

PANAMA CANAL AUTHORITY	VARIATION	PAGE 1 OF 9
1. REQUEST FOR PROPOSAL No.: RFP-76161	2. CONTRACT No.: CMC-221427	3. DATE: September 24, 2013
		4. VARIATION No.: 076

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, S.A. Building 22B, Brujas Road Cocoli, Republic of Panama	7. CONTRACTOR'S TELEPHONE NUMBER: 507-316-9900
	8. CONTRACTOR'S FACSIMILE NUMBER:

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], and Sub-Clause 4.23 [Contractor's Operations on Site]
	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) Bernardo Gonzalez 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: 24/09/2013
15. PANAMA CANAL AUTHORITY  (Employer's Representative/Contracting Officer's signature)	16. DATE: 24/11/2013

Variation No. 076 is issued to incorporate the following changes:

1. **Volume II, Part 1, Section 01 81 29 [Electrical and Lighting Systems]** - Delete Paragraph 1.04 G. 2. in its entirety and replace it with the following:

"2. WSB Feeders: Each water saving basin conduit valve's motor control center shall be fed from the adjacent electrical room with low voltage, or by means of medium voltage pad mounted transformer, (this alternate source arrangement is not shown on Drawings No. 5802-400 and 5803-400) and also be fed from an alternate electrical room by means of a normally open tie breaker (Refer to Vol. VI, Part 1 for location of drawings). To avoid voltage feedback, the tie breaker and incoming breakers shall be provided with hardwire interlocks to inhibit local and remote operation of the tie breaker without opening one of the incoming breakers and the closing of the two incoming breakers when the tie breaker is closed. As required in Section 26 24 19 (Motor Control Center) and Drawings No. 5802-400 and 5803-400."

(IAE-GUPC -0189)
(RFI-0172)

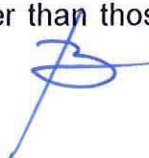
2. **Volume II, Part 2, Section 01 86 13 [Plant Mechanical Systems and Equipment]**: Delete Paragraph 1.04 D. in its entirety and replace it with the following:

"D. **Passenger Elevator**: This specification requires the fabrication, installation, testing and maintenance of a 900 kg (2,000 lb) capacity electric elevator at the control house building. This elevator shall be in strict accordance with ASME A17.1 "Safety Code for Elevators, Dumbwaiters, and Escalators", ANSI A117, and the Employer's Requirements. The elevator shall be complete with control equipment, automatic floor leveling, automatic car and hoist-way doors and all other equipment necessary for safe and satisfactory operation. The Contractor shall repair, maintain, and test the equipment for a period of one year after date of acceptance of the elevator by the Employer's Representative in accordance with ASME A17.1. For manufacturers other than those located in the USA, the latest edition of European Standard EN81 can substitute the ASME standard. The Contractor or the Subcontractor responsible for the elevator, shall be an authorized licensee of the elevator manufacturer, who has not less than 5 years successful experience with the installation of similar elevators, and who maintains a service center within 40 km from the elevator."

(GUPC-IAE-2101)
(IAE-UPC-1632)
(RFV-199)

3. **Volume II, Part 2, Section 01 86 13 [Plant Mechanical Systems and Equipment]**: Add Paragraph 1.04 E.5 as follows:

"5. For manufacturers other than those located in the USA, the latest edition of



European Standard EN81 can substitute the ASME standard.”

(GUPC-IAE-2101)
(IAE-UPC-1632)
(RFV-199)

4. **Volume II, Part 2, Section 27 31 23 [IP-based Telephone System]:** Add Paragraph 1.02 B. to provide updated background information as follows:

“B. Background Information

1. Communications Servers

- a. The Employer private telephone network includes telephone switches near the new locks at Corozal West 741, Gatun 24/26, Miraflores 7D, and Mount Hope 5105-X.
- b. Gatun and Miraflores telephone switches are currently Avaya Meridian Communications Server CS-1000 MG (Multigroup) with version 7.5 software.
- c. Main trunks are E1 and IP/SIP type, and T1 trunks remain for backup. E1s use A law, and IP and T1s use μ law.

