

^{A19}**TECHNICAL**

PART 5 – Design Plan (2,500 Points). See the corresponding information in Volume V, Part 5, and the summary in Table 5 after the following text.

- A. **Tender Design for the Works (400 points).** The Tenderer shall show why the proposed Tender design for the Works — including both Atlantic and Pacific lock complexes: Atlantic and Pacific Approach Channels: and Borinquen Dams 2E, 1W, and 2W — represent the best alternative to meet or exceed the Employer’s Requirements of Section 01 10 00 (*General Project Requirements*) and satisfy the requirements cited in the corresponding paragraphs of Volume V, Part 5. Meeting the minimum requirements will result in an Evaluation Grade of “Good.” Proposals that offer substantiated added value to the Employer will result in a higher Evaluation Grade. The evaluation of the design will consider the following factors:
1. **General Configuration (50 Points).** The Tenderer shall demonstrate that the design proposal for the Works meets or exceeds the Employer’s Requirements. The drawings, design plan, and supplemental information submitted by the Tenderers shall be evaluated for effectiveness in communicating a clear understanding of the Employer’s Requirements. A maximum of 50 points are available for this element.
 2. **Operational Efficiency (70 Points).** The Tenderer shall demonstrate that the design proposal is functional and reliable, reflects the Employer’s Requirements, and will be effective with a minimal operating staff. A maximum of 70 points are available for this element.
 3. **Quality Assurance and Control (100 Points).** The Tenderer shall explain how the proposed QA/QC plan will result in a design that can be successfully implemented during construction of the Works. A maximum of 100 points are available for this element.
 4. **Design Programme (90 Points).** The Design Programme shall show the relationships between the main design, construction, and testing / commissioning components of the Works. It shall be evaluated on its meeting or exceeding the General Programme Requirements of Section 01 31 00 (*Project Management and Coordination*). A maximum of 90 points are available for this element.
 5. **Maintenance (90 Points).** The proposed configuration of lock structures, filling and emptying systems, gates, mechanical systems, electrical systems, and control systems shall meet or exceed the Employer’s Requirements in terms of durability, maintainability, and capacity. Details associated with ease of maintenance, time span between required preventive maintenance activity, and labor force requirements for maintenance activity will be evaluated. A maximum of 90 points are available for this element.
- B. **Approach Channels (100 Points).** ^{A20}Meeting the requirements of the corresponding paragraph of Volume V, Part 5, and the applicable requirements of Sections 31 23 00 (*Excavation and Fill*), 35 20 23 (*Dredging*) and 35 73 00 (*Borinquen Dams 2E, 1W, and 2W*) will result in an Evaluation Grade of “Good.”^{A20} Proposals that exceed these requirements and offer substantiated added value to the Employer will result in a higher Evaluation Grade. ^{A20}The evaluation of the Approach Channels will consider the following factors:^{A20}
1. ^{A20}**For both the Atlantic and Pacific Sites (50 Points):**^{A20} Calculations, drawings, and supplemental information submitted by the Tenderer will be evaluated for effectiveness in communicating a clear understanding of the Employer’s Requirements and satisfying the details cited in the corresponding section of Volume V, Part 5. Each Tenderer will be awarded points based upon the respective Evaluation Grade for this element of the proposal. ^{A20}A maximum of 50 points are available for this element.^{A20}

2. ^{A20}**Pacific Site (50 Points):** Calculations, drawings, and supplemental information submitted by the Tenderers will be evaluated for effectiveness in communicating a clear understanding of the requirements for the corresponding section of Volume V, Part 5, relating to Borinquen Dams 2E, 1W, and 2W. Each Tenderer will be awarded points based upon the respective Evaluation Grade for this element of the proposal. A maximum of 50 points are available for this element.^{A20}

