 9,500	1,566
2091	78 21,662	3,157
		<b>110,773</b>
		<b>27,903</b>
		<b>3,157</b>
		<b>135,520</b>

E-M1	
E-M2	
E-M5-1	Major Rehab/Reface
E-M5-2	Major Rehab/Reface
E-M5-3	Major Rehab/Reface
E-M5-4	Major Rehab/Reface
E-M5-5	Major Rehab/Reface
E-M5-6	Major Rehab/Reface
E-M5-7	Major Rehab/Reface
E-M5-8	Major Rehab/Reface
E-M5-9	Major Rehab/Reface
E-M5-10	Major Rehab/Reface
E-M5-1	Patch/Reseal
E-M5-2	Patch/Reseal
E-M5-3	Patch/Reseal
E-M5-4	Patch/Reseal
E-M5-5	Patch/Reseal
E-M5-6	Patch/Reseal
E-M5-7	Patch/Reseal
E-M5-8	Patch/Reseal
E-M5-9	Patch/Reseal
E-M5-10	Patch/Reseal
E-M5-1	Patch/Reseal
E-M5-2	Patch/Reseal
E-M5-3	Patch/Reseal
E-M5-4	Patch/Reseal
E-M5-5	Patch/Reseal
E-M5-6	Patch/Reseal
E-M5-7	Patch/Reseal
E-M5-8	Patch/Reseal
E-M5-9	Patch/Reseal
E-M5-10	Patch/Reseal
End of life of structure (Residual Value)	
Total Present Value for Capital Construction Cost	
Total Present Value for General Maintenance	
Present Value for Residual Value	
Net Present Value	

**Present Value Analysis**

**Steel Coating**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2029	16 8,000	5,389
2030	17 16,000	10,515
2031	18 10,000	6,412
2059	46 8,000	2,569
2060	47 16,000	5,013
2061	48 10,000	3,057
2089	76 8,000	1,225
2090	77 16,000	2,390
2091	78 12,174	1,774
		<b>22,316</b>
		<b>14,254</b>
		<b>1,774</b>
		<b>34,795</b>

E-M6-1	
E-M6-2	
E-M6-3	
E-M6-1	
E-M6-2	
E-M6-3	
E-M6-1	
E-M6-2	
End of life of structure (Residual Value)	
Total Present Value for Capital Construction Cost	
Total Present Value for General Maintenance	
Present Value for Residual Value	
Net Present Value	

**Residual Value**

	Target Year	Next Repl. Y	Rem. Life	Cap. Cost	Value at Target Year	Difference
E-M6-1	2091	2119	28	8,000	4,007	3,993
E-M6-2	2091	2120	29	16,000	7,819	8,181
E-M6-3	2091	2091	0	10,000	10,000	0
(Residual Value at Target Year)						12,174

**Life Cycle Cost in 2013 dollars**

**92,000** \$ (1000s)

**Summary of Present Value Analysis - Accelerated Construction - II**

1) Present Value for Capital Construction and General Maintenance

- A = Total Present Value for Capital Construction Cost (\$ 1000s)
- B = Total Present Value for General Maintenance defined in Section 4.1.5 of the report (\$ 1000s)
- C = Present Value for Residual Value (\$ 1000s)
- D = Net Present Value (\$ 1000s)

## Accelerated Construction - II

Contract	Present Value			
	A	B	C	D
E1	100,351	5,864	1,142	105,073
E-A1	225,971	10,459	3,310	233,119
E-A2	238,806	14,546	7,057	246,295
E2	74,553	5,952	2,794	77,710
E3	5,193	569	287	5,475
E4	17,337	1,872	1,141	18,068
E5	5,182	567	377	5,372
E6	6,389	701	504	6,586
E7	57,876	2,674	5,843	54,708
E8	42,243	1,935	4,875	39,303
#341 ~ East Abut.	9,810	1,797	2,313	9,294
"Ps" & "Pn"	12,238	1,857	2,188	11,908
Bent Repair	110,773	27,903	3,157	135,520
Steel Coating	11,801	6,851	582	18,069
<b>Total</b>	<b>918,523</b>	<b>83,547</b>	<b>35,570</b>	<b>966,500</b>