2. Connections to Public and International Telephone Networks

- a. The Employer’s private telephone network connects to the Republic of Panama’s public telephone network via C7 gateways in Balboa 69 and Corozal West 741, and using R2 signaling.
- b. International phone dialing is done via Panama’s public network.

3. Telephone Sets

- a. The Employer’s entire telephone network currently has approximately 11,421 extensions for fax and voice: 71.0% analog, 28.3% digital, and 0.7% IP.
- b. Software version 7.5 enables acquisition of third party licenses, and the use of standard SIP phones.
- c. IP telephones get their 7 digit extension number and IP address from the communications servers and the Employer’s DHCP server, respectively. After obtaining a valid IP address, the call request is routed to the chosen signaling server (Miraflores, Gatun or any other communications server). Once the telephone registers at the signaling server, it finishes the installation by validating the virtual location (TN)



September 24, 2013

Design and Construction of the Third Set of Locks

at the set with the one programmed in the corresponding communications server.”

(GUPC-IAE-2093)
(IAE-UPC-1514)
(RFV-174)

5. **Volume II, Part 2, Section 27 31 23 [IP-based Telephone System]:** Add Paragraph 1.03 A.2.c to complement dialing plan information as follow:

“The Employer has reserved the following telephone number series for the third set of locks: 443-1xxx for Atlantic, and 272-6xxx for Pacific locks.”

(GUPC-IAE-2093)
(IAE-UPC-1514)
(RFV-174)

6. **Volume II, Part 2, Section 27 31 23 [IP-based Telephone System]:** Delete Paragraph 1.03 A.3.b in its entirety and replace it with the following:

“New equipment at the Atlantic and Pacific Lock complexes shall be compatible with AVAYA Aura Session Manager release 6.2, and shall be part of AVAYA DevConnect Program.”

(GUPC-IAE-2093)
(IAE-UPC-1514)
(RFV-174)

7. **Volume II, Part 2, Section 27 31 23 [IP-based Telephone System]:** Add Paragraphs 1.03 A.4 through 10 to specify additional general requirements to ensure full functionality of new communications servers with the rest of the Employer’s telephone network as follows:

“4. **Functions:** As a minimum, the telephone systems shall have the latest available version of all active access to information, access to people, administration/maintenance, attendant, hospitality, station, system, and telephone network functions of Avaya Essential Suite software package.

5. **Grade of Service:** The new system shall maintain a grade of service of $P \leq 0.01$ (1 busy in 100 attempts), or better at all times. This represents a minimum required goal for quality of service to users, not a calculated value.

6. **Quality of Service (QoS):** Dedicated LANs shall be used so that IP telephony does not compete with other services for bandwidth.

7. **SIP Devices:** SIP devices shall comply with IETF RFC 2543 and RFC 3261. For interoperability and portability purposes, IP/SIP phones shall use SIP line signaling instead of SIP trunking.

8. **Tone Plan:** Shall be in accordance with Telcordia system precise tone plan



and shall support DTMF.

9. Voice Codecs : If used, shall meet the requirements of ITU-T G.711 (64 kbps for use in LAN and WAN), G.723, G.726 (32 kbps), G.728 (16 kbps), and G.729 and/or G.729.a (8 kbps).

10. Voice Features: Should compression be used, the system shall support silence and fax idle suppression, as well as echo cancellation.”

(GUPC-IAE-2093)
(IAE-UPC-1514)
(RFV-174)

- 8. Volume II, Part 2, Section 27 31 23 [IP-based Telephone System]:** Add Paragraph 1.03.B.5. to specify communications servers equipment as follows:

“5. **Communications Servers:** Units shall include call server(s), session manager server(s), signaling server(s), media gateways, and data communication equipment as required.”

(GUPC-IAE-2093)
(IAE-UPC-1514)
(RFV-174)

- 9. Volume II, Part 2, Section 27 31 23 [IP-based Telephone System]:** Add Paragraph 1.03.D.5. to specify installation of communications servers as follows:

“5. **Communications Servers:** Shall be installed in designated areas in control buildings and be connected to the Employer’s telephone network using IP trunks as required.”

