



**REQUEST FOR PROPOSAL /  
DEMANDE DE PROPOSITION**

**RETURN BIDS TO /  
RETOURNER LES SOUMISSIONS À:**

Bid Receiving – PWGSC / Réception des  
soumissions - TPSGC  
11 Laurier St. / 11 rue Laurier  
Place du Portage, Phase III  
Core 0B2 / Noyau 0B2  
Gatineau  
Québec  
K1A 0S5

**Proposal To: National Defence Canada**

We hereby offer to sell to Her Majesty the Queen in  
right of Canada, in accordance with the terms and  
conditions set out herein, referred to herein or  
attached hereto, the goods and services listed herein  
and on any attached sheets at the price(s) set out  
therefore.

**Proposition à : Défense nationale Canada**

Nous offrons par la présente de vendre à Sa Majesté la  
Reine du chef du Canada, aux conditions énoncées ou  
incluses par référence dans la présente et aux annexes  
ci-jointes, les biens et services énumérés ici et sur  
toute feuille ci-annexée, au(x) prix indique(s).

**Solicitation Closes /  
L'invitation prend fin:**

At / à : 14:00 EST

On / le : December 22nd 2022

<b>Title / Titre:</b> Vibration Table Replacement/ REEMPLACEMENT DE LA TABLE VIBRANTE		<b>Solicitation No / No de l'invitation:</b> W8472-215850/A      AMD 003	
<b>Date of Solicitation / Date de l'invitation:</b> 2022-10-21			
<b>Address Enquiries to – Adresser toutes questions à:</b>  Dalton Sicard 101 Colonel by Drive Ottawa ON D Mar P 2 K1A 0K2  dalton.sicard@forces.gc.ca			
<b>Telephone No. / N° de téléphone:</b>		<b>FAX No / No de fax:</b> N/A	
<b>Destination:</b> 9401 Wanklyn St., Lasalle QC H8R 1Z2 Canada			

**Instructions:**

Municipal taxes are not applicable. Unless otherwise specified herein all prices quoted must include all applicable Canadian customs duties, GST/HST, excise taxes and are to be delivered Delivery Duty Paid including all delivery charges to destination(s) as indicated. The amount of the Goods and Services Tax/Harmonized Sales Tax is to be shown as a separate item.

**Instructions:**

Les taxes municipales ne s'appliquent pas. Sauf indication contraire, les prix indiqués doivent comprendre les droits de douane canadiens, la TPS/TVH et la taxe d'accise. Les biens doivent être livrés «rendu droits acquittés», tous frais de livraison compris, à la ou aux destinations indiquées. Le montant de la taxe sur les produits et services/taxe de vente

<b>Delivery required / Livraison exigée:</b>	<b>Delivery offered / Livraison proposée:</b>
<b>Vendor Name and Address / Raison sociale et adresse du fournisseur:</b>	
<b>Name and title of person authorized to sign on behalf of vendor (type or print) / Nom et titre de la personne autorisée à signer au nom du fournisseur (caractère d'imprimerie):</b>	
<b>Name / Nom:</b> _____	<b>Title / Titre:</b> _____
<b>Signature:</b> _____	<b>Date:</b> _____

## **Request for Proposal (RFP) W8472-215850/A - Vibration Table Replacement**

Solicitation amendment 003 is raised to answer bidder's questions and update the SOW and Bid evaluation.

See SOW updated paragraphs 10.2.5.1.1, 10.2.5.2.1, and 10.2.5.8.

See Evaluation Matrix Table 3 for the entries that correspond to the paragraphs 10.2.5.1.1, 10.2.5.2.1, and 10.2.5.8.

### **In RFP:**

#### **DELETE:**

ANNEX A "Statement of Work"

and

ANNEX F "Mandatory Evaluation Criteria"

#### **INSERT (attached below):**

ANNEX A "Statement of Work"

and

ANNEX F "Mandatory Evaluation Criteria"

### Questions:

1. Does the floor have reaction mass in the concrete?

The floor itself doesn't. Seismic mass will be built prior to installation of the shaker once the winning bid will be determined.

2. Are we reusing the current amplifier?

No.

3. Are the trenches drained or cable?

Drain and service water supply piping.

4. Explain the power sources for the Shaker.

NETE facility receives 575V 3P Delta power from the city.

5. Is it 440 or 480 for Delta?

NETE facility receives 575V 3P Delta power from the city.

6. Where is the cooling tower and what are the specs?

The cooling tower is located on the roof and can supply approximately 500 gallons per minute depending on what other equipment is being used at the same time.

7. How did you want to layout the shaker?

Shaker layout must fit into the 7 meters by 10 meters (including the working area around the apparatus).

8. What are the amplifier specs? What is the model number and how old is it?

All of the requirements for the Shaker are driven by the SOW requirements. Old amplifier will not be re-used.

9. What is the overhead crane capacity?

15 Tons

10. Do you have vertical moment restriction?

The current Shaker has the vertical moment restriction of  $\pm 1$  inch (2 inches peak-to-peak). The Contractor must propose a solution for the Shaker that is compliant with the SOW paragraph 10.2.2.2.

11. Do you want an embedded pit?

Yes. See SOW 10.3.2

12. For the seismic mass do we want airbag or self leveling?

Request to provide a recommendation for the seismic mass that works with the recommended shaker (if required).

13. Is the old shaker supported?

Yes

14. Do we want all components CSA certified before delivery?

Yes, or an equivalent.