2) Present Value for Miscellaneous Maintenance

(Miscellaneous Maintenance defined in Section 4.1.5 of the report)  
**90,830** (\$ 1000s)

3) Summary of Present Values

- Present Value for Capital Construction = \$919 M
- Present Value for Maintenance = \$174 M
- Present Value for Residual Value = \$36 M
- **Net Present Value = \$1,057 M**

4) Life Cycle Cost by year 2091 in 2013 dollars

**\$1,740 M**

**Present Value Analysis**

**Section E-A0**

Base Year **2013**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2017	4 56,068	50,795
2018	5 56,068	49,556
2033	20 1,009	616
2048	35 1,009	425
2048	35 6,953	2,930
2063	50 1,009	294
2078	65 1,009	203
2078	65 6,953	1,397
2091	78 7,835	1,142

100,351  
5,864  
1,142  
**105,073**

Year 2 Construction (E)
Year 3 Construction (E)
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
Mill, Repave, Replace joint seal
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing
End of life of structure (Residual Value)

Total Present Value for Capital Construction Cost  
Total Present Value for General Maintenance  
Present Value for Residual Value  
Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2093	2108	2093
Remaining Life (Year)	2	17	2
Capital Cost	1,009	6,953	112,136
Value at Target Year	960	4,569	106,733
Differential Value	49	2,384	5,403
(Residual Value at Target Year)			<b>7,835</b>

**Life Cycle Cost in 2013 dollars**

130,078 \$ (1000s)

**Present Value Analysis**

**Section E-A1**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2017	4 84,132	76,219
2018	5 833	736
2018	5 84,132	74,360
2018	5 2,385	2,108
2019	6 84,132	72,547
2034	21 1,844	1,098
2049	36 1,844	758
2049	36 12,713	5,226
2064	51 1,844	523
2079	66 1,844	361
2079	66 12,713	2,492
2091	78 22,715	3,310

225,971  
10,459  
3,310  
**233,119**

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2094	2109	2094
Remaining Life (Year)	3	18	3
Capital Cost	1,844	12,713	252,396
Value at Target Year	1,712	8,151	234,375
Differential Value	132	4,562	18,021
(Residual Value at Target Year)			<b>22,715</b>

**Life Cycle Cost in 2013 dollars**

288,416 \$ (1000s)

Year 1 Construction (E)
Year 1 Construction (E)
Year 2 Construction (E)
E-M3 included for analysis
Year 3 Construction (E)
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
Mill, Repave, Replace joint seal
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing
End of life of structure (Residual Value)

Total Present Value for Capital Construction Cost  
Total Present Value for General Maintenance  
Present Value for Residual Value  
Net Present Value



**Present Value Analysis**

**Section E-A2**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2021	8 97,655	80,150
2021	8 379	311
2021	8 97,655	80,150
2022	9 97,655	78,195
2037	24 2,762	1,527
2052	39 2,762	1,054
2052	39 19,041	7,269
2067	54 2,762	728
2082	69 2,762	503
2082	69 19,041	3,465
2091	78 48,427	7,057
		<b>238,806</b>
		<b>14,546</b>
		<b>7,057</b>
		<b>246,295</b>

Year 1 Construction (E)
Interim Repair
Year 1 Construction (E)
Year 3 Construction (E)
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
Mill, Repave, Replace joint seal
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing
End of life of structure (Residual Value)
Total Present Value for Capital Construction Cost
Total Present Value for General Maintenance
Present Value for Residual Value
Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2097	2112	2097
Remaining Life (Year)	6	21	6
Capital Cost	2,762	19,041	292,965
Value at Target Year	2,382	11,337	252,623
Differential Value	380	7,704	40,342
(Residual Value at Target Year)			<b>48,427</b>

**Life Cycle Cost in 2013 dollars**

**342,474** \$ (1000s)

**Present Value Analysis**

**Section E2**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2023	10 28,266	22,081
2023	10 4,333	3,385
2024	11 28,267	21,544
2024	11 4,333	3,302
2025	12 28,267	21,018
2025	12 4,334	3,223
2040	27 694	356
2055	42 694	246
2055	42 4,783	1,696
2055	42 3,250	1,152
2070	57 694	170
2075	62 6,500	1,406
2085	72 694	117
2085	72 4,783	808
2091	78 19,175	2,794