(GUPC-IAE-2093)
(IAE-UPC-1514)
(RFV-174)

- 10. Volume II, Part 2, Section 27 31 23 [IP-based Telephone System]:** Delete Paragraph 1.04.B. in its entirety and replace it as follows:

B. Design Criteria: Existing Avaya telephone systems at Employer facilities shall be adapted by the Employer to connect with the new equipment in Atlantic and Pacific Locks complexes, respectively, providing complete functionality.”

(GUPC-IAE-2093)
(IAE-UPC-1514)
(RFV-174)

- 11. Volume II, Part 2, Section 28 23 00 [Closed Circuit Video Systems]:** Add two new paragraphs to 1.03 C.3.d as follows:

“4) External devices are acceptable for thermal cameras as an alternative to internal video stabilization.



5) The PTZ drive of thermal cameras shall have a variable pan speed range of 0.1-50° or higher, and at least a pan preset speed of 50° per second in 145 km/h (90 mph) winds."

(GUPC-IAE-2097)
(IAE-UPC-1654)
(RFV-197)

12. **Volume II, Part 2, Section 28 23 00 [Closed Circuit Video Systems]:** Delete Paragraph 1.03 C.3.a.10) in its entirety and replace it with:

"10) Cameras shall operate on 12 VDC, 24 VAC, 24 VDC, or Power over Ethernet (PoE)."

(GUPC-IAE-2097)
(IAE-UPC-1654)
(RFV-197)

13. **Volume II, Part 2, Section 28 23 00 [Closed Circuit Video Systems]:** Delete Paragraph 1.03 C.4.a.1) in its entirety and replace it with:

"1) All camera housings for use in exteriors shall be weatherproof (IP 66, NEMA 4X, or better)."

(GUPC-IAE-2097)
(IAE-UPC-1654)
(RFV-197)

14. **Volume II, Part 2, Section 28 23 00 [Closed Circuit Video Systems]:** Add a new Paragraph under 1.03 C.4.b as follows:

"3) Housings shall be a dust and water tight dome or cylinder box, pressurized with dry nitrogen to protect camera and optics against corrosion.

(GUPC-IAE-2097)
(IAE-UPC-1654)
(RFV-197)

15. **Volume II, Part 2, Section 28 23 00 [Closed Circuit Video Systems]:** Delete Paragraph 1.3 C.14.a.4) in its entirety and replace it with the following:

"4) Capability of handling presets controlled from Programmable Logic Controllers (PLCs)."

(GUPC-IAE-2097)
(IAE-UPC-1654)
(RFV-197)

16. **Volume II, Part 2, Section 40 95 73 [Control Cables]:** Delete Paragraph 1.03 C.5.c in its entirety and replace it with the following:

"c. Conductors shall be Class B, 7-strand copper or better and meet the design



(GUPC-IAE-2106)
(IAE-UPC-1452)
(RFI-558)

17. **Volume II, Part 2, Section 40 96 45.13 [Process Control Software for LMCS]-**
Delete Paragraph 1.04 E.7.g, and replace it with the following:

"g. For all modes, an emergency shutdown command at the control rooms of the control buildings, implemented by means of a mushroom type stop button, shall cancel all macro operations. After issuing this Emergency Shutdown command, all moving valves or moving rolling gates shall go to safe shutdown position. Semi-automatic or automatic modes shall end. After a reset command, an operation mode (manual, semi-automatic, or automatic) shall be selected to continue the operation.

In case the local gravity close button is pushed at a valve, the automatic and semiautomatic macro operations shall be cancelled for the chamber where the command is issued, and its valves shall be closed.

In case an emergency stop command is issued for a gate, the corresponding gate shall stop and the macros shall be cancelled for the chamber where the command is issued."

(GUPC-IAE-1745)
(IAE-UPC-1420)
(RFV-152)

18. **Volume II, Part 3, Section 01 57 19.13 [Environmental Management System]:**
Delete Paragraph 1.05 B.2 in its entirety and replace it with the following:

"2. **Air Quality:** This monitoring program shall include the activities required to monitor the quality of air in the working environment and in the surrounding ambient environment. Monitoring shall take place during construction activities in the area of José Dominador Bazán, Cocoli, and Monte Lirio at the frequency defined within the EslA; except NO_x which will be monitored in a biannual basis considering the conditions detailed below. PM₁₀ sampling (of particle matter of 10 microns or less in diameter) shall be at least once every six (6) days in each monthly period. The air-quality monitoring program shall be updated yearly on the basis of the results of the previous monitoring in order to adjust the work schedule as required. Gravimetric and passive techniques shall be used for PM₁₀ and NO_x, (nitrogen-oxide) testing. Monitoring methods shall be in conformance with the Employer's ambient air quality standard, 2610-ESM-109, and the results shall be compared with this standard.

