

BOARD OF SUPERVISORS AGENDA ITEM REPORT CONTRACTS / AWARDS / GRANTS

Requested Board Meeting Date: September 6, 2016

or Procurement Director Award

Contractor/Vendor Name (DBA): HDR Engineering, Inc.

Project Title/Description:

Countywide Culvert Load Rating Project.

Purpose:

Amendment of Award: Contract No. CT-TR-15-349, Amendment No. Two (2). This amendment increases the not-to-exceed amount from \$699,208.00 to \$774,953.00. The additional scope of work addresses changes to the number and type of culverts being load rated. Administrating Department: Transportation

Procurement Method:

Subsequent to Solicitation For Qualifications No. 151476, on November 4, 2014, the Board of Supervisors awarded a contract for this project not to exceed \$699,208.00 for a contract term of February 20, 2015 to June 19, 2016. Previous Amendment No. One (1) extended the contract termination date to December 31, 2016.

Attachment: Amendment No. Two (2)

Program Goals/Predicted Outcomes:

The goal is to obtain and review plans for culverts to be load rated to assess the existing condition of culverts on the load rating list; perform field assessments as needed for those culverts which may indicate a significant level of deterioration from the original condition.

Public Benefit:

The public benefit is that the Department of Transportation will be able to identify the culverts whose deteriorating conditions will need to be addressed to protect the traveling public.

Metrics Available to Measure Performance:

The consultant will complete the load rating testing and inspections on all identified culverts.

Retroactive:

No

Procure Jept 08/12/16 PM02:45

To: CoB- 8-15-16 (1)
Pgs. 18

Original Information					
Document Type:	Department Code:		Contract	Num	ber (i.e.,15-123):
Effective Date:	Termination Date:				er (Synergen/CMS):
Expense Amount: \$		Reve	nue Am	ount:	\$
Funding Source(s):	+ 4				
Cost to Pima County G	eneral Fund: \$				
Contract is fully or parti	ally funded with Federal Funds?	☐ Yes	☐ No		Not Applicable to Grant Awards
Were insurance or inde	emnity clauses modified?	☐ Yes	☐ No		Not Applicable to Grant Awards
Vendor is using a Socia	al Security Number?	☐ Yes	☐ No		Not Applicable to Grant Awards
If Yes, attach the requi	red form per Administrative Proced	lure 22-73	3.		
Amendment Informat	ion				
Document Type: CT	Department Code: TR		Contract	Num	nber (i.e.,15-123): 15-349
Amendment No.: Two (2)	AI	MS Versi	ion N	o.: Six (6)
Effective Date: Septem	ber 6, 2016	New 1	Ferminat	ion D	date:
	nue Increase Decrease			This	Amendment: \$75,745.00
	General Fund:				
C	B		76.		8-8-16
Contact: Anthony V. S		R L	a good	<u> </u>	
Department: Procurem		18	-3-10	'	Telephone: 724-3245
Department Director S			111-	~	1 - St. 1 - X191
	strator Signature/Date:	A LA	1	~	8/1/16
County Administrator S (Required for Board Agenda				æ	recup sprzy

PIMA COUNTY DEPARTMENT OF TRANSPORTATION

PROJECT:

COUNTYWIDE CULVERT LOAD RATING

PROJECT

CONSULTANT: HDR Engineering, Inc.

1 S. Church Avenue, Suite 625

Tucson, AZ 85701

CONTRACT NO.:

CT-TR-15-349

AMENDMENT NO.: Two (2)

FUNDING:

Federal Funds (FHWA) 89%,

County HURF 11%

CONTRACT TERM: 02/20/2015 to 06/19/2016 **TERMINATION PRIOR AMENDMENT: 12/31/16**

TERMINATION THIS AMENDMENT: 12/31/2016

ORIGINAL CONTRACT AMOUNT: \$ 699,208.00

This number must appear

PRIOR AMENDMENT(S):

AMOUNT THIS AMENDMENT:

\$ 75,745.00 \$

CONTRACT

CT-TR-15-349

correspondence

pertaining

REVISED CONTRACT AMOUNT:

invoices.

contract.

documents

774,953.00 \$

and this

CONTRACT AMENDMENT

WHEREAS, COUNTY and CONSULTANT have entered into the Contract referenced above; and

WHEREAS, upon reviewing the as-built plans, several culverts have been identified with more complex geometry beyond what was initially scoped; and

WHEREAS, COUNTY requires additional services for the comprehensive load rating of all Corrugated Metal Pipes (CMPs) and Reinforced Concrete Pipes (RCPs) culverts; and

WHEREAS, CONSULTANT agreed to perform the additional services at a price that was reviewed and accepted by COUNTY.

NOW, THEREFORE, it is agreed as follows:

CHANGE: ARTICLE II - SCOPE, first paragraph as follows:

From: CONSULTANT agrees to provide Countywide Culvert Load Rating services for the COUNTY as described in EXHIBIT 'A' - SCOPE OF WORK (11 pages) an attachment to this Contract.

To: CONSULTANT agrees to provide Countywide Culvert Load Rating services for the COUNTY as described in EXHIBIT 'A' - SCOPE OF WORK (11 pages) and EXHIBIT 'A-1' - SCOPE OF WORK (MODIFICATION 1 AND 2) (11 pages) attachments to this Contract.

ADD the attached EXHIBIT 'A-1' - SCOPE OF WORK (MODIFICATION 1 AND 2) (11 pages) to the contract.