Year 1 Construction (E)
Bent Repair
Year 2 Construction (E)
Bent Repair
Year 3 Construction (E)
Bent Repair (B)
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
Bent Repair
Mill, Repave, Replace joint seal
Bent Repair
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing
End of life of structure (Residual Value)

**74,553**

**5,952**

**2,794**

**77,710**

Total Present Value for Capital Construction Cost
Total Present Value for General Maintenance
Present Value for Residual Value
Net Present Value

**Residual Value**

Type of work	A	B	C	E
Target Year	2091	2,091	2091	2091
Next Replacement Year	2100	2,091	2115	2100
Remaining Life (Year)	9	0	24	9
Capital Cost	694	13,000	4,783	84,800
Value at Target Year	556	13,000	2,644	67,902
Differential Value	138	0	2,139	16,898
(Residual Value at Target Year)				<b>19,175</b>

**Life Cycle Cost in 2013 dollars**

**119,892** \$ (1000s)

**Present Value Analysis**

**Section E3**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2026	13	7,159
2041	28	119
2056	43	119
2056	43	823
2071	58	119
2086	73	119
2086	73	823
2091	78	1,972

Year 1 Construction (E)	
Mill, Repave, Replace joint seal (A)	
Mill, Repave, Replace joint seal	
New Pavement, E.J. and Waterproofing (C)	
Mill, Repave, Replace joint seal	
Mill, Repave, Replace joint seal	
New Pavement, E.J. and Waterproofing (C)	
End of life of structure (Residual Value)	

5,193  
569  
287  
**5,475**

Total Present Value for Capital Construction Cost  
Total Present Value for General Maintenance  
Present Value for Residual Value  
Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2101	2116	2101
Remaining Life (Year)	10	25	10
Capital Cost	119	823	7,159
Value at Target Year	93	444	5,593
Differential Value	26	379	1,566
(Residual Value at Target Year)			<b>1,972</b>

**Life Cycle Cost in 2013 dollars**

9,281 \$ (1000s)

**Present Value Analysis**

**Section E4**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2027	14	15,366
2028	15	9,359
2043	30	412
2058	45	412
2058	45	2,843
2073	60	412
2088	75	412
2088	75	2,843
2091	78	7,830

Year 1 Construction (E)	
Year 2 Construction (E)	
Mill, Repave, Replace joint seal (A)	
Mill, Repave, Replace joint seal	
New Pavement, E.J. and Waterproofing (C)	
Mill, Repave, Replace joint seal	
Mill, Repave, Replace joint seal	
New Pavement, E.J. and Waterproofing (C)	
End of life of structure (Residual Value)	

17,337  
1,872  
1,141  
**18,068**

Total Present Value for Capital Construction Cost  
Total Present Value for General Maintenance  
Present Value for Residual Value  
Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2103	2118	2103
Remaining Life (Year)	12	27	12
Capital Cost	412	2,843	24,725
Value at Target Year	306	1,460	18,384
Differential Value	106	1,383	6,341
(Residual Value at Target Year)			<b>7,830</b>

**Life Cycle Cost in 2013 dollars**

32,059 \$ (1000s)

**Present Value Analysis**

**Section E5**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2029	16	7,693
2044	31	128
2059	46	128
2059	46	883
2074	61	128
2089	76	128
2089	76	883
2091	78	2,588

Year 1 Construction (E)
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
Mill, Repave, Replace joint seal
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
End of life of structure (Residual Value)

5,182  
567  
377  
**5,372**

Total Present Value for Capital Construction Cost  
Total Present Value for General Maintenance  
Present Value for Residual Value  
Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2104	2119	2104
Remaining Life (Year)	13	28	13
Capital Cost	128	883	7,693
Value at Target Year	93	442	5,581
Differential Value	35	441	2,112
(Residual Value at Target Year)			<b>2,588</b>

**Life Cycle Cost in 2013 dollars**

9,971 \$ (1000s)

**Present Value Analysis**

**Section E6**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2030	17	9,722
2045	32	162
2060	47	162
2060	47	1,118
2075	62	162
2090	77	162
2090	77	1,118
2091	78	3,461