1. Ambient air concentration of nitrogen oxides (expressed as nitrogen dioxide - NO₂) will be monitored at each Site, within the first month period, when the full capacity of the power generating plants is reached.



2. Ambient air concentration of nitrogen oxides (expressed as nitrogen dioxide - NO₂) will be monitored, at each Site, twice a year (for rainy and dry season). This monitoring will be conducted regardless of the generators' operational rates.

3. Monitoring periods of 24 continuous hours are accepted, for Conditions 1 & 2 above, provided that documentation is submitted to the Employer demonstrating that the method used for such monitoring is compliant with USEPA Reference and Equivalent Methods or with the European Union Directive for ambient air quality.

4. The Contractor will update the Monitoring Plan, indicating that a dispersion model will not be applied, and describing the methodology that will be applied considering the conditions 1, 2 and 3 above.

5. The Contractor accepts that the Employer may, at any time, based on the Contractor's and the Employer's monitoring results, request that the Contractor modify the nitrogen oxides monitoring frequency and/or conduct other specific monitoring tasks."

(GUPC-IAE-1898)
(IAE-UPC-1489)
(GUPC-IAE-1832)
(IAE-UPC-0811)
(GUPC-IAE-0930)
(IAE-UPC-0599)
(RFV-61A)

19. Volume II – Part 4 – In Drawing 5802-400, Note N-3 shall be revised to read:

"For all low 480V, 3 Ø switchboards or MCC, hardwired interlocks shall be furnished to inhibit local and remote operation of the tie breaker without opening one of the incoming breakers and the closing of the two incoming breakers when the tie breaker is closed. See ELR #4 for typical arrangement."

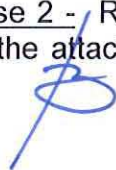
(IAE-GUPC-0189)
(RFI-0172)

20. Volume II – Part 4 – Drawing 5803-400, N-3 shall be revised to read:

"For all low 480V, 3 Ø switch boards or MCC, hardwired interlocks shall be furnished to inhibit local and remote operation of the tie breaker without opening one of the incoming breakers and the closing of the two incoming breakers when the tie breaker is closed. See ELR #1 for typical arrangement."

(IAE-GUPC-0189)
(RFI-0172)

21. Mindi Campsite – Phase 2 - Retrieval of the area located within the Contractor's Polygon, as shown in the attached Drawing SK-A-A-1016, and as defined by the



following coordinates:

POINT	NORTHING	EASTING
B05	1028950.029	620415.187
B02	1028946.825	620524.149
B03	1028981.270	620543.540
B06	1028986.044	620381.190

The date established for the release and transfer of responsibility of the defined area is August 12, 2013.

(IAE-UPC-1649)
(GUPC-IAE-2044)
(IAE-UPC-1613)
(GUPC-IAE-1950)
(IAE-UPC-1548)

There is no time or cost impact to the Locks Contract as a consequence of this Variation.