C. Locks Civil Works (950 Points). Designs submitted with the proposals will be evaluated for the following factors.

1. **Excavation and Fill (55 Points). Tender Design:** The Tenderer shall explain why the proposed concept for excavation and fill represents the best alternative to meet or exceed the Employer’s Requirements. Meeting the requirements of the corresponding paragraph of Volume V, Part 5, and the applicable requirements of Section 31 23 00 (*Excavation and Fill*) will result in an Evaluation Grade of “Good.” Proposals that exceed these requirements and offer substantiated added value to the Employer will result in a higher Evaluation Grade. A maximum of 55 points are available for this element. Evaluation will also consider the substantiation of the Tenderer’s approach based on the following elements:
 - a. **Temporary Slope Stability.** Design considerations and supplemental information submitted by the Tenderers will be evaluated for effectiveness in communicating a clear understanding of and capability to achieve required slope stability. Compliance with all geotechnical and structural requirements will be evaluated, inclusive of slope stability and materials management.
 - b. **Permanent Slope Stability.** Geotechnical considerations and analysis submitted by the Tenderers will be evaluated for effectiveness in communicating a clear understanding of and capability to achieve required slope stability. Clear definition of materials management to achieve permanent stability is to be included.
 - c. **Drawings.** The Tenderer’s drawings will be evaluated on the basis of clearly demonstrating that they provide enough information to reveal compliance with the Employer’s Requirements and the design intent. Supplemental information submitted by the Tenderers or incorporated into the drawings as notes or callouts will be evaluated for effectiveness in enhancing communication of the design.
 - d. **Specifications.** Tenderer’s specifications for the excavation and fill will be evaluated for their thoroughness and clarity in effectively addressing the requirements of the corresponding categories listed in Volume V, Part 5.
2. **Geotechnical (120 Points).** Meeting the requirements of the corresponding paragraph of Volume V, Part 5 will result in an Evaluation Grade of “Good.” Proposals that exceed these requirements and offer substantiated added value to the Employer will result in a higher Evaluation Grade.
 - a. **Geotechnical Parameters for the Design (50 Points).** These shall be identified, mentioning relevant geotechnical information. They will be evaluated for the adequacy of meeting the Employer’s Requirements, compliance with standard geotechnical practice and demonstrating sound engineering judgment. A maximum of 50 points are available for this element.
 - b. **Geotechnical Research Plan and Analysis Method (70 Points).** The Tenderer’s research plan and analysis methodology will be evaluated for with the adequacy of meeting the Employer’s Requirements and compliance with standard geotechnical practice. A maximum of 70 points are available for this element. Each Tenderer will be awarded

points based upon the respective Evaluation Grade for this element of the proposal.

3. **Structures (250 Points). Tender Design:** Meeting the requirements of the corresponding paragraph of Volume V, Part 5, and the General Requirements of Section 01 81 16 (*Lock Structures*) will result in an Evaluation Grade of “Good.” Proposals that exceed these requirements and offer substantiated added value to the Employer will result in a higher Evaluation Grade. A maximum of 250 points are available for this element. Evaluation will also consider the substantiation of the Tenderer’s approach based on the following elements:
 - a. **Analysis Method.** The Tenderer’s description of the methodology to be used in design and its corresponding applicability will be evaluated for thoroughness and established historical merit. Submitted analyses will be evaluated for demonstration of design adequacy, compliance with specifications, and presentation.
 - b. **Design Methods, Codes, and Standards.** ^{A20}The Tenderer’s narrative submittal will be evaluated for completeness and clarity in defining effective design methodology, codes, and standards for use in design of the Works.^{A20} Further description as to how the level of design is appropriate for providing a structure that is compliant with the Employer’s Requirements completes this element.
 - c. **Results (Calculations).** The Tenderer shall submit a report with the results of the analysis and corresponding design in an organized manner to permit proper evaluation. The report shall separately cover the Atlantic and Pacific lock complexes and the various components within each complex.
 - d. **Drawings.** The Tenderer’s drawings will be evaluated on the basis of clearly demonstrating that they provide enough information to reveal compliance with the Employer’s Requirements and the design intent. Supplemental information submitted by the Tenderers or incorporated into the drawings as notes or callouts will be evaluated for effectiveness in enhancing communication of the design.
 - e. **Specifications.** Tenderer’s specifications for the major structures will be evaluated for their thoroughness and clarity in effectively addressing the durability of the structures, describing the structural requirements of the Materials, and correlating the functional requirements of the structures.
4. **Concrete (125 Points).** Meeting the requirements of the corresponding paragraph of Volume V, Part 5, and the General Requirements of Section 03 30 00 (*Concrete*) will result in an Evaluation Grade of “Good.” Proposals that exceed these requirements and offer substantiated added value to the Employer will result in a higher Evaluation Grade.
 - a. **Types (75 Points).** The Tenderer’s narrative will be evaluated for defining the types and mix designs of concrete to be used in the Works, the corresponding locations where the mixes are to be applied, source definition of the components of the concrete mixes, required/proposed admixtures or other additives, and demonstrating why the proposed concrete designs represent the best alternative to meet or exceed the Employer’s Requirements. A maximum of 75 points are available for this element.
 - b. **Specifications (50 Points).** Tenderers’ specifications for the concrete and related items will be evaluated on the thoroughness and clarity in effectively addressing the details of the corresponding Section in Volume V. A maximum of 50 points are available for this element.
5. **Filling and Emptying System (400 Points). Tender Design:** Meeting the requirements of the corresponding paragraph of Volume V, Part 5, and the Requirements of Sections 01 81 13 (*Filling and Emptying Systems*) and 01 81 13.13 (*Physical Model for Filling and Emptying*

