

PANAMA CANAL AUTHORITY	VARIATION	PAGE 1 OF 7
1. REQUEST FOR PROPOSAL No.: RFP-76161	2. CONTRACT No.: CMC-221427	3. DATE: June 3 , 2010
		4. VARIATION No.: 004

5. ISSUED BY:

PANAMA CANAL AUTHORITY
Employer's Representative
Locks Project Management Division
Building 740, Corozal
Panama, Republic of Panama

6. NAME AND ADDRESS OF CONTRACTOR (INCLUDE PHYSICAL & POSTAL ADDRESS) Grupo Unidos por el Canal Building 732, Corozal West Panama, Republic of Panama	7. CONTRACTOR'S TELEPHONE NUMBER: 507-317-6736
	8. CONTRACTOR'S FACSIMILE NUMBER: N/A

9. VARIATION:

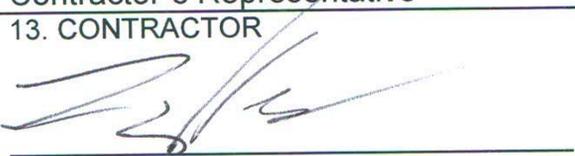
- The contract referred to in item No. 2 is hereby varied as set forth in item 10, entitled "DESCRIPTION OF VARIATION".
 YES. NO. The contractor shall send a copy, duly signed, of this Variation to the Employer's Representative/Contracting Officer.

	9 A. THIS VARIATION IS EXECUTED ON THE BASIS OF: (Specify the legal authority). THE VARIATION DESCRIBED IN ITEM 10 IS HEREBY INCORPORATED AND MADE A PART OF THE CONTRACT.
	9 B. THE CONTRACT REFERRED TO IN ITEM NO. 2, IS VARIED TO INCORPORATE ADMINISTRATIVE CHANGES (such as the paying office, account numbers, etc.).
X	9 C. THIS BILATERAL AGREEMENT IS SIGNED AND INCORPORATED INTO THE CONTRACT REFERRED TO IN ITEM NO. 2 OF THIS FORM, ON THE BASIS OF: (Specify the legal authority) Volume III, Conditions of Contract , Sub-Clause 1.16 [Entire Agreement], 4th Paragraph
	9 D. OTHER. (Specify manner and the legal authority).
	9 E. ACCOUNT NUMBER (If required):

10. DESCRIPTION OF THE VARIATION (List in accordance with the order of the Contract. If additional space is required, use blank sheets).

See attached

Except for the variation(s) herein specified, all other terms and conditions of the Contract remain unchanged.

11. NAME AND TITLE OF THE PERSON AUTHORIZED TO SIGN (Type or print) Antonio Maria Zaffaroni Contractor's Representative	12. NAME AND TITLE OF THE EMPLOYER'S REPRESENTATIVE/CONTRACTING OFFICER (Type or print) Jorge de la Guardia, Employer's Representative
13. CONTRACTOR  (Authorized signature)	14. DATE: 14 Jun 10
	15. PANAMA CANAL AUTHORITY  (Employer's Representative/Contracting Officer's signature)
	16. DATE: 3/VI/2010

Variation No. 4 is issued to incorporate the following changes:

1. Volume II, Part 1, Section 01 81 16 – [Lock Structures] - Paragraph 1.05 B. after the last sentence incorporate the following:

“Inclusion of locations of embedded parts in the Intermediate Design may be waived and deferred to the Final Design Stage, and the Contractor shall not be entitled to any extension of Time for Completion and/or any Milestone Date, and/or any additional Payment under these terms or otherwise in connection with the Contract provided that:

- Enough consideration is given by the Contractor to the possible location, size and type of all expected embedded items and secondary concrete pours, and their possible impact on the design of the elements is considered,
- The Intermediate design submittal shows the nature of all expected embedded items in the block out locations and clearly states that these will be included in final design submittal for each type of structure.
- Possible changes on the resulting block-out locations for detailing of the embedded items do not have a direct influence on the structural design of the elements, or cause future disruptions to the design process that may lead to time delays”.

2. Volume II, Part 1, Section 01 81 19 [Lock Gates], Sub-Paragraph 1.05 B, Preliminary Design Data. Include the following sentence at the end of the paragraph: The Preliminary Data shall be submitted for one (1) set of representative rolling gates (PAC RG 3, 4, 5 and 6).