CHANGE: ARTICLE III - COMPENSATION AND PAYMENT, first paragraph as follows:

From: In consideration of the services specified in this Contract, the COUNTY agrees to pay CONSULTANT as follows: Not To Exceed Six Hundred Ninety-Nine Thousand. Two Hundred Eight Dollars (\$699,208.00). CONSULTANT'S fees and method of compensation shall be based on an Hourty Not to Exceed Basis or other method mutually agreeable to both Parties at the time services are requested in accordance with provisions described in EXHIBIT 'B': CONSULTANT FEE SCHEDULE (5 pages), an attachment to this Contract.

In consideration of the services specified in this Contract, the COUNTY agrees to pay CONSULTANT as follows: Not To Exceed Seven Hundred Seventy-four Thousand, Nine Hundred Fifty-three Dollars (\$774,953.00). CONSULTANT'S fees and method of compensation shall be based on an Hourly Not to Exceed Basis or other method mutually agreeable to both Parties at the time services are requested in accordance with provisions described in EXHIBIT 'B': CONSULTANT FEE SCHEDULE (3 pages), and EXHIBIT 'B-1': CONSULTANT FEE SCHEDULE (SCOPE MODIFICATION 1 AND 2) (5 pages) attachments to this Contract.

ADD the attached EXHIBIT 'B-1': CONSULTANT FEE SCHEDULE (SCOPE MODIFICATION 1 AND 2) (5 pages) to the Contract.

This Amendment shall be effective on September 6, 2016.

All other provisions of the Contract, not specifically changed by this amendment, shall remain in effect and be binding upon the Parties.

PIMA COUNTY:

Consultant:

Chair, Board of Supervisors

Chair, Board of Supervisors

Chair, Board of Supervisors

Chair, Board of Supervisors

Signature

Name and Title (Please Print)

Syll / 2016

Date

APPROVED AS TO FORM

Deputy County Attorn ey

ANDREW FLAGG

2016

Name (Please Print)

Date

COUNTYWIDE CULVERT LOAD RATING PROJECT FEDERAL AID PROJECT NO. HBP PPM-0(249)D ADOT TRACS NO. SB463 01D

PROPOSAL for Contract Modification #1

HDR Engineering, Inc. July 20, 2016

CONTRACT MODIFICATION #1

This document is intended to provide the basis for proposed changes to the scope of work and fee for the County-wide Culvert Load Rating Project that was originally submitted in February, 2015. During the course of work on the project, there have been changes to anticipated work, type, and number of culverts load rated. Changes to the scope of work are as follows:

Task 1.0 Project Administration: No Changes.

Task 2.0 Meetings: No Changes.

Task 3.0 Review Existing Structure Information: No Changes

Task 4.0 Field Activities: No Changes.

- **Task 5.0 Structure Load Ratings:** Over the course of the project, there have been several changes to the type of culvert being rated, addition and removal of other culverts due to discovery of culverts or annexation of culverts by other agencies, and changes in analysis requirements for certain culvert types.
 - 5.1 Load Ratings for Reinforced Concrete Box Culverts: During the course of the work, some culverts were added and some were removed from Pima County's inventory. Additionally, it was discovered that some culverts on the inventory list used for scoping were mislabeled as Reinforced Concrete Box Culverts (RCBC) but were actually pipes or arches. The original number of culverts to be rated was 114. This total number has since been reduced to 111 total culverts. Therefore, the total budget for this task is proposed to be recluced by an amount equivalent to the reduction of three RCBCs reclured for back rating.
 - 5.2 Load Ratings for Reinforced Concrete Arches: During the course of the work, it was discovered that several Reinforced Concrete Arches (RCA) were mislabeled as RCBC's. The original number of RCA's anticipated in the scope of work was 13 total arches. This number has since been revised to 15 arch structures. Additionally, the initial scope of work was based on the understanding that the arches were single span arches. During review of the as-built plans provided by Pima County, it was noted that seven of the arches to be analyzed consisted of multiple arches that require additional analysis due to framing (interior arch versus exterior arch) or due to varying arch radii or height. Therefore, the total

COUNTYWIDE CULVERT LOAD RATING PROJECT FEDERAL AID PROJECT NO. HBP PPM-0(249)D ADOT TRACS NO. SB463 01D

budget for this task is proposed to be increased by an amount equivalent to the addition of nine arches required to be analyzed for load rating.

5.3 Load Ratings for Steel Plate Arches: During the review of as-built plans provided by Pima County, it was noted that one of the Steel Plate Arches (SPA) had two differing arch spans and heights. This requires an additional analysis of this alternative span arrangement. Therefore, the total budget for this task is proposed to be increased by an amount equivalent to the addition of the extra arch span required to be analyzed for load rating.

Task 6.0 Load Rating Reports: No Changes.

Task 7.0 Load Rating Summary List: No Changes.

Task 8.0 Load Posting Summary List: No Changes.

Task 9.0 Additional Services: As we near completion of the project, the need for additional services is better known. As the scope of these required services is better defined, it is proposed that funds currently under this task be used for the proposed changes listed above. Task 9.1 – Non-Destructive Testing (NDT) and Limited Destructive Testing (LDT) have not been required for this project and are currently not anticipated to be required. Task 9.3 – Additional Work has likewise not been required up to this point. Therefore, because there is sufficient funds originally listed under Tasks 9.1 and 9.3 to cover the changes to tasks 5.1 through 5.3 noted above, it is proposed that these available funds be used for the proposed changes to scope.