Year 1 Construction (E)
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
Mill, Repave, Replace joint seal
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
End of life of structure (Residual Value)

6,389  
74  
51  
350  
35  
24  
167  
504  
6,389  
701  
504  
**6,586**

Total Present Value for Capital Construction Cost  
Total Present Value for General Maintenance  
Present Value for Residual Value  
Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2105	2120	2105
Remaining Life (Year)	14	29	14
Capital Cost	162	1,118	9,722
Value at Target Year	115	546	6,881
Differential Value	47	572	2,841
(Residual Value at Target Year)			<b>3,461</b>

**Life Cycle Cost in 2013 dollars**

12,606 \$ (1000s)

**Present Value Analysis**

**Section E7**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2035	22 62,986	36,586
2036	23 37,568	21,290
2051	38 987	386
2066	53 987	267
2066	53 6,801	1,837
2081	68 987	184
2091	78 40,093	5,843

Year 1 Construction (E)
Year 2 Construction (E)
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
Mill, Repave, Replace joint seal
End of life of structure (Residual Value)

57,876  
2,674  
5,843  
**54,708**

Total Present Value for Capital Construction Cost  
Total Present Value for General Maintenance  
Present Value for Residual Value  
Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2096	2096	2111
Remaining Life (Year)	5	5	20
Capital Cost	987	6,801	100,554
Value at Target Year	872	6,011	61,365
Differential Value	115	790	39,189
(Residual Value at Target Year)			<b>40,093</b>

**Life Cycle Cost in 2013 dollars**

110,316 \$ (1000s)

**Present Value Analysis**

**Section E8**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2037	24 29,611	16,371
2038	25 47,964	25,871
2053	40 750	279
2068	55 750	193
2068	55 5,172	1,330
2083	70 750	133
2091	78 33,454	4,875

Year 1 Construction (E)
Year 2 Construction (E)
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
Mill, Repave, Replace joint seal
End of life of structure (Residual Value)

42,243  
1,935  
4,875  
**39,303**

Total Present Value for Capital Construction Cost  
Total Present Value for General Maintenance  
Present Value for Residual Value  
Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2091	2091	2091
Next Replacement Year	2098	2098	2113
Remaining Life (Year)	7	7	22
Capital Cost	750	5,172	77,575
Value at Target Year	631	4,351	45,061
Differential Value	119	821	32,514
(Residual Value at Target Year)			<b>33,454</b>

**Life Cycle Cost in 2013 dollars**

84,997 \$ (1000s)

**Present Value Analysis**

**Bent #341 - East Abutment**

Year	Cost \$ (1000s)	PV \$ (1000s)
2002		
2013	0	
2020	7	252
2035	22	252
2035	22	1,738
2052	39	25,698
2067	54	252
2082	69	252
2082	69	1,738
2091	78	15,872

Deck Replacement
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing (C)
Deck Replacement (E)
Mill, Repave, Replace joint seal
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing
End of life of structure (Residual Value)

Total Present Value for Capital Construction Cost  
 Total Present Value for General Maintenance  
 Present Value for Residual Value  
 Net Present Value

9,810  
 1,797  
 2,313  
**9,294**

**Residual Value**

Type of work	A	C	E
Target Year	2,091	2,091	2,091
Next Replacement Year	2,097	2,112	2,127
Remaining Life (Year)	6	21	36
Capital Cost	252	1,738	25,698
Value at Target Year	217	1,035	10,564
Differential Value	35	703	15,134
(Residual Value at Target Year)			<b>15,872</b>

**Life Cycle Cost in 2013 dollars**

**30,182** \$ (1000s)

**Present Value Analysis**

**Ramps "Ps" & "Pn"**

Year	Cost \$ (1000s)	PV \$ (1000s)
1994		
2013	0	
2024	11	1,772
2046	33	27,645
2061	48	257
2076	63	257
2076	63	1,772
2091	78	15,014

Deck Replacement
New Pavement, E.J. and Waterproofing (C)
Deck Replacement (E)
Mill, Repave, Replace joint seal (A)
Mill, Repave, Replace joint seal
New Pavement, E.J. and Waterproofing
End of life of structure (Residual Value)