3. Volume II, Part 1, Section 01 81 19 [Lock Gates], Sub-Paragraph 1.05 B, Preliminary Design Data. Delete the following requirements:

1. Lock Gate Data: The data shall contain the general arrangement drawings, calculations, critical dimensions, and overall dimensions including installation drawings for the gate and concrete-embedment sequence.
3. Structural Frame Data: This data shall include, but shall not be limited to, the calculations, structural frame design, seismic performance calculations, and drawings showing general dimensions and arrangement of auxiliary equipment, as indicated in Subparagraphs 1.01 B.2., and B.3. of this Section.
6. Weight, Buoyancy, Center of Gravity, and Other Stability Data: The Contractor shall submit for review by the Employer’s Representative estimates on the weight, buoyancy, and center of gravity, as well as stability calculations and other relevant data. Buoyancy calculations for all load conditions shall also be submitted for review by the Employer’s Representative.
7. Purchased Equipment Data: The Contractor shall submit, for the review of the

Employer's Representative, a list of equipment for intended purchase with technical documentation attached, including the catalog items mentioned in

Subparagraph 1.04 U. (Operating Machinery) of this Section.

8. **Historical Data, Accelerated Tests, and Calculations:** The Contractor shall submit historical data (of equal or more severe design conditions), accelerated test results, and calculations that prove compliance with the design life specified in Subparagraph 1.04 J. of this Section. The Contractor shall be required to explain how this data demonstrates the ability to meet or exceed the design life specified.
 9. **Numerical Models:** A three-dimensional numerical model of each gate size shall be provided. Numerical models shall be provided, as a minimum, for structural adequacy, floating stability verifications, seismic performance, and hydrodynamic load effects on gate structure and operating machinery.
4. **Volume II, Part 1, Section 01 81 19 [Lock Gates], Sub-Paragraph 1.05 C, Intermediate Design Data.** Delete the second sentence of the paragraph and replace it with the following: "This shall include, but shall not be limited to the intermediate version of the data listed below:
1. **Lock Gate Data:** The data shall contain the general arrangement drawings, calculations, critical dimensions, and overall dimensions including installation drawings for the gate and concrete-embedment sequence.
 2. **System Design Data:** The system-design data shall include, but shall not be limited to, the major systems, such as the electrical, hydraulic, and mechanical systems and their main components, such as motors, gear units, wire rope winch drums, pumps, and valves. It shall provide the final general dimensions and exact location of major components and electrical components. It shall include design analysis of all the forces acting on each lock gate.
 3. **Structural Frame Data:** This data shall include, but shall not be limited to, the calculations, structural frame design, seismic performance calculations, and drawings showing general dimensions and arrangement of auxiliary equipment, as indicated in Subparagraphs 1.01 B.2., and B.3. of this Section.
 4. **Electrical and Electronic System Data:** The electrical and electronic system data shall include drawings and information on electrical power and control circuits and information on standard components to be used. The Contractor shall submit its proposed remote control system including the frequencies to the Employer Representative for review. Data shall include control sequence.
 5. **Pedestrian and Vehicular Crossing Equipment Data:** The pedestrian and vehicular crossing equipment design data shall include general dimensions and details on other auxiliary equipment for pedestrian and vehicular crossings.

6. **Weight, Buoyancy, Center of Gravity, and Other Stability Data:** The Contractor shall submit for review by the Employer's Representative estimates on the weight, buoyancy, and center of gravity, as well as stability calculations and other relevant data. Buoyancy calculations for all load conditions shall also be submitted for review by the Employer's Representative.
7. **Purchased Equipment Data:** The Contractor shall submit, for the review of the Employer's Representative, a list of equipment for intended purchase with technical documentation attached, including the catalog items mentioned in Subparagraph 1.04 U. (*Operating Machinery*) of this Section.
8. **Historical Data, Accelerated Tests, and Calculations:** The Contractor shall submit historical data (of equal or more severe design conditions), accelerated test results, and calculations that prove compliance with the design life specified in Subparagraph 1.04 J. of this Section. The Contractor shall be required to explain how this data demonstrates the ability to meet or exceed the design life specified.
9. **Numerical Models:** A three-dimensional numerical model of each gate size shall be provided. Numerical models shall be provided, as a minimum, for structural adequacy, floating stability verifications, seismic performance, and hydrodynamic load effects on gate structure and operating machinery.
10. **Corrosion Control Coating Schedules:** Coating schedules, technical sheets and material safety data sheets for coating materials for the Recess closures, rolling gates, trackway, pedestrian and vehicular traffic areas, handrails and traffic rails, equipment, and piping shall be provided. See Section 09 96 00 (*Corrosion Control Coatings*).
11. **Preliminary QCP and TIP:** The quality-control program (QCP) and the testing and inspection program (TIP) shall describe the quality-assurance and testing and inspection programs, respectively. Copies of certifications issued to the Contractor or Subcontractors shall be included along with these programs. NDT programs and procedures shall be clearly outlined in the QCP.
12. **Gate Recess Pumping/Dewatering System Design Data:** Design data about the gate Recess pumping/dewatering system shall be provided as specified. The size and capacity of each pump shall be clearly indicated.
13. **Data on Recess Closures, Maintenance Closures:** This data shall contain the general arrangement drawings, calculations, critical dimensions, and overall dimensions.

