Market Survey Questionnaire (RFI)

Design, Construction and Supply of One (1) Caisson for the Panama Canal

1. Purpose, Scope and Response Instructions

The Panama Canal Authority (ACP) is evaluating the design, construction, testing, certification and supply of one (1) new Caisson intended for lock closure, watertight isolation and dewatering operations.

The objective of this RFI is to collect high-level market information from qualified shipyards, naval architects, integrators and specialized suppliers to support future scope definition, cost benchmarking, delivery planning, risk allocation and procurement strategy.

Responses may be provided in narrative and/or tabular format. Partial responses are acceptable where detailed information is not available at this market survey stage. Respondents may propose superior or equivalent technical alternatives when the benefits, assumptions and deviations are clearly identified.

- Please state all assumptions, exclusions and dependencies used in the response.
- Where a range is requested, provide an indicative range and identify major cost or schedule drivers.
- Attach brochures, outline drawings, reference project lists and datasheets for major equipment where available.
- Use the response templates in Section K when possible, to improve comparability between respondents.

1.1. Reference Concept

- The quantities of pumps and valves included in reference material shall be treated as a baseline for comparison and understanding of the current operation, not as a fixed design constraint.
- The respondent shall propose and justify the required number, type, arrangement and redundancy philosophy for pumps, valves and auxiliary systems needed to achieve the required performance, operational safety and maintainability.
- The respondent shall confirm interface compatibility with the dry dock / lock seat geometry and identify any interface risks or verification data required before a formal quotation.

2. Baseline Technical Requirements

2.1. Principal interface dimensions

Parameter	Reference value	Approximate SI / note
Molded depth / puntal de trazado	64 ft 11.5 in	approx. 19.80 m
Molded breadth / width	112 ft	approx. 34.14 m
Depth	32 ft	approx. 9.75 m
Seat and keel geometry	Per ACP reference drawing / image	Dry support interface

2.2. Lock dewatering / pumping system

Parameter	Minimum / reference requirement
Total pumping capacity	32,000 m3/h in dry well condition
Pump quantity	Respondent design option. Existing/reference baseline: four submersible pumps of 8,000 m3/h each. Proposal shall justify quantity, arrangement, redundancy and maintainability.
Reference operating point per pump	8,000 m3/h at 12 m head; BEP greater than 80%. Equivalent configurations may be proposed if total performance is achieved.
Electrical voltage reference	2.4 kV, subject to electrical design validation
Suction / discharge	Double suction and discharge or equivalent configuration

Control	VFD/VDF + PLC
Instrumentation	Pressure transmitters, flow meters, level sensors and operational alarms
Current asset reference	Approximate current capacity to be exceeded: 14,000 m3/h

2.3. Ballast, refloating and watertightness

Parameter	Minimum / reference requirement
Ballast valves	Respondent design option. Existing/reference quantity and arrangement may be shown only for comparison. Proposal shall justify valve type, quantity, location, actuation and arrangement.
Valve standards	Compliance with ABS, DNV, Lloyd's Register, BV or equivalent classification society requirements, as applicable.
Actuation	Electric actuators or equivalent marine/submersible solution where applicable.
Auxiliary refloating pumps	Respondent design option. Existing/reference baseline: two pumps in alternating duty. Proposal shall justify capacity, quantity and redundancy.
Watertightness	Molded special rubber seals or equivalent/improved solution.
Fenders	Side berthing/contact protection during maneuvers.

2.4. Piping, materials and welding

Parameter	Minimum / reference requirement
Piping material	High-strength AH36/DH36 steel or equivalent/superior alternative, e.g., GRE, certified by a classification society.
Selection criteria	Corrosion resistance, low head loss, inspectability and maintainability.
Structural welding	Continuous welded connections according to applicable code, e.g., AWS D1.1 / class rules.
Traceability	Material certificates, origin documentation and test records for critical components.

