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Scope of Work

1. Overview

- 1.1. The Owner has purchased two (2) new 6000 kg overhead refuse cranes with 17.5 meter spans and all the associated equipment and control systems to replace two (2) similar overhead refuse cranes located above the refuse bin near the Tipping Hall and originally installed in 1992.
- 1.2. The Successful proponent shall provide professional engineering, detailed design, coordination and construction services for the safe removal of two (2) existing 17.5m x 6000 kg overhead refuse cranes as well as all of their associated equipment and the complete installation of two (2) new 17.5m x 6000 kg overhead refuse cranes and all their associated equipment.
- 1.3. In addition to the new cranes the Owner has purchased 98 meters of ASCE 80 lbs crane rails to be installed after the existing rails are removed by this Contractor.
- 1.4. The Contractor shall remove the existing cables and control wiring from the MCC room to the cranes and control room and supply and install new cables and control wiring. The existing control seats in the control room shall be removed and new seats installed in the same locations.
- 1.5. These cranes, their associated equipment and the rails will be shipped to Tynes Bay in several containers and flatbed trailers arranged by the Owner. The scheduled crane delivery date is April 5, 2024, FOB, Tynes Bay Waste to Energy Facility. This date must be considered to be an estimate and it will be confirmed as the cranes are being fabricated and a sailing date is fixed. There may be several different shipments to be dealt with.
- 1.6. This Contractor will receive, unload the containers and trailers, take control of the shipments including securing them and protecting them from the weather and damage. Outside storage areas will be made available at the Tynes Bay Facility.
- 1.7. The Contractor, along with a witness from the Owner, shall confirm receipt of the equipment in good order or prepare detailed documents to record short falls or damage.
- 1.8. The crane fabricator has provided detailed documents including material lists and shop drawings for the equipment to be installed as well as the materials to be supplied and installed by this Contractor. This information, as well as the existing building drawings are available on request from the RFP Contact, Mr. Nasir Wade at email nrwade@gov.bm.
- 1.9. A representative from the crane fabricator will be available during the installation to review and inspect the installation as it progresses. This representative will be available as a technical resource person but they will not be responsible for any decisions made by others based on their advice. All these responsibilities remain with the Contractor as part of their means and methods.
- 1.10. Access to the existing cranes is awkward and the Contractor or their sub-contractors with experience in heavy rigging or can demonstrate experience working safely under similar conditions will be essential. Working at heights, in confined spaces as well as in dusty, hot and humid conditions, in an operating plant, will be required.

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- 1.11. The Contractor is expected to complete all the work while the existing Facility remains in operation. A very detailed and comprehensive construction plan will be required and agreed with the Owner prior to work beginning on site.
- 1.12. One of the existing cranes is not operating and its removal and disposal could be scheduled in advance of the arrival of the new cranes. The crane removal could also include its control panels in the MCC room, removal of the festoon system and any other equipment that will not affect the working crane to remain in operation.

2. Mobilization

- 2.1. Mobilize a work crew and all equipment to complete the Works.
- 2.2. The Contractor shall meet with Tynes Bay Operations to confirm laydown areas, set communications channels and facility use coordination to prevent delays before work begins on site.
- 2.3. The Contractor shall coordinate safety and health programs with Tynes Bay Operations.
- 2.4. Document the pre-mobilization conditions of the site and laydown areas and provide a copy to Tynes Bay operations.

3. Engineering Design for the Existing Crane Removals

- 3.1. The Contractor must be aware and take every precaution to prevent damage to the facility that would prevent processing the refuse.
- 3.2. The Facility was constructed in 1992 and it should be expected that some deterioration may have occurred to the structure that may reduce its structural capacity and which must be taken into consideration by the Contractor.
- 3.3. To this end, the Contractor shall prepare a detailed plan for the safe removal of the cranes and their associated equipment. It will clearly define how the cranes will be decommissioned, rigged and removed from the building. The Contractor will present this plan to the Owner for review before any work begins.
- 3.4. The Contractor shall review the existing site conditions and plant operations so that they are fully aware of the existing conditions as well as working in and around the facility.
- 3.5. The Contractor shall be working with or exposed to high voltage electrical systems during the equipment removals and every precaution must be taken to isolate and/or de-energized each and every circuit to be removed.
- 3.6. The Contractor shall prepare detailed designs complete with detailed calculations and stamped engineering drawings showing the proposed Temporary Works Plan to remove the two existing cranes in a safe manner.