5. Volume II, Part 1, Section 01 81 19 [Lock Gates], Sub-Paragraph 1.05 C, Intermediate Design Data. Include the following at the end of the paragraph:

“The Intermediate Design Data shall be initially submitted for only one (1) gate type instead of all gate types. The representative set of rolling gates shall be

(PAC RG 3, 4, 5 and 6). The initial Intermediate Design Data (Gate Type PAC RC 3, 4, 5 and 6) will be followed by Intermediate Design submittals for all rolling gate types”. Refer to the attached Schedule Analysis (Attachment No. 1)

6. Volume II, Part 1, Section 01 81 23 [Culvert and Conduit Valves], Sub-Paragraph 1.05 B.4”. Delete the following requirement:

4. *“Electrical and Electronic System: This data shall include information on electrical power, control circuits, control sequence, and information on standard components to be used. The Contractor shall submit any proposed remote-control system, including the frequencies to be used, to the Employer’s Representative for review”.*

7. Volume II, Part 1, Section 01 81 23 [Culvert and Conduit Valves], Sub-Paragraph 1.05 C”. Replace the second sentence of the paragraph with the following:

“The design data shall include the intermediate version of the documents submitted with Contractor’s Technical Proposal and the documents listed below:

1. Valve Design Data: The valve data shall contain the general arrangement, calculations, critical dimensions, and overall dimensions. The design data shall include design analysis of all the forces acting on each lock valve.
2. System Design: The system design data shall include the major systems, such as the electrical and mechanical systems and their main components. It shall provide the final general dimensions, exact location of major components, and electrical components.
3. Structural Frame: The structural frame data shall include, but shall not be limited to, the calculations, structural frame design, seismic performance and^{A7} drawings showing general dimensions and arrangement of auxiliary equipment.
4. Electrical and Electronic System: This data shall include information on electrical power, control circuits, control sequence, and information on standard components to be used. The Contractor shall submit any proposed remote-control system, including the frequencies to be used, to the Employer’s Representative for review.
5. Corrosion Control Coatings Schedules: Technical sheets and material safety

data sheets for coating materials for valves, bulkheads, embedded steel, and other metal shall be provided. Refer to Section 09 96 00 (*Corrosion Control Coatings*) and to Section 05 50 13.13 (*Metallizing and Coating Hydraulic Structures*).

6. Weight, Center of Gravity, Lifting Points, and Other Relevant Data: The

Contractor shall submit, for the review of the Employer's Representative, an estimate of weight, center of gravity, lifting points, calculations, and other relevant data for the culvert and WSB valves. Weight, center of gravity, lifting points, and other relevant data shall be submitted for all major components.

7. Historical Data, Accelerated Tests, and Calculations: The Contractor shall submit historical data (of equal or more-severe design conditions), accelerated test results, and/or calculations that demonstrate that the proposed valve system complies with the design life specified in Subparagraph 1.04 H. of this Section. The Contractor shall be required to explain how the data meets or exceeds the design life specified.

8. **Volume II, Part 1, Section 01 81 26 - [Communications, Control, Safety, and Security Systems]** - In Paragraph 1.02 KK delete in its entirety the following Standards:

WC-5-96 Thermoplastic-Insulated Wire and Cable for the
Transmission and Distribution of Electrical Energy

WC-7-98 Cross-Linked-Thermosetting-Polyethylene-Insulated Wire
and Cable for the Transmission and Distribution of Electrical
Energy

And replace them with the following Standard:

WC-57-04 *Standard for Control, Thermocouple Extension, and
Instrumentation Cables*

9. **Volume II, Part 2, Section 40 95 73 - [Control Cables]** - Delete in its entirety Paragraph 1.03.A.3 and replace it with the following:

3. *"All cables shall be suitable for installation outdoors or indoors in industrial applications, and shall comply with NEMA WC 57"*.

10. **Volume II, Part 2, Section 40 95 73 - [Control Cables]** - Delete in its entirety Paragraph 1.03.C.2 a. and replace it with the following revised Paragraph:

a. *"Conductor insulation shall be XHHW type"*.