EXHIBIT A CULVERT INVENTORY LIST

Pfma_County_Culverts February 2, 2015

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Plms_County_Culverts

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Marie Marie Marie	Small Wash RCB	Paio Verde Road	Small Wash	0.1 mi S of Alo Way	1956	4		17470 5		0 A	2	19	4	10	43 N	6	3	16 3	38 8	5	0) (5	106	100	B 1		98.89 /
BATTERS THE	Medium West RCB	Paio Verde Road	Medium Wash RCB	0.5 mi S of Alo Way	1956	4		17470 5		30 A	2	19	4	12	51 N	6	3	16 3	36 6	5	0) (5	74	L 8:	5 1		97.87
NOT ASSOCIATE	Julian Wash Culvert	Palo Verde Road	Julian Wash	0.18 S of Irvington	1966	4		28000 0		15 A	2	19	6	10	88 N	6	3	8 3	36 6	5	0) (10	BE	8 8	9 1		92.65
CH TOTAL PIE	Small Wash RCB	Palo Verde Rd	Small Wash	Drexel @ Palo Verde	1958	4		29600 5		30 A	2	19	3	12	39 N	6	3	16 3	36 6	5	0	1 (1 4	78	9	0 1	F	90.67
DE SEAS OF	Subdiv Drain HCII	La Carada Drive	Subdivision Drainway	200' N-Roller Coastr	1971	4		17150 5		OA	2	19	3	10	32 N	6	3	6 3	36 6	5	0		5	76	7	8 1		92.67
1500,734	Pegler Wash RCB	Orange Grove Rd	Pegler Wash	1300 ft W of La Cholla	1972	- 2	2 0	12000 0		0 A	2	19	4	12	53 N	6	3	16 3	36 6	5	0) () 8	44	4	4 3)	96,07
	Casa Adobes Wash FICE	Orange Grove Rd	Casa Adobes Wash	300 ft W of La Canada Dr	1972	- 2	2 0	14000 0		30 A	2	19	3	11	37 N	6	3	16 3	36 6	5	0) (9	44	5	1 3	1	94.90
ALC: UNK	Small Wash Culvert	Alvernon Way	Small Wash	0.2 ml S Los Reales	1962	2	2 0	6000 5		0 A	2	19	2	10	22 N	Ð	3	16 3	36 6	5	0	1 2	4	44	4	4 1	F	85.19
- 100 M	Small Wash RCB	Alvemon Way	Small Wash	0.6 ml S Los Reales	1956	2	2 0	8600 5		0 A	2	19	4	10	43 N	6	3	16 3	36 6	5	0	1	5	44	4	4 2		88.98
and the last of th	Small Wash RCB	Alvemon Way	Small Wash	1.3 ml S Los Reales	1956	2	2 0	7900 5		0 A	2	19	8	10	64 N	6	3	16 3	36 6	5	0) 2	4	44	4	8 1		85.54
100	Willroughter Chris FSCIA	Ajo Way	Interceptor Chargest	9.25 ms West Part Verde	1977	- 1		161(0) 5		84	2	15-		40	43 N		- 3	6 3	34.6	5	D			128	1 12			198.79
OR NOW YES	Dried Steel, FEB.	Managinary	Smill Wall	SEM SECULIA	1			780 5		DE A	100	100	-	STATE OF		*	- 3		46			1000	STATE OF THE PARTY.	- M				E41
CANCEL THE	Barrier Wart William	Region Floor	Street Water	SOM WWW III				780 5		21		100	-	100	_				-		- 0		-	<u> </u>	-	31		89.21
ICE NAME NAME	Pagier Wash RCE	Ins Road	Pegler Wash	E.4 ms East of La Cholin	7660	- 0		344(0) 5		EA	2	100	- 4	110	43 N	. 7	- 2	6 2	87.	5	D		- 1	120	51	5 1		75.73
THE REAL PROPERTY.	Namini Wash RCB	ina Fload	Naviro Wash	300 # E La Canada Dr	1960	4		3500 5		27 A	2	14.00	3	9	30 N	8			36 8	5	0	1	- 5	110				95.72
PERSONAL PROPERTY.	Drawingoway RCB	Visionola Pland	Drainagewen	450' E Carn De La Tiorra	1981	4		13990 5		45 A	2	19	2	14	30 N	8	3		36 6	5	0		5	120	17	0 1		93.93
THE NAME AND	Drawageway RCB	Valerata Float	Distriction	1700' E Cam De La Tierra	1981	4		MF121 5			2	19	2	10	23 N	7			36 7	5	0		5	120		0 1		94.34
and load rec	Nareni Wash FICB	Le Garactic Drive	Norici Wasts	200' South of Ina Basel	7981	- 4		13700-5		20 A	1	19	3	- 11	35 N				an in		- 1			35				97.97
BE REAL PROPERTY.	District No.	Street Ford	Scraff WACK	9 1 M SW 1 19	hee	3		1855		- 44	•	-	-	10	av.w	-	-	Name of Street	67	-	100	and the last	20000	22		and the last	-	P6.00
-	Small Wash NCD	Le Carecte Drive	Snull Wash	350 ft South El Napel	1991			4500-5	1	34 A	2	18.	2		28 N	7			36.7	5.	- 0		- 5	- 14	15	1		393.51
M 100. 10	Modium Wash Piczs	Valencia Risad	Medium Wash	200 ft East Cardinal Ave.	1983	4					2	19	7	10	107 N	6	3		36 6	5	0		6	129				74.71
ATT MORE THE	Medium Wast-RCB	Le Carecta Orive	Medium Wash	0.5 mi N Experterate Bivd	1982	4	. 0				2	19	4	10	43 N	7			36 7	5	ō		9	104				96.62
OF REAL PROPERTY.	Carmack Wash RCB	More Lisa Fload	Carmack Wash	6.25 mi N Ina Road	1987	3	3 0				2	19	7	10	77 N	6	3		36 6	5	0		. 8	80		R 2		90.00
OF REAL PROPERTY.	Medium Wash RCB	Kirmey Road	Medium Wash	400 R N Western Way	1987	2					2	19	4	10	44 N	7			36 7	5	0		4	86	81	9 1		100.00
100.00	Carryack Wash RCB	Camiro Del Tierra	Carriade Wast FICE	0.25 se N Orange Grove Rd	1987	- 1				13 A	7	19	8	8	FD M	5			16.5	4	- 6	. 7	. 4	- 00				25.18
STATE OF		La Carvecta Dition	MINDS WANT	THE REAL PROPERTY AND THE	THE REAL PROPERTY.	-		0000 5		0.6	•	10		-	124200				M.C.	-	-	Contract of	THE REAL PROPERTY.	124		Marie S		95.00
ALC: NO	Large Wash RCB	La Canada Drive	Large Wash	0.7 m S Expension third	1986			11920 6		13 A	2	19	- 1	12	53 N	0		4 2	36.6	5	- 0		- 10	1118	120	2 2		120.06
OR RESERVE		Section Dec	Ministra Walson	D 17 on N CONTRACT RE	or speed	-		#1901S		ASA	2	10	_	COMMO	180.04	•	-			•				- 00	57			30,80
200	Smit Wast RCS	Wa Entrade	Service Waters	Via Ermode at River Read	1995		-	250-5	_		2	15	- 2	10	23 N	7	- 3		ME F.	5	0		· 5	. 68				95.96
	Campbell Wash RCB	Campbell Airense	Carrobell Wast:	500 ti N of River Road	1985	- 3		11700 5		40 A	7	19	5		81.74			e : :	10.6	3	0			83			-	199,00
400	Charge of Page Pice	(New Property	CARROLL MARKETON	300 0 W Convinti Name	1100	-		1	_	5.8	-	19	_	7.0	40 N	7			14.7	èmo	-	-	and the last	the same of		-		200.00
THE PERSON NAMED	Via Entrada Wash PICS	Fliver Float2	Via Entrado Wash	100 h W Via Entrada	1985			22300 5	-	EA.	2	19	- 4		30 N	B.	-	6 1	W E	E	- 0			- 04	- 1			100.00
	Medium Wash RCB	Mission Rid.	Medium Wanh	0.5 mi N Twin Buttes Rd	1994		2 0	03		0 A	2	19	5	10	57 N	7			36 7	5	0) 1	0 0		100.00
NAV SHOW YOU	Geronmo Wash RCB	First Avenue	Geronimo Wash	200' south Orange Grove	2002	4					2	19	3	0	0 N	6			36 6	5	0		0	0) 3		83.00
W 100 40	Xaver Wash RCB	Nogales Hwy	Xevier Wash	7.0 ml S Jct SR 86	1949	2	2 0				2	19	6	10	84 N	7			36 7	5	11		7	51	5	1 2		90.91
	Picze	Nogales Hwy	Wash	5.1 mi S Jct SR 86	1951	4	4 0				2	19	6	10	67 N	8			36 8	5	11		4	86	8	3 1		85.00
DESCRIPTION OF	Condit Wash RCB	Tanque Vende Rd.	Castle Wast	E/G N. Arriberwood Dr.		-	. 0			31 A	2	10	E	/12	91 N		- 1		ber &			3	. 4	146	17			85.00
THE PERSON NAMED IN	THE PERSON	La Childre Rend	The State of the S	REC HOUSE Drive		- 7		MARKE A		PA-			-	0.00	100 H	observe the		1	**		-		-	WIT	**		of the last of	DESCRIPTION.
	Paper Francisco	make the	The State of Street,	SECTION STATE OF				- CO T		*A				100	W7 74			300	30					166				198.48
STREET, STREET, STREET,	Page Was FEB	La Charles Street	-	of Designation (8)				MARKS S		Mile			-	100	***	m	_		M T			9	907	181		-		Territor.
DESCRIPTION OF THE PARTY NAMED IN	Waresi Wash RCB	Drange Grove Rd	Narimi Wash														_		-		_	_	_			_		
CO TOWN YES	North Citrus Wash RCB	La Carecte	North Citrin Water							53			2	10	36													
ART FOR THE	Pegter Wash RCB	La Carada	Pegler Wash							40			3	10	42													
C. HORE FLA	Comes Adelines Wash PCE	Lu Corneda	Cases Adobes Wash							15			4	10	47													
ART COME 'VINE	Las Lomites Wash RCB	Lu Carneda	Las Lomitas Wash							15			2	10	22													
Age Street, while	Carmack Wash RCB	La Canada	Carmack Wash							62			7	10	161													
		La Canada	Garffeld Wash							62 55			5	10	36													
	Medim Wash RCS	Cortaro Farms Road	Medium Wash	Sta 264+32.52	2014								2	10	188													
-06.6		Magee Road	Pegiar Wastr										_															
		Magee Road	Small Wash																									
	Sired Wash RCB	River Road	Setal Wash	4	2006																							
	Carsing Reak RCB	Floor Final	Carriero Fland Wigsts	50x 507 x 39 49	.2006																							
							_	_										_										