2.5. Applicable Standards and Certification

Reference	Description / expected use
IACS	Shipbuilding and Repair Quality Standard
BV NR612	Rules for the classification of harbour equipment
UFC 4-213-10	Graving Dry Docks
ISO 8501-1	Surface preparation - cleanliness grade
ISO 8502-6 / ISO 8502-9	Assessment of soluble salts
ISO 8503-2	Surface roughness profile
AWS D1.1	Structural Welding Code - Steel
ABS / DNV / Lloyd's Register / BV	Applicable classification rules according to proposed class and certification scope

Note: The Caisson shall be certified by a recognized classification society. Respondents shall identify the proposed class society, certification scope, applicable notations/rules and any deviations or recommendations relevant to this project.

Market Survey Questionnaire

A. Company experience and reference projects

1. How many years of experience does your organization have in the design, construction and supply of caissons, floating gate structures, lock/dry dock closure structures, or comparable marine steel structures?
2. How many comparable projects has your organization engineered, built, integrated or supplied during the last ten (20) years? Please provide project names, year, main dimensions, operating environment, class/certification and client/region where disclosure is permitted.
3. Do you normally act as main contractor, shipyard, designer, OEM integrator, specialist subcontractor, or a combination of these roles? Please describe your preferred contracting model.

B. Technical feasibility and interface validation

4. Confirm whether the reference dimensions and interface concept are feasible for construction, operation, seating, sealing, handling and maintenance. Identify interface risks and information required from ACP to validate compatibility.
5. Identify the minimum technical information you would require from ACP to prepare a reliable proposal, including drawings, survey data, load cases, operating procedures, water levels, docking constraints and site limitations.
6. If possible describe any alternative concept or construction method that could improve maintainability, reliability, safety or delivery schedule while maintaining ACP interface requirements.

C. Classification, standards and quality assurance

7. Do you work with IACS member classification societies for comparable marine structures? If yes, identify typical societies, rules, notations and certification deliverables.
8. Which standards would you propose for structure, welding, coatings, electrical systems, automation, valves, pumps and testing?
9. Describe your quality assurance and test plan for material traceability, welding, NDT, dimensional control, pressure/leak testing, functional tests and class inspections.

D. Pumping / dewatering system

10. Indicate a preliminary pumping configuration to achieve 32,000 m3/h in dry well condition, including number of pumps, type, duty/standby philosophy, head, efficiency, controls and redundancy.
11. Confirm whether the existing/reference arrangement of four 8,000 m3/h pumps is technically appropriate or whether a different arrangement is recommended. Explain the basis for the recommendation.
12. Describe typical FAT/SAT/commissioning tests for pumps, motors, VFDs, controls, instrumentation and integrated dewatering performance.

E. Ballast, deballast, refloating and sealing systems

13. Recommend the number, type, size, location and actuation method for ballast/deballast valves. Explain fail-safe behavior.
14. Describe recommended refloating pump configuration
15. Describe the proposed sealing system against the lock/dry dock interface, including type of rubber seal or alternative.
16. Identify acceptance tests for watertightness, valve operation, refloating, seating/sealing, emergency operation and manual/local control.

F. Electrical, automation, control and monitoring

17. Describe the proposed control architecture.
18. Which operations can be automated or semi-automated: pumping, ballast/deballast, refloating, alarm response, safety interlocks and operating sequences?
19. Describe fail-safe behavior and manual/local operation in case of power, control, communications or actuator failure.
20. What variables should be monitored to ensure stable, safe and maintainable operation? Include recommended sensors and alarm thresholds where possible.

21. Can a structural monitoring / SMART system be provided? Describe scope, sensor types, data logging, alarms, dashboards, maintenance integration and ownership of data.

G. Digital model, documentation and software access

22. Can you provide an as-designed and as-built 3D model of the Caisson? Identify formats, level of detail, editable deliverables and use restrictions.
23. Can a digital twin or digital maintenance model be provided for long-term operation and maintenance? Describe covered systems, data sources, software platforms, licensing and cybersecurity considerations.