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- 3.7. Temporary work is defined as works designed, constructed, installed, and removed by the Contractor which are needed for construction or installation of the Works.
- 3.8. The Temporary Works Plan shall clearly show the magnitude and locations of all vertical and horizontal loads on the existing building and confirm that no damage will occur because of the imposed loading. This also includes the location of crane outriggers and their pads to avoid overloading the Structure.
- 3.9. The Temporary Works Plan shall clearly show the type of materials to be used, details for the connections, bracing locations, leg support pad sizes, access ladders, hand railing, kick plates, deck planking and of the physical condition of the materials assumed in the design calculations, i.e. new, lightly used, etc.
- 3.10. The proposed Temporary Works Plan complete with a Professional Engineer's stamp shall be reviewed by the Ministry or their designated Engineer to confirm that the proposed plan will not cause damage to the Facility and meets all Safety and Health requirements. The final design responsibility will remain with the Contractor.
- 3.11. The Professional Engineer shall be on-site or immediately available to review and inspect the Contractor's rigging to confirm the means and methods are conforming to the Engineer's design before the lifting loads are imposed on the structure.
- 3.12. Any items found not to be in accordance with the Temporary Works Plan shall be reconfigured to conform to the Plan and re-inspected by the Professional Engineer.
- 3.13. The Professional Engineer shall provide a written report to the Owner detailing the non-conformance, the rectification procedure, and confirmation that the revised Plan is being followed before the lifting loads are imposed on the Structure.
- 3.14. If the Plan is not being followed but the process is deemed by the Professional Engineer to be safe then the original Temporary Works Plan shall be revised and resubmitted for review by the Owner before the lifting loads are imposed on the Structure.

4. Engineering Design for Installing the New Cranes

- 4.1. The Contractor must be aware and take every precaution to prevent damage to the facility that would prevent processing the refuse.
- 4.2. The Facility was constructed in 1992 and it should be expected that some deterioration may have occurred to the structure that may reduce its structural capacity and which must be taken into consideration by the Engineers.
- 4.3. To this end, the Contractor shall prepare a detailed Installation Plan for the safe installation of the cranes and their associated equipment. It will clearly define how the new cranes, the new rails, and the multiple power and control systems will be installed in their final positions while the facility continues to process the refuse. The Contractor will present the Installation Plan to the Owner for approval before any work begins.

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- 4.4. As a minimum, the detailed Installation Plan shall include;
 - 4.4.1. Preparing the crane rail beams to receive the new rails including inspecting the beam connections and reporting any issues.
 - 4.4.2. It will clearly define how the rails shall be installed to meet the vertical and horizontal alignment limits in accordance with the standards listing in the Tender documents.
 - 4.4.3. It will clearly detail how the cranes will be installed on the crane rails including how the cranes will enter the building, raised to their final position and installed on the rails.
 - 4.4.4. The Installation Plan shall include the proposed methods to be used to install the refuse grabs and their associated equipment.
 - 4.4.5. It will clearly define the installation of the control panels in the MCC room including how the room will be accessed and how the panels will be connected.
 - 4.4.6. The Installation Plan will define how the cables will be routed and installed to connect the equipment with the control systems including the festooning cables and their supports as well as all the control systems including the limit switch components.
 - 4.4.7. Any openings in the walls or roof of the Facility for access to the equipment shall be repaired and made weather tight using all new materials. The removed materials shall not be reused without the Owners written approval.
 - 4.4.8. No permanent structural steel members shall be removed for any part of the Works without the Owner's written approval. Typically, approval to remove any structural member will require detailed design notes and drawings from a Professional Engineer to confirm there will be no impact on the structure. The request shall include detailed instructions on when lifting must be stopped and/or the members must be reinstated during high winds or any other conditions that would lead to damage to the facility.
 - 4.4.9. The Contractor will present this plan to the Owner for review and approval to proceed before any work begins.
- 4.5. The Contractor shall review the existing site conditions and plant operations so that they are fully aware of the existing conditions as well as working in and around the facility.
- 4.6. The Contractor shall be working with or exposed to high voltage electrical systems during the equipment removals and every precaution must be taken to isolate or de-energized each and every circuit before it is energized. A detailed tag out/lock out system must be followed rigorously.
- 4.7. The Contractor shall prepare detailed designs complete with detailed calculations and stamped engineering drawings showing the proposed Installation Plan to install all the new crane systems in a safe manner.