COUNTYWIDE CULVERT LOAD RATING PROJECT FEDERAL AID PROJECT NO. HBP PPM-0(249)D ADOT TRACS NO. SB463 01D

PROPOSAL for ENGINEERING SERVICES

HDR Engineering, Inc. July 22, 2016

CONTRACT MODIFICATION #2 ADDITIONAL SERVICES

Pima County requires additional services for the comprehensive load rating of their remaining culverts: 12 Corrugated Metal Pipes (CMPs) and 5 Reinforced Concrete Pipes (RCPs) for 17 structures in total. The additional culvert structures to be rated are listed in the Appendix. The project involves:

- · Obtaining and reviewing design or as-built plans for structures to be load rated
- Obtaining and reviewing National Bridge Inventory (NBI) inspection reports to assess the existing condition of the structures in the load rating list
- Performing field assessments as needed for those structures which may indicate a significant level of deterioration or structural distress from their original condition
- Completing the load ratings using software and/or worksheets using appropriate rating methods and utilizing both the Load Factor Rating Method (LFR) and Load and Resistance Factor Rating Method (LRFR)

The task structure is set up to modify the original tasks as identified in the original Scope of Work dated February 2015. Specific scope of work items includes the following:

Task 1.0 Project Administration: This work includes coordination between Pima County and HDR, obtaining existing project data, modifying the project work plan and schedule, managing staff, project filing, and preparation of monthly status reports.