H. Schedule, construction strategy and trials

24. What proposal preparation period is typically required after a formal RFP for a comparable project? Distinguish between budgetary and firm proposals if applicable.
25. Provide an indicative delivery schedule from contract award / notice to proceed to final acceptance, including design, procurement, fabrication, assembly, integration, FAT, launch/float-out, trials, transport and Panama acceptance if applicable.
26. Identify long-lead items such as steel, pumps, valves, actuators, PLC/VFD components, seals, coatings, class approval or shipyard slot reservations.
27. Describe typical FAT, HAT/harbor or dock trials, leak/seal tests, functional tests, load tests, class inspections and final acceptance tests.
28. Identify site, transport, towing, delivery, Incoterm or logistics assumptions that could affect schedule or price.

I. Commercial, pricing, payment and securities

29. Provide an indicative cost range for a Caisson of comparable size and complexity.
30. Identify major cost drivers, including steel, shipyard slot, pumps, valves, actuators, controls, coatings, certification, automation level, redundancy, logistics and warranty/support.
31. Comment on typical payment structures for comparable marine fabrication projects. Include advance payments, milestones, retention, final acceptance and securities required to protect advance or progress payments.
32. Identify any proposal bond, performance bond, advance payment guarantee, warranty bond, insurance or retention mechanisms commonly required or recommended.

J. Warranty, support, spare parts and lifecycle

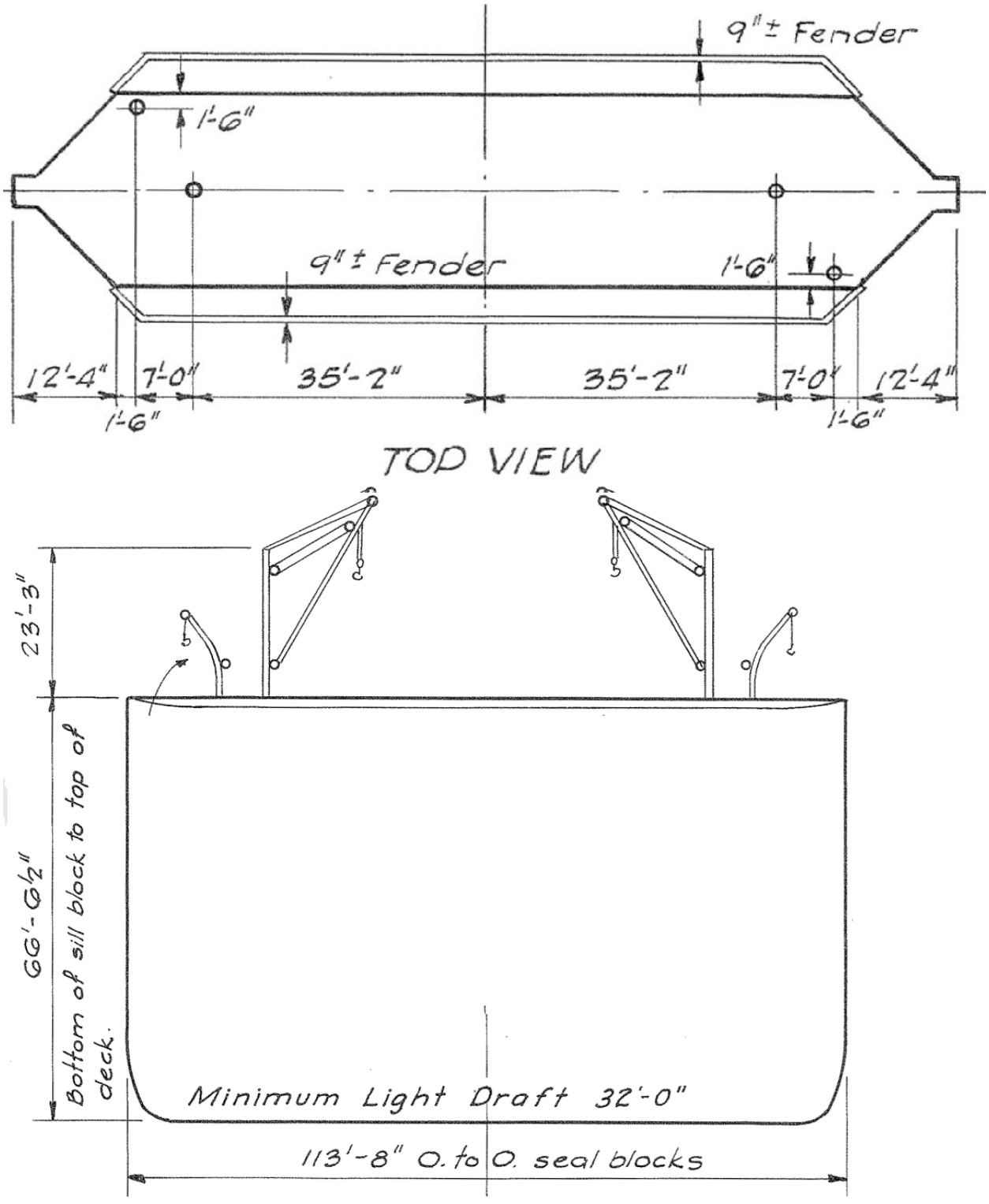
33. Describe typical warranty period, covered systems, exclusions, remedies, response times, extended warranty options and any performance or availability guarantees.
34. Describe long-term service support, including local/regional support, remote diagnostics, field service, training, repair/overhaul, spare parts availability and obsolescence management for automation/control components.
35. Identify expected service life under normal operation and the main conditions that could reduce or extend useful life.