System) will result in an Evaluation Grade of “Good.” Proposals that exceed these requirements and offer substantiated added value to the Employer will result in a higher Evaluation Grade. A maximum of 400 points are available for this element. Evaluation will also consider the substantiation of the Tenderer's approach based on the following elements:

- a. **Report on Tender Design and Numerical Model.** The Tenderers proposal will be evaluated for demonstrating that the proposed design and numerical model will yield a filling and emptying system that meets or exceeds the Employers Requirements. The information must be presented in an organized and easily understood manner to ensure comprehension by the reviewer.
- b. **Tender Design Drawings and Sketches of all Associated Modeling.** The Tenderer's material submitted under this element will be evaluated on the basis of clearly demonstrating that the Tenderer has provided enough information to reveal compliance with the Employer's Requirements and the design intent.
- c. **Calculations and Models Used to Determine Water-Reutilization Percentages and the Corresponding Results of the Modeling.** Calculations, model application/suitability, and supplemental information submitted by the Tenderers will be evaluated for demonstrating that the proposed calculations and models will yield water-reutilization percentages that meet or exceed the Employer's Requirements.
- d. **Report on the Maintainability of the System and the Safety Aspects Afforded Both Vessels and Operating and Maintenance Personnel.** The Tenderer's material submitted under this element will be evaluated on the basis of demonstrating that the maintainability and safety aspects of the proposed system meet or exceed the Employer's Requirements to have incorporated into the finished lock complexes an easily maintainable and safe system.

D. Lock Gate Design and Fabrication (350 Points).

1. **Tender Design (350 Points).** The Tender submittals listed in Volume V for this element will be evaluated for compliance with the Employer's Requirements. Proposals which exceed these requirements and offer substantiated added value to the Employer will result in higher evaluation grades. ^{A20}A maximum of 350 points are available for this element.
2. **(Reserved)**

E. Valves (200 Points). The Tenderer shall demonstrate why the configuration, design, and fabrication of the valves represent the best option to meet the Employer's Requirements.

1. **Tender Design (200 Points).** The Tender submittals listed in Volume V for this element will be evaluated for compliance with the Employer's Requirements. Proposals which exceed these requirements and offer substantiated added value to the Employer will result in higher evaluation grades. ^{A20}A maximum of 200 points are available for this element.
2. **(Reserved)**

F. Electrical (150 Points). The Tender submittals listed in Volume V for this element will be evaluated for compliance with the Employer's Requirements. Proposals which exceed these requirements and offer substantiated added value to the Employer will result in higher evaluation grades.

1. **Description of the Tender Design for the Power System (50 Points).** The Tenderer's narrative will be evaluated for effectiveness in responding to the specific items identified in the

corresponding paragraph of Volume V, Part 5. ^{A20}A maximum of 50 points are available for this element.^{A20}

2. One-Line Diagram for Each Lock Complex (100 Points). The Tenderer's one-line diagrams will be evaluated for their effectiveness in clearly displaying the low- and medium-voltage distribution arrangement at each lock complex — identifying the loads, redundancies, remote and local controls, and emergency power, and listing all of the technical characteristics of the equipment, as well as the parameters to be monitored (alarms), and the means of communicating monitored parameters. The system (and its components) will be evaluated in terms of efficiency, safety, usage, maintenance, and replacement requirements, as well as flexibility, versatility, redundancy, reliability, and standardization. ^{A20}A maximum of 100 points are available for this element.^{A20}

G. ^{A20}Control Systems (250 Points).^{A20}

1. Locks Machinery Control System (LMCS) (125 Points). The tender submittals listed in Volume V for this element will be evaluated for compliance with the Employer's Requirements. Proposals which exceed these requirements and offer substantiated added value to the Employer will result in higher evaluation grades. A maximum of 125 points are available for this element.

2. Electrical Distribution Control System (EDCS) (65 Points). The tender submittals listed in Volume V for this element will be evaluated for compliance with the Employer's Requirements. Proposals which exceed these requirements and offer substantiated added value to the Employer will result in higher evaluation grades. A maximum of 65 points are available for this element.