Deliverables: Monthly Status Reports to be included with Invoices.

- Task 3.0 Review Existing Structure Information: The purpose of this task is to review construction/ as-built plans provided by Pima County for the structures to be load rated. The intent of this task is to provide/determine information in regards to material, geometry, composition, and condition of the structures in order to perform load ratings.
 - 3.1 Review Construction/As-Built Plans: HDR will review the original construction plans or as-built plans (if available) for the structures to be load rated to become familiar with each structure and to develop an action plan (Task 2.3) for load rating the culvert. The plans will be provided to HDR by Pima County.

COUNTYWIDE CULVERT LOAD RATING PROJECT FEDERAL AID PROJECT NO. HBP PPM-0(249)D ADOT TRACS NO. SB463 01D

- 3.2 Review NBI Inspection Reports: HDR will review the most recent NBI inspection reports to become familiar with the existing condition of each culvert. NBI inspection reports will be provided to HDR by Pima County.
- 3.3 Structure Information Summary: HDR will develop a summary of relevant structure information based on the results of Tasks 2.1 and 2.2. The summary will be contained in a spreadsheet that includes structure number (Item N8), structure name (Item A209), facility carried (Item N7, facility intersected (Item N6a), year built (Item N27), culvert type (general description), culvert barrel height (Item A217), culvert barrel length (Item A218), culvert fill height (Item A219), structure skew (Item N34), culvert material (Item N43), number of spans (Item N45), length of span (Item N48), structure length (Item N49), current load posting, condition ratings for Items N62 and N67, the Sufficiency Rating and whether or not a field assessment is required or if any additional information is required to perform the load rating. This summary will be used by HDR staff to determine the requirements and processes for load rating each culvert and to develop an internal load rating action plan.

Deliverables: None.

Task 5.0 Structure Load Ratings: HDR will prepare structural calculations to determine the load capacity of the structures using worksheets provided by Pima County and/or developed by HDR. The calculations will be based on the as-built/construction plans provided by Pima County.

The structures will be rated in accordance with the American Association of State and Highway Transportation Officials (AASHTO) Manual for Bridge Evaluation (MBE), 2nd Edition, with current Interim Revisions, using the Load Factor Rating method (LFR) and the Load and Resistance Factor Rating method (LRFR). Calculations will be supplemented by the AASHTO Standard Specifications for Highway Bridges, 17th Edition (LF), and the AASHTO LRFD Bridge Design Specifications, 6th Edition (LRFD) for structure types not covered by the MBE. Inventory and Operating Ratings for an HS20 vehicle will be determined based on the Load Factor Rating method. The Design Load Rating (at both Inventory and Operating levels) for an HL-93 vehicle will be determined based on the Load and Resistance Factor Rating Method. In addition, when culverts exhibit an Inventory Rating of less than 1.0 using the LFR method, the structure will be evaluated using the Load Factor Method for the following AASHTO Legal Loads:

- AASHTO Trucks: Type 3, Type 3S2, and Type 3-3
- Lane-Type Legal Load (Negative Moment only)
- Notional Rating Load (NRL)
- Single-Unit Bridge Posting Loads: SU4, SU5, SU6, and SU7 (When NRL < 1.0)

Loads and axle configurations for these legal loads are contained in Appendix D6A of the AASHTO MBE. The list of culverts to be rated is attached at the end of this Scope of Work. Estimated hours for this work include the initial rating as well as calculation checking and Quality Control (QA/QC) reviews for the rating.

COUNTYWIDE CULVERT LOAD RATING PROJECT FEDERAL AID PROJECT NO. HBP PPM-0(249)D ADOT TRACS NO. SB463 01D

5.4 Load Ratings for Corrugated Metal Pipe Culverts: There are 12 corrugated metal pipe culverts based on the culvert inventory provided by Pima County. These culverts will be rated using an excel program provided by Pima County that was developed by the Michigan Department of Transportation and MathCad worksheets developed by HDR.

It is assumed for this task that there is sufficient information in the provided as-built plans to complete the ratings. If there is insufficient information in the as-built plans provided, additional information will be requested. If sufficient additional information is not available, HDR will work with the county to provide field assessments under a separate work agreement.

5.5 Load Ratings for Reinforced Concrete Pipe Culverts: There are 5 reinforced concrete pipe culverts based on the culvert inventory provided by Pima County. These culverts will be rated using excel and Mathcad worksheets developed internally by HDR. Load rating analysis will be based on the code and industry practice. Pipes will be rated based on their respective class using information provided in the as-built plans provided and the applicable ASTM standard for RCPs.

It is assumed for this task that there is sufficient information in the provided as-built plans to complete the ratings. If there is insufficient information in the as-built plans provided, additional information will be requested. If sufficient additional information is not available, HDR will work with the county to provide field assessments under a separate work agreement.

Task 6.0 Load Rating Reports: This task includes the preparation of a load rating report for each of the structures and summarizes the results of Tasks 2.0 and 3.0. The reports will include asbuilt or design plans, load rating calculations, and the latest NBI inspection reports. For structures with operating ratings less than 1.0 for any of the AASHTO Legal Loads, a recommendation for a load posting will be made. The reports will be sealed by a Professional Engineer registered in the State of Arizona. A draft version of each report will be submitted to PCDOT for review and comment prior to HDR submitting the final sealed versions.