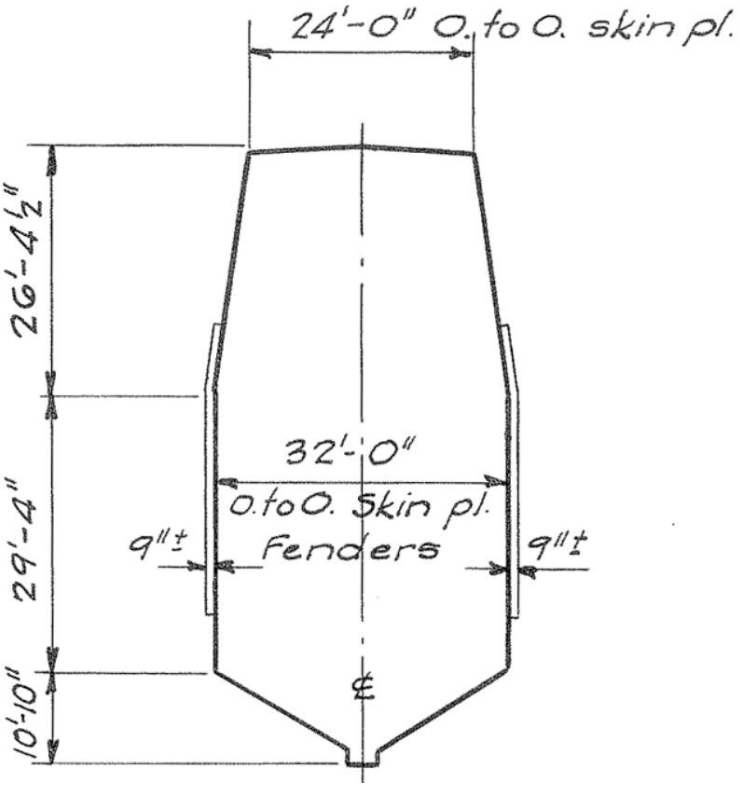
K. Reference projects table

Project / asset	Year	Main dimensions / capacity	Function	Class / certification	Scope supplied	Client / region

Appendix A - Reference Drawing / Image

Caisson No. 2 - General Arrangement. Geometric and functional reference of the existing unit. Dimensions shall use as reference.




24'-0" O. to O. skin pl.
26'-4½"
29'-4"
10'-10"
32'-0"
O. to O. Skin pl.
Fenders
9" ±
9" ±
℄