A

B

C

D

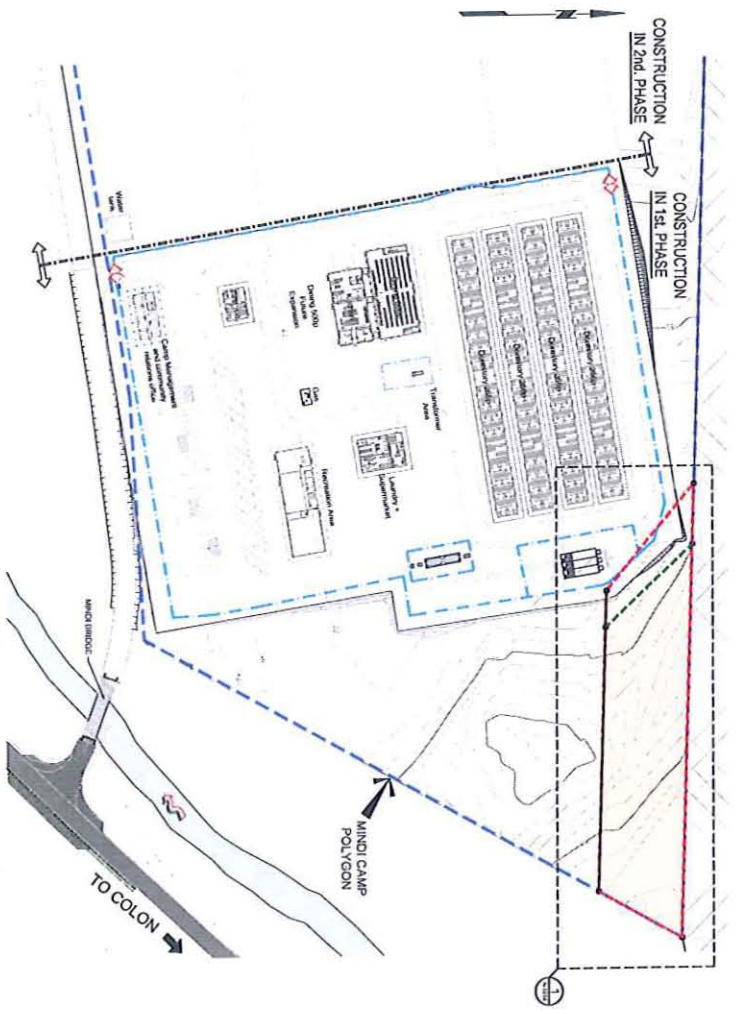
E

CONSTRUCTION
IN 1st PHASE

CONSTRUCTION
IN 2nd PHASE

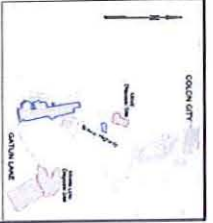
MINDI CAMP GENERAL PLAN

SCALE: 1" = 100'



KEY PLAN

SCALE: 1" = 100'



ACR COORDINATES	
N	EAST
101	101.000000
102	101.000000
103	101.000000
104	101.000000
105	101.000000
106	101.000000
107	101.000000
108	101.000000
109	101.000000
110	101.000000

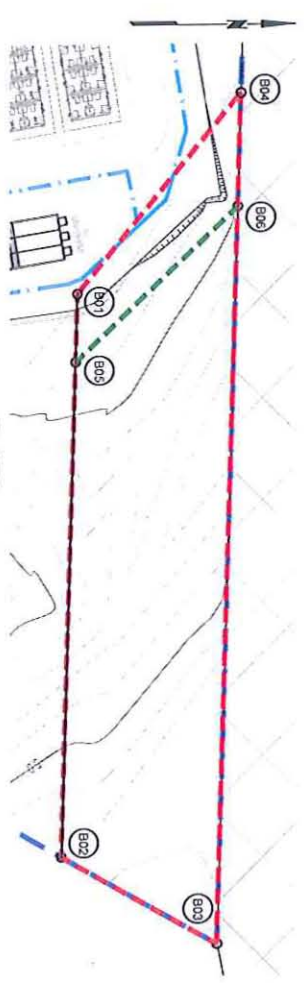
LEGEND

RED DASHED LINE	RESTRICTED HANDOVER AREA
BLUE DASHED LINE	RESTRICTED HANDOVER AREA
GREEN DASHED LINE	RESTRICTED HANDOVER AREA
YELLOW DASHED LINE	RESTRICTED HANDOVER AREA
PINK DASHED LINE	RESTRICTED HANDOVER AREA
BLACK DASHED LINE	RESTRICTED HANDOVER AREA

SKETCH

DETAIL

SCALE: 1" = 100'



ATLANTIC LOCK COMPLEX	
MINDI CAMP	
RESTRICTED HANDOVER AREA	
DATE	10/10/2010
BY	SK-A-1016

FILE: C:\WORK\1016\1016-01\1016-01-01\1016-01-01-01.dwg
PLOT: 10/10/2010, 10:10:10, 1016-01-01-01.dwg
PLOT: 10/10/2010, 10:10:10, 1016-01-01-01.dwg