Deliverables: Draft Load Rating Reports (17 Total) Final Load Rating Reports (17 Total)

Services not included in this scope of work:

- Load testing of structures. If sufficient information regarding the existing condition of a structure
 cannot be obtained from the plans or from a field assessment, or if it is determined after rating
 a structure that a load test will be beneficial, then load testing may be considered and
 addressed under a supplemental agreement.
- Finite Element Models/Analysis of Culverts.
- Fatigue analysis and estimate of remaining fatigue life of steel culverts.
- Design of strengthening or shoring schemes necessary to increase the load capacity of a culvert.
- Hydrologic and hydraulic analyses including scour of the drainage channels, washes, or rivers.
- Field investigation of culverts without as-built information or insufficient plan information.

COUNTYWIDE CULVERT LOAD RATING PROJECT FEDERAL AID PROJECT NO. HBP PPM-0(249)D ADOT TRACS NO. SB463 01D

Design Standards and Guidelines:

American Association of State Highway and Transportation Officials (AASHTO) Manual for Bridge Evaluation, 2nd Edition, with 2011, 2012, 2013, 2014, and 2015 Interim Revisions

American Association of State Highway and Transportation Officials (AASHTO) LRFD Bridge Design Specifications, 6th Edition, 2012

American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges, 17th Edition, 2002, with all interims

EXHIBIT A CULVERT INVENTORY LIST

Plms_County_Culverte February 2, 2015

Structure Number		Structure Hame	FeeBity Carried By Beructure	Feetures Intersected	Location		Lanes o		re To	lesty Di	esign Load	Open, Posted or Shew Closed	Type, Illui - Itleterie	Structure Type, But - Design	in of	Spe	as Stru	De setur Com ngth r	Cons	erell O	pursting Ruting	Inventory Rating	Structural Evaluation	Bridge Posting	Average Dully Trank Traffic	Surface Thickness 8	Culvert Berrel Height	Longth Adjusted in Story True	Culver for Barrel Longit	h Fill H	Hulght	Re	lalanay ating
	Plans		N7	N6a	N9	N27	N28a	N28b	N2	9 N	31 1	N34 N41	N43a	N43b	N45	N48	B N49	N58	N62	. N	64b	N66b	N67	N70	N109	A201	A217	Length	A218	A21	9 De	of Suff	A235
7570 CMP 1	MEB -	Small Wash ChiPA	Hastersta Del Sci	Skroell Wasts	0.8 mi N River Road	1988		2	9	2200 5		29 A	3	19		3	7	27 N	7		36	36	7	5	1	2	ALC: UNKNOWN	4 5	1	56	2		99.50 A
		Browley Wanti CMP	Silverball Phil	Brawley Wash	9.22 mi W of Aguirre Rd	1965		1	9	700 3		4Z A	3	19		3	9	94 N	2		36		8	5			No. of London	5 6	3	80	4		97.52 A
8729 CMP 1	作的	Cirrolt Wiseln.CMP	Consider that that	-Bosaft Wasts	800' S Mission Twin Hutte	1980		2	8	2730 S		45 A	3	19		4	4	35 N	- 8		36	36					ACCOUNT.	4 17	4 1	90	18		89.59 A
6721 CMP Y	PEN	Districting areasy FICSS	Carrien Sat Tierra	Draintegeway	SOO St North Inst Hosel	1980		5	Q	2040 5		45 A	3	18		5	4	46 N	8		36	36	5	6)	10000	£ 8	A /	97	2		97,84 A
BRESS COMP &	NO.	Desirance way CMP	Yest: Boat	Drainageousy	9.2 ml 3 of 1 10	1965		2	9	200 5		PA	2	18		4	4	21 8	7		36	- 36	17	6		1		6 I	A /	44	2		A 68,69
GEEN CMF 1	NO .	Medium Wash CMP	Fasted Telesayo ffici.	Medium Wash	9.25 mt South Crayoroft R	1963		2	0	199 5		PA	8	19		4		36 N	2		30	- 36	7			1	10000	å <i>1</i>	A /	83			99.98 A
4990 CMP 1	YES	Denimiphyny CMP	Station.Ftd.	Diminisprintry	0.1 rel E of Alvamon	1985		2	9	4100 5		16 A	8	19		4	à	24 N	- #		- 26	36		5		1		8 F	4	84	10		98,69 A
ENDS CHAP 1	YES :	Drainingerray Chief	Whitehart Florad	Subdivision Drainagerasy	500 ft of Change Grove	1986		2	0	11 6		QA.	3	19		4.		21 N	- 8		36	96		8		1000	10000		3	13	2		99.00 A
SEST CMP 1	TES	Small Water Char	Common that fact	Smill Wast:	1900 R S Pf Date Dotonia	1980		2	9	2500 5		30 A	9	16		1	3	M AS			38	36		8			CONTRACT	3 8	7 1	30	4		99.25 A
SEC4 CMP 1	YES .	Street Francis CASP	Antic Valley Float	Sherall Pitiests	800 ti West Armay Rend	1900		2		344 0		UA	3	19		4	4	23 N			96	36		.6		4	100000	6 1	0 .	40	2.		99,97 A
9897 CMP 1	res	Direct Wests CMPA	Volumen Planet	Sensit West	SOU'R East Alieston Flood	1983		4	0 2	7979 5		45 A	3	19		3		28 N	7.		96		17	8			1000	4 13	6 1	2	4		71.36 A
11212 CMP. 1	NO	Straff Walli CMP	Villamotia Flat	Dress Wash	YEAD Carriero De La Tierra			5	9 1	2000 5		40 A	3	19		8	5	141 N	#		36		7			2000		5 10	8 1	41	1		85.00 N
7572 HOP 1	(ES	School Wash INCP	Sharehear (Sirbon	Service Wagets	200 R E Pontaios Road	1984		4	0 2	6500 5		14 A	1	18		4		27 N	7		88	36	7	8			A COLUMN TO A COLU	5 1/	0 1	54	100		73.35 A
1996 RCP 1	/ES	Brood Weets HCP	Signaturing Shed	Brindle Wests	200' E Tarque Verde Loop	1980	2	0	201	20 5	1		4	19	4	4	23	N		34		56	6	8	.0	0	4	78	78	4		99.40	00015 A
11911 FCP 1	NO:	Small Waith RGP	Valencia Rd	Small Wash	W/O Avenida Don Fenendo		5	0	125	000 5	ALC: U	49 A	9	19	Á		40	N		35	6	36			5	7	4	108,8944	154			85	N
11812 PCP P		Small Wash RCP	Valerois Pis	Small Week	Just 8/O Beative Ave.		5		129	000 5	1	2 4	1	19	5	4	32	N ·	7	36	8	96	7		9	7	4	114,5718		2		86	N
11314 RCP 6	NO	Small Wash RCP	Valencia Pd	Smell Wesh	W/O Avenida Don Arturo		9	0	121	000 8	1000	90 A	1	19	5	3	28	N	7	96	8	36	7		5	7	9	102.191		1		85	N