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- 4.8. The Installation Plan shall clearly show the magnitude and locations of all vertical and horizontal loads on the existing building and confirm that no damage will occur because of the imposed loading. This also includes the location of crane outriggers and their pads to avoid overloading the Structure.
- 4.9. The Installation Plan shall clearly show the type of materials to be used, details for the connections, bracing locations, leg support pad sizes, access ladders, hand railing, kick plates, deck planking and of the physical condition of the materials assumed in the design calculations, i.e. new, lightly used, etc.
- 4.10. The proposed Installation Plan complete with a Professional Engineer's stamp shall be reviewed by the Ministry or their designated Engineer to confirm that the proposed plan will not cause damage to the Facility and meets all Safety and Health requirements. The final design responsibility will remain with the Contractor.
- 4.11. The Professional Engineer shall be on-site or immediately available to review and inspect the Contractor's rigging to confirm the means and methods are conforming to the Engineer's design before the lifting loads are imposed on the structure.
- 4.12. Any items found not to be in accordance with the Installation Plan shall be reconfigured to conform to the Plan and re-inspected by the Professional Engineer.
- 4.13. The Professional Engineer shall provide a written report to the Owner detailing the non-conformance, the rectification procedure, and confirmation that the revised Installation Plan is being followed before the lifting loads are imposed on the Structure.
- 4.14. If the Plan is not being followed but the process is deemed by the Professional Engineer to be safe then the original Installation Plan shall be revised and resubmitted for review by the Owner before the lifting loads are imposed on the Structure.
- 4.15. The Contractor shall prepare a detailed Installation Plan for the safe installation of the cranes and their associated equipment while maintaining the facilities ability to process refuse in the usual manner.

5. Construction Management Plan

- 5.1. Review the existing site conditions and facility operations.
- 5.2. The Contractor shall prepare a Construction Management plan detailing the work and the schedule required to complete the Works.
- 5.3. It is the intention of the Operations team to continue operating the facility during the construction phase of this work so innovative approaches to minimise plant down time are encouraged and will be required. Down time for the facility is not an option.

6. Decommissioning of Existing Refuse Crane, Rails and Systems

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- 6.1. The Contractor shall be responsible for the complete demolition of all associated Refuse Crane equipment, parts and accessories. This includes but is not limited to the refuse cranes, trolley, grab system, rail system, electrical systems, control systems and associated auxiliary equipment.
- 6.2. The Contractor shall be responsible for disassembly of all equipment and transport of dissembled equipment into waste skips provided by Government which will be onsite. See further details below.
- 6.3. Tynes Bay Waste to Energy Facility shall provide a large waste skip for all equipment, metal and debris to be placed. Any containing oil or fluids shall be drained in accordance with the Bermuda Environmental standards, laws and procedures.
- 6.4. All waste generated as a result of the decommissioning process are to be disposed of properly in accordance with the Bermuda Environmental standards, laws and procedures.

7. Installation 80lb ASCE Runway Rail System

- 7.1. The Contractor shall install 2 x 49m, Owner supplied. 80lb ASCE runway railing. The new rails shall replace the existing rails and they extend from the south end stops to the north end stops.
- 7.2. The rails shall be installed in accordance with guidelines and meet acceptable tolerances per the Crane Manufacturers Association of America, Inc. and the American Institute for Steel Construction, specifically, CMAA Specification No. 70-2020 Specifications for Top Running Bridge and Gantry Type Multiple Girder Electronic Overhead Traveling Cranes.
- 7.3. The Owner supplied rails will be supplied in accordance with the shop drawings supplied in the Tender documents.
- 7.4. It is the Owners intention to supply the new rails with clips so the existing bolt holes in the crane beams can be re-used. Contractor shall allow for drilling about 20 new holes in the existing crane rail beams to accommodate the new rail fasteners, as required.
- 7.5. The joints in the rails must be flush and aligned but they will not be butt welded. Rail joints will have fish plates to be installed and the scarf joints shall be offset from each other.
- 7.6. The final elevation of the rails will be consistent along their length and between both ends of the crane.
- 7.7. It is expected that the crane stops will have to move about 700mm+/- towards the north and the south so the grabs can be lowered into their maintenance area. The exact location of the crane stops will be determined on site. New holes will be required to be drilled in the crane beams and new bolts installed.
- 7.8. The existing crane rail inspection is included in an Appendix with these documents as a reference document only.