3. Integrator's Past Performances and Competencies (60 Points). ^{A20}Submission of the cited information in the corresponding paragraph of Volume V constitutes a compliant response to this element and will result in the award of 60 points.^{A20}

H. Fender Systems (100 Points). Meeting the requirements of the corresponding paragraph of Volume V, Part 5, and the applicable General Requirements of Section 01 81 16.16 (*Locks Appurtenances*) will result in an Evaluation Grade of "Good." Proposals that exceed these requirements and offer substantiated added value to the Employer will result in a higher Evaluation Grade. ^{A20}A maximum of 100 points are available for this element.^{A20}

Table 5

Refer to Volume V, Part 5 Design Plan	Element	Points available	Element	Points available	Element	Points available	Total score
A. Tender Design for the Works	General configuration: General drawings showing that the Tenderer has understood all the Employer's Requirements as described in the performance specifications.	50	Operational efficiency: Demonstrate that the design proposal is functional and reliable, based on the Employer's Requirements, and requires a minimum operational staff. Power usage and manpower requirements will be considered.	70	Quality assurance and control: Demonstrate competence and corporate strength in quality management. Experience, examples, organization, and proposed plan for lock complexes will be evaluated.	100	220
	^{A20} Design Programme: ^{A20} Shows the relationships between the main design, construction, and testing / commissioning components of the project.	90	Maintenance: The proposed configuration of lock structures, filling and emptying systems, gates, mechanical systems, electrical systems, and control systems represent an alternative that meets the Employer's Requirements in terms of durability, maintainability, and capacity.	90			180
B. Approach channels	^{A20} Both Atlantic and Pacific Sites: ^{A20} Calculations, drawings, and supplemental information showing the understanding and satisfaction of requirements for the proposed channel configuration.	50	^{A20} Pacific Site: Calculations, drawings, and supplemental information showing the understanding and satisfaction of requirements for the construction of Borinquen Dams 2E, 1W, and 2W. ^{A20}	50			100
C. ^{A20}Locks Civil Works - Excavation and Fill^{A20}	Tender Design. ^{A20} Explain why the proposed concept for excavation and fill represents the best alternative. ^{A20}	55					55
C. ^{A20}Locks Civil Works - Geotechnical^{A20}	Geotechnical parameters for the design: To be identified, mentioning relevant geotechnical information, and will be evaluated for compliance with specifications.	50	Geotechnical research plan and analysis method: ^{A20} Adequacy of meeting the Employer's Requirements and compliance with standard geotechnical practice and demonstrating compliance with standard geotechnical practice. ^{A20}	70			120

Refer to Volume V, Part 5 Design Plan	Element	Points available	Element	Points available	Element	Points available	Total score
C. ^{A20} Locks Civil Works - Structural ^{A20}	^{A20} Structures: Tender Design. Description of analysis methods, Codes, Standards and Results. Provide Drawings and Specifications that clearly demonstrate the design intent. ^{A20}	250					250
C. ^{A20} Locks Civil Works - Concrete ^{A20}	Types: Identify the different types of concrete to be used in the Works, where the different mixes will be used, and the corresponding mix designs.	75	Specifications: Address the requirements in the RFP.	50			125
C. ^{A20} Locks Civil Works - Filling and Emptying Systems ^{A20}	Tender Design. ^{A20} Provide report on Tender design and numerical model, Tender design drawings, and sketches of all associated modeling. Calculations and models used to determine water- reutilization percentages and the corresponding results of the modeling. Report on the maintainability of the system and the safety aspects afforded both vessels and operating and maintenance personnel. ^{A20}	400					400
D. Gates	Tender design. Compliance with requirements and substantiated added value.	350					350
E. Valves	Tender design. Compliance with requirements and substantiated added value.	^{A20} 200 ^{A20}	^{A20} (Deleted text)	----- ^{A20}			200
F. Electrical	Description of the Tender design for the power system.	50	One-line diagram for each lock complex.	100			150
G. ^{A20} Control Systems ^{A20}	Locks Machinery Control System (LMCS)	125	Electrical Distribution Control System (EDCS)	65	Competencies of the proposed system's integrator.	60	250
H. ^{A20} Fender Systems ^{A20}	Demonstrate understanding and satisfaction of requirements and compliance with requirements and design intent.	100					100
TOTAL - Design Plan							2,500

END OF SECTION^{A19}