HDR Engineering, Inc. HDR Project Number: 20-Jul-16

COUNTYWIDE CULVERT LOAD RATING PROJECT FEDERAL AID PROJECT NO. HBP PPM-0(249)D ADOT TRACS NO. SB463 01D

COST PROPOSAL

ESTIMATED DIRECT LABOR:			
Staff Classification	Est. Hours	Hourly Rate	Labor Cost
Project Principal	0	240.00	\$0
Contract Manager	0	175.00	\$0
Project Manager	13	150.00	\$1,950
Senior Engineer	8	220.00	\$1.760
Project Engineer	144	145.00	\$20,880
Engineer/ Designer	138	105.00	\$14,490
CAD Technician	0	125.00	\$0
Accountant	0	110.00	\$0
Administration	0	65.00	\$0
Total Estimated Labor	303		\$39,080
Sub-Total		=-	\$39,080
ESTIMATED DIRECT EXPENSES:			
		Units	
IDR Vehicle Mileage (Field Assessments @ \$0.445/mile)		0	\$0
liscellaneous Field Expenses (supplies, meals, etc.)			\$0
Reproduction and Plotting (at \$0.06/ b&w page + color & misc.)			\$0
Deliveries, Postage, Fed-ex, UPS, etc. (at \$25/ delivery)		0	\$0
Sub-Total Estimated Expenses			\$0
ADDITIONAL SERVICES TASK 9.1		Cost	
nland Engineering (Non-Destructive Testing) (NOT USED)		-\$7,500	
Penhall Company (Limited Destructive Testing) (NOT USED)		-\$2,500	
IDR Oversight during NDT and LDT (NOT USED)		-\$15,830	
IDR Vehicle Mileage (Office to Bridge Sites @ 0.445/mile)	200	\$0	
Sub-Total Estimated Additional Services Task 9.1	-	-\$25,830	
DDITIONAL SERVICES TASK 9.2			
Sub-Total Estimated Additional Services Task 9.2		\$0	
DDITIONAL SERVICES TASK 9.3			
Sub-Total Estimated Additional Services Task 9.3 Total Additional Services		-\$13,250	
Total Additional Services		-\$39,080	
То	tal Estimated Cost	of Additional Work	\$39,080
Total Credit for Work not Performed unde	r Additional Service	es Task 9.1 and 9.3	-\$39,080
Total Ch	ange to the Origina	I Contract Amount	\$0
	Additional S	ervices Remaining	\$6,750
Additional services will only be used upon written approval from the	e Pima County Bridg	e Engineer	

Average hourly rates are based on HDR's FAR Overhead (158.2%) and a 10% fee.

ESTIMATED LABOR HOURS

7/20/2016	Project.	Contract	Project Manader	Senior Engineer	Project Engineer	Engineer/	CAD	Accountant.	Administration	TOTAL HOURS PERTASK	HOR COST OF TASK	Outside Services Cost	Direct Experiess	TOTAL COS OF TASK
Used Loaded Rates	240.00	175.00	150.00	220.00	145.00	105.00	125.00	110.00	65.00					
TASKS														
Task 5.0 STRUCTURE LOAD RATINGS									1 3				part of the second of the seco	
5.1 Load Ratings for Reinforced Concrete Box Culverts (Credit for 3 culverts not rated)			-4	-2	-18	-24				-48	-\$6,170			-\$6,170
5.2 Load Ratings for Reinforced Concrete Arches (2 additional arches and 7 requiring additional analyses due to complex geometry)			14	9	146	146				315	\$40,580			\$40,580
5.3 Load Ratings for Steel Plate Arches (1 requiring additional analysis due to complex geometry)	- 1		3	1	16	16				36	\$4,670			\$4,670
Subtotal) last 5.0	resty # 10			and the same of	-141	1	1			300	(SED) (SED)	A CONTRACTOR OF THE PARTY OF TH	20	228 ORT
TOTAL TASKS 1 THROUGH 8 (WITHOUT ADDITIONAL SERVICES)			11		104	191				203	\$39,080		The section of the se	\$59,00
T ME SO ADDITIONAL SERVICES	Control of the Contro		Secretary and decision in the province of the providing			And the second s)				\$50		A STATE OF THE STA	
9.1 Non-Destructive Testing (NDT) and Limited Destructive Testing (LDT) with HDR Oversight		-2	-4	-16	-32	-64				-118	-\$15,830	-\$10,000	ŝú	-\$25,830
9.2 Load Rating of SHVs on Pima County Bridge Inventory										0	\$0		-	\$0
9.3 Additional Work	Annual statement and the P	Control of the latest	NA SERVICE AND THE SERVICE MANAGEMENT	ALTERNATIVE MANAGEMENT	-	The same and same as a same of		AND DESCRIPTION OF THE PARTY OF			-\$13,250			-\$13,250
Sublotal Task 1.0				*19	-32					350		-\$70,000	En En	55,505
Haziv take are based on HERR SAS OH (158.2%) and a 10% fee.	0	-2	9	-6	112		0		0	699	\$10,000	-510,000		