8. Cranes – Konecranes America

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- 8.1. The Owner has purchased two (2) new cranes and four (4) new refuse grabs and the associated equipment and controls from Konecranes America.
- 8.2. Some of the equipment will be shipped to the site in 20 foot containers and they will be “knocked down” to fit into the space. An example of this are the grabs that will be shipped with their orange peel blades not connected to the body and the hydraulics shipped loose. The Contractor will be required to handle and assemble the equipment as part of the Works.
- 8.3. The Konecranes America proposal is included in an Appendix to these documents. The Konecranes America proposal details their scope of supply and what is to be supplied by the Contractor for installation. It details items or services not included in their crane scope of supply which will become part of this contract.
- 8.4. The Contractor shall review the Konecranes America scope of supply and incorporate it in their works. Items or services not included in their scope of supply must be included in the work and completed by this Contractor by providing the personnel, equipment and materials necessary to complete the works.
- 8.5. The Owner has hired a representative from Konecranes America to provide experience and advice for installing Konecranes’ Overhead Refuse Cranes and the associated equipment. This representative will not direct or instruct your crews on installing the equipment but will be available to assist during the planning of the works and during the works as a technical resource. Their prime function is to ensure the cranes and their systems are installed properly.
- 8.6. Konecranes America contact information:
 - Konecranes America, 7300 Chippewa Blvd, Houston, TX 77086, +1-281-445-2225
 - Randy Cantrell, +1-865-385-4981, randy.cantrell@konecranes.com
 - Peter Jones, +1-610-637-7596, peter.jones@konecranes.com

9. Component and System Testing Programme

- 9.1. A detailed plan for testing all components and system shall be prepared and submitted for review.
- 9.2. All components shall be tested as they are installed to ensure they are operating as expected and in compliance with the design parameters.
- 9.3. After all the components in a system are tested and operate properly can all systems be completed and tested to ensure they are operating as expected and in compliance with the design parameters.
- 9.4. A log detailing the results of the testing programme shall be submitted for review and acceptance before any Commissioning shall be permitted to begin. The log shall include component and system fails and the corrective measures used to rectify the errors. This log shall be included with the as-built documentation.

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10. System Commissioning Programme

- 10.1. A complete and thorough commissioning programme shall be prepared and submitted for review and approval before commissioning begins.
- 10.2. After all components and systems have been tested and the testing log has been approved, commissioning of the Overhead Crane Systems may begin.
- 10.3. If during the course of the commissioning a component or system error or other unexpected event occurs the error shall be rectified, re-tested, documented and reviewed before commissioning continues.
- 10.4. After an error has been identified and rectified the commissioning process shall be re-started at the beginning to confirm that no other errors have been incorporated as a result of the component or system correction.
- 10.5. A detailing commissioning log showing the results of the commissioning programme shall be submitted for review and acceptance. The log shall include component and system fails and the corrective measures used to rectify the errors. This log shall be included with the as-built documentation.

11. Crane Load Testing

- 11.1. The Contractor shall assist with load testing of both cranes under the direct supervision of the crane manufacturer's representative.
- 11.2. The Contractor shall provide personnel and equipment to physically perform the load testing including rigging the dead weights to be lifted. This may include removing the grabs if they are installed.
- 11.3. The dead loads will be provided by the Owner and located in the Tipping Hall. The load test will require steel weights to be lifted in three or four stages while deflection measurements are recorded until a total crane dead load lift of 7500 kg is reached. In addition to a vertical lift the loads may travel across the refuse bin area.
- 11.4. When the testing has been completed the Contractor shall remove the loads and rigging, install or reinstall the grabs and return the weights to the Tipping Hall area.

12. Installation and Testing of a 4 Tonne Grab Maintenance Hoist

- 12.1. An Owner supplied 4 tonnes grab maintenance hoist shall be installed and tested by the Contractor.
- 12.2. The hoist will arrive to site in the same shipments as the new cranes. The Contractor shall be responsible for unloading and protection of the hoist.

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- 12.3. The crane shall replace the existing 3 tonne hoist located on Level 6 of the maintenance area under the grab maintenance shed using the same hoist beam.
- 12.4. The Contractor shall include all associated panel, controls, and underground conduit and wiring to connect the hoist to the existing facility. The electrical connections shall include a connection for the existing clinker crane grabs so all grabs can be connected to a common control panel and maintained at the same facility.
- 12.5. The details of the hoist are available on request per the technical section of these documents.

13. De-mobilization

- 13.1. Demobilize the work crew and all their equipment from the facility, including local transportation costs and return flights.
- 13.2. Return the site to the pre-mobilization conditions.
- 13.3. Obtain hand over sign off from Tynes Bay Operations confirming that the construction site and lay down areas are returned in pre-mobilization conditions, clean of all debris and construction equipment.