12,238  
 1,857  
 2,188  
**11,908**

Total Present Value for Capital Construction Cost  
 Total Present Value for General Maintenance  
 Present Value for Residual Value  
 Net Present Value

**Residual Value**

Type of work	A	C	E
Target Year	2,091	2,091	2,091
Next Replacement Year	2,091	2,106	2,121
Remaining Life (Year)	0	15	30
Capital Cost	257	1,772	27,645
Value at Target Year	257	1,224	13,179
Differential Value	0	548	14,465
(Residual Value at Target Year)			<b>15,014</b>

**Life Cycle Cost in 2013 dollars**

**31,703** \$ (1000s)

**Present Value Analysis**

**Bent Repair**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2015	2,393	3,743
2016	3,172	1,598
2027	14,20,000	14,155
2028	15,14,000	9,667
2031	18,16,500	10,579
2032	19,16,500	10,321
2029	16,10,000	6,736
2030	17,15,000	9,858
2033	20,19,000	11,595
2034	21,18,000	10,717
2035	22,19,000	11,036
2036	23,19,000	10,767
2057	44,5,000	1,687
2058	45,3,500	1,152
2061	48,4,125	1,261
2062	49,4,125	1,230
2059	46,2,500	803
2060	47,3,750	1,175
2063	50,4,750	1,382
2064	51,4,500	1,277
2065	52,4,750	1,315
2066	53,4,750	1,283
2077	64,10,000	2,059
2078	65,7,000	1,406
2081	68,8,250	1,539
2082	69,8,250	1,501
2079	66,5,000	980
2080	67,7,500	1,434
2083	70,9,500	1,687
2084	71,9,000	1,559
2085	72,9,500	1,605
2086	73,9,500	1,566
2091	78,21,662	3,157

110,773  
27,903  
3,157  
**135,520**

E-M1	
E-M2	
E-M5-1	Major Rehab/Reface
E-M5-2	Major Rehab/Reface
E-M5-3	Major Rehab/Reface
E-M5-4	Major Rehab/Reface
E-M5-5	Major Rehab/Reface
E-M5-6	Major Rehab/Reface
E-M5-7	Major Rehab/Reface
E-M5-8	Major Rehab/Reface
E-M5-9	Major Rehab/Reface
E-M5-10	Major Rehab/Reface
E-M5-1	Patch/Reseal
E-M5-2	Patch/Reseal
E-M5-3	Patch/Reseal
E-M5-4	Patch/Reseal
E-M5-5	Patch/Reseal
E-M5-6	Patch/Reseal
E-M5-7	Patch/Reseal
E-M5-8	Patch/Reseal
E-M5-9	Patch/Reseal
E-M5-10	Patch/Reseal
E-M5-1	Patch/Reseal
E-M5-2	Patch/Reseal
E-M5-3	Patch/Reseal
E-M5-4	Patch/Reseal
E-M5-5	Patch/Reseal
E-M5-6	Patch/Reseal
E-M5-7	Patch/Reseal
E-M5-8	Patch/Reseal
E-M5-9	Patch/Reseal
E-M5-10	Patch/Reseal
End of life of structure (Residual Value)	

Total Present Value for Capital Construction Cost  
Total Present Value for General Maintenance  
Present Value for Residual Value  
Net Present Value

**Present Value Analysis**

**Steel Coating**

Year	Cost \$ (1000s)	PV \$ (1000s)
2013	0	
2029	16,8,000	5,389
2031	18,10,000	6,412
2059	46,8,000	2,569
2061	48,10,000	3,057
2089	76,8,000	1,225
2091	78,3,993	582
		11,801
		6,851
		582
		<b>18,069</b>

E-M6-1  
E-M6-2  
E-M6-1  
E-M6-2  
E-M6-1  
End of life of structure (Residual Value)  
Total Present Value for Capital Construction Cost  
Total Present Value for General Maintenance  
Present Value for Residual Value  
Net Present Value

**Residual Value**

	Target Year	Next Repl. Y	Rem. Life	Cap. Cost	Value at Target Year	Difference
E-M6-1	2091	2119	28	8,000	4,007	3,993
E-M6-2	2091	2091	0	10,000	10,000	0
					(Residual Value at Target Year)	3,993

**Life Cycle Cost in 2013 dollars**

44,000 \$ (1000s)