HDR Engineering, Inc. HDR Project Number: 22-Jul-16

COUNTYWIDE CULVERT LOAD RATING PROJECT FEDERAL AID PROJECT NO. HBP PPM-0(249)D ADOT TRACS NO. SB463 01D

COST PROPOSAL - CONTRACT MODIFICATION #2

ESTIMATED DIRECT LABOR:			
Staff Classification	Est. Hours	Hourly Rate	Labor Cost
Project Principal	0	240.00	\$0
Contract Manager	12	175.00	\$2,100
Project Manager	45	150.00	\$6,750
Senior Engineer	36	220.00	\$7,920
Project Engineer	229	145.00	\$33,205
Engineer/ Designer	232	105.00	\$24,360
CAD Technician	0	125.00	\$0
Accountant	6	110.00	\$660
Administration	10	65.00	\$650
Total Estimated Labo	r 570		\$75,645
Sub-Tota	ı	_	\$75,645
ESTIMATED DIRECT EXPENSES:			
		Units	
Reproduction and Plotting (at \$0.06/ b&w page + color & misc	:.)		\$100
Deliveries, Postage, Fed-ex, UPS, etc. (at \$25/ delivery) Sub-Total Estimated Expense:			\$0
	•		\$100

Total Estimated Cost

\$75,745

Average hourly rates are based on HDR's FAR Overhead (158.2%) and a 10% fee.

ESTIMATED LABOR HOURS - CONTRACT MODIFICATION #2

	Preject Principal	Contract	Project	Senior	Projecti.	firmiree?	CAD Tachnician	Accountant	Administration	TOTAL HOURS PERTASK	HDR COST OF TASK	Conside Services Cost	Direct Expenses	TOTAL COST OF TASK
Used Loaded Rates	240.00	175.00	150.00	220.00	145.00	105.00	125.00	110.00	65.00					
TASKS														
Task 1.3 PROJECT ADMINISTRATION			San Name					- Marian Maria						
		2		6					6	20	\$2,300			\$2,300
Subletal Task 1.6	1		- Auto-observation	1		a week deems		Constitution of the Consti		20	-80,500		ingli in a	\$2.30
TASK 3.0 (IEVIEW EXISTING STRUCTURE INFORMATION)	-			-	No. of Street,		and the same of th	And the second s			James Company of Street, Stree	And the second s	The state of the s	
3.1 Review Design or As-Built Plans		and the same of th	C. all Williams	The same of the sa	1	2	The street of the street of	(a) (a)	A Tracks	4	\$505	mm		\$505
3.2 Review NBI Inspection Reports					1	2			"	4	\$505			\$505 \$505 \$505
.3 Structure Information Summary				1	1	2	2			4	\$505			\$505
Subject 1 seek 34					-						\$1,516		And the said of th	
THE STEEN STRUCTURE LOAD RATHESS		adechile extension ex-			A Continue and a literature	and the same of th			2 Service State of the Service of th	A C. M. VIII. TO SHOW IN				
5.4 Load Ratings for Corrugated Metal Pipes (12 total)	1		12	12	100	100				224	\$29,440	And the second s	N. V. J. D. S. C.	\$29,440
5.5 Load Ratings for Reinforced Concrete Pipes (5 Total)	-			5 5	50					110	\$14,350			\$14,350
Suboli Tex 5.	12 .0	200	- 1	17	190	18	1 2 2 0	7. 90 4	ALC DE	ma / 0 - 334	243.740	and the same of the same of	acres Comments	\$45,790
Tesa FE (DES RATING REPORTS	Company of the last	-	Section 19 and 1		Account on Franklin	D. T. L. D. L. S. L. S.	The state of the s	and the same of the same of		0.00	A CONTRACTOR OF THE PARTY OF TH	Company of the last of the las	all marifes are now now how	San Land
COR SE SUAD RATING RECORDS	-	10	19	19	76	76			4	204	\$28,040	Committee of the Commit	W. D. AND ST. CO.	\$28,040
Suntain Tree 6.1		10		19	70		0		1	-204	\$25,040	and the same in the same of th		\$28,040
		S Sussessment of the same	2011 C.	and the second second second			- American Company			Andreas to the second s	Laminos hamphony billion by the later of			
TOTAL TASKS 1 THROUGH 6		12	- 4		229					570	\$75,645	-	5100	\$75,745

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HDR Engineering, Inc.

HDR Project Number:

22-Jul-16

Reproduction &	Plotting
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		-		
Print each set of calcs for the culverts @ 50 pages/set	50	17	\$0.06	\$51.00
Load Rating Reports (Assume 15 pages each)	15	17	\$0.06	\$15.30
Miscellaneous Printing (Drafts, Color Sheets, etc.)				\$33.70
			Total	\$100.00