11. **Volume II, Part 2, Section 40 95 73 - [Control Cables]** - Delete in it's entirety Paragraph 1.03.C.5 b. and replace it with the following revised Paragraph:

b. (Reserved).
12. **Volume II, Part 2, Section 40 95 73 - [Control Cables]** - Delete in it's entirety Paragraph 1.03.C.5 d. and replace it with the following:

d. "Control Cables shall be shielded wherever required".
13. **Volume II, Part 3, Section 01 33 00 [Submittal Procedures], Sub-Paragraphs 1.05 E and 1.07 B.** Include the following sentence at the end of both paragraphs:
"No X-ref for AutoCAD electronic drawing submittals will be required for Auto CAD drawings generated via the Revit Models".
14. **Volume II, Part 3, Subpart 1, Section 01 35 23 – [Health and Safety Requirements]** - After the last sentence of Paragraph 1.02 A include the following:

"The Employer will also provide the Contractor with an electronic copy of the Employer's coded Material Safety Data Sheets (MSDS) as of May 2010. Subsequent electronic copies of the coded MSDS shall be requested by the Contractor, in writing to the Employer's Representative".
15. **Volume II, Part 3, Subpart 1, Section 01 35 23 – [Health and Safety Requirements]** - Delete in it's entirety Paragraph 1.03 A [Material Safety Data Sheets (MSDS)] and replace it with the following revised Paragraph:

"A. Material Safety Data Sheets (MSDS): For each hazardous material proposed for procurement (and not included in the electronic copy of the Employer's coded MSDS Database), MSDS shall be submitted for review in the English or Spanish languages at least 28 days in advance of pertinent work."

Schedule of Engineering for Lock Gates

Id.	Activity description	baseline start	baseline finish	Proposed start	Proposed finish	2010												2011																	
						oct	nov	dic	ene	feb	mar	abr	may	jun	jul	ago	sep	oct	nov	dic	ene	feb	mar	abr	may	jun	jul	ago	sep	oct	nov	dic			
1	General data collection; prepare PD	NOD	NOD	01/10/09	01/01/10	General data collection; prepare PD																													
2	Design gate type C; Intermediate (Pa 3,4,5,6)	24/11/09	18/05/10	04/01/10	18/05/10	Design gate type C; Intermediate (Pa 3,4,5,6)																													
3	Design gate type C; Final (Pa 3,4,5,6)	19/05/10	13/01/11	19/05/10	02/11/10	Design gate type C; Final (Pa 3,4,5,6)																													
4	Design gate type B; Intermediate (At 3,4,5)	23/11/09	17/05/10	07/06/10	21/07/10	Design gate type B; Intermediate (At 3,4,5)																													
5	Design gate type B; Final (At 3,4,5,6)	18/05/10	24/10/10	22/07/10	03/11/10	Design gate type B; Final (At 3,4,5,6)																													
6	Design gate type D; Intermediate (At 7,8)	23/11/09	17/05/10	22/12/09	24/01/11	Design gate type D; Intermediate (At 7,8)																													
7	Design gate type D; Final (At 7,8)	18/05/10	20/08/11	25/01/11	10/06/11	Design gate type D; Final (At 7,8)																													
8	Design gate type E; Intermediate (Pa 7,8)	24/11/09	18/05/10	03/11/10	24/01/11	Design gate type E; Intermediate (Pa 7,8)																													
9	Design gate type E; Final (Pa 7,8)	19/05/10	31/08/11	25/01/11	10/06/11	Design gate type E; Final (Pa 7,8)																													
10	Design gate type A; Intermediate (Pa 1,2)	24/11/09	18/05/10	24/01/11	17/03/11	Design gate type A; Intermediate (Pa 1,2)																													
11	Design gate type A; Intermediate (At 1,2)	23/11/09	17/05/10	24/01/11	17/03/11	Design gate type A; Intermediate (At 1,2)																													
12	Design gate type A; Final (Pa 1,2)	23/06/10	21/06/11	21/03/11	01/06/11	Design gate type A; Final (Pa 1,2)																													
13	Design gate type A; Final (At 1,2)	18/05/10	16/05/11	21/03/11	01/06/11	Design gate type A; Final (At 1,2)																													
14	Design recess closures (At & Pa)	NOD	NOD	19/04/10	28/04/11	Design recess closures (At & Pa)																													
15	E&I design on-gate equipment (At & Pa)	NOD	NOD	01/01/10	11/03/10	E&I design on-gate equipment (At & Pa)																													
16	E&I design (off-gate) (At & Pa)	NOD	NOD	12/03/10	07/10/10	E&I design (off-gate) (At & Pa)																													
17	Mech design on-gate equipment (At & Pa)	NOD	NOD	01/01/10	11/03/10	Mech design on-gate equipment (At & Pa)																													
18	Mech design drive mechanism (off-gate) (At & Pa)	NOD	NOD	12/03/10	07/10/10	Mech design drive mechanism (off-gate) (At & Pa)																													
19	RA, QMP, T&P	NOD	NOD	04/01/10	26/08/11	RA, QMP, T&P																													