15. Is the 12 month delivery window set in stone?

No. A reasonable extension can be granted.

16. Do we want this within 12 months?

Yes.

17. What if seismic is not done before delivery?

Please provide a lead delivery time on the shaker system so it can be aligned with the creation of the seismic mass.

18. Is every article 10,000lbs, or is that the limit?

This is the limit per payload axis.

19. Do we normally need high G shock levels at 10,000lbs?

Please refer to the SOW requirements as per chapter 10.

20. What is the KVA of the amp?

Currently using 300 kVA.

21. What is the footprint in square meters for the shaker?

7 meters by 10 meters, including the working area around the apparatus.

22. Do you have temp controlled storage for the spares?

We do have a temperature controlled storage for spare parts, however, this would depend on the quantities and sizes of the spares. We also have non-temperature controlled storage for parts that do not need it.

23. Question about preventative maintenance in the SOW:

See SOW CDRL-TRG-01, CDRL-MNT-01, DID-TRG-01, and DID-MNT-01.

24. What is the total footprint size available to place the shaker, reaction mass, and skirt of 1.5m around the edge?

7 meters by 10 meters (including the working area around the apparatus).

25. Sine force expected is 42,000 lbf, is random force also expected to be 42,000 lbf? Random force is not called out in the tender.

Yes, both the random and sine force expected should be 42,000 lbf.

26. What temperature is the cooling water held and what flow is available to the shaker system?

At least 500 usgpm at 20°C

27. Would you like a separate line item in the quote for engineering hours devoted to the design assistance of the reaction mass?

Yes, but it will not be a part of the evaluation process under this bid.

28. Can the ground survey be shared after bid completion to assist with engineering design of the reaction mass?

Yes, the report can be shared with the winning bidder for the assistance with the seismic mass design.

29. Do you require the same overturning moment used on the current shaker, or does that need to increase proportional to the shaker power increasing?

Please propose a system compliant with the SOW requirements.

30. Will we need to include the cost of millwrights for shaker movement into final location?

Yes

31. NETE wanted to explore having the shaker 'sunk in' so the slip table is more on the level.

Seismic mass (if not included together with the shaker) should be positioned in the embedded pit. The shaker itself can remain on the floor level.

The desire is to have the shaker as low as possible while still being able to conduct regular maintenance and operation from the ground level. See SOW 10.2.1.3.

32. NETE also wanted the amplifiers underneath in the RM pit.

The amplifiers can be placed outside of the embedded pit but they must reside besides the area where the operators are sitting. Everything needs to fit into the identified footprint (7 meters by 10 meters (including the working area around the apparatus)).

33. Do you have a survey of the ground?

Yes.

34. Is the Bid in CAD?

Please see 4.1.2 Financial Evaluation. Bids not in CAD can be converted for the evaluation.

35. Is the bid in Hard Copy:

Solicitation No. - N° de l'invitation  
W8472-215850/A  
Client Ref. No. - N° de réf. du client  
W8472-215850/A

Amd. No. - N° de la modif.  
003  
File No. - N° du dossier  
W8472-215850

Buyer ID - Id de l'acheteur  
Q08  
CCC No./N° CCC - FMS No./N° VME

Please see PART 3 - BID PREPARATION INSTRUCTIONS

Question 1: As per clause 6.2 of the subject solicitation it seems this purchase is subject to Controlled Goods. Could you please advise if it is possible to remove Controlled Goods Requirements from this solicitation?

Answer 1:

The controlled goods clause only applies if the bidder chooses to supply controlled goods



**STATEMENT OF WORK  
FOR PROCUREMENT OF  
ELECTRODYNAMIC SHAKER SYSTEM**



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Appendix 2: List of CDRLs

Appendix 3: List of DIDs



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**LIST OF ACRONYMS AND ABBREVIATIONS**

<b>Acronyms or Abbreviations</b>	<b>Definition</b>
CA	Contract Award (in CDRL and DIDs)
CDR	Critical Design Review (meeting)
CDRL	Contract Deliverable Requirement List
CFTO	Canadian Forces Technical Order
CG	Centre of Gravity
CISD	Canadian Industrial Security Directorate
COTS	Commercial Off The Shelf
CSP	Contract Security Program
CTP	Cadre Training Package
dB	Decibels
dBA	A-weighted Decibels
DID	Data Item Description
DND	Department of National Defence
D Mar P	Director of Maritime Procurement
DOS	Designated Organization Screening
EMI	Electromagnetic Interference
FPM	Final Project Meeting
G	Acceleration of Gravity (9.82 m/s <sup>2</sup> )
GOC	Government of Canada
GOCO	Government-Owned-Contractor-Operated
Hz	Hertz
IAW	In Accordance With
in/s	inches per second
ISO	International Organization for Standardization
ITAR	International Traffic in Arms Regulations
ITP	Inspection and Test Plan
km	kilometre
kN	kilo Newton
kVA	Kilo-Volt-Ampere
lbf	pound-force
l/min	liter per minute
m	metre
mil	Thousandth of an inch
mm	millimetre
mT	millitesla
m <sup>2</sup>	square metres
m/s	meters per second
NDQAR	National Defence Quality Assurance Representative
NETE	Naval Engineering Test Establishment
OEM	Original Equipment Manufacturer
PDF	Portable Document Format
PM	Project Manager



PMP	Project Management Plan
PRM	Project Review Meeting
PSPC	Public Services and Procurement Canada
PSR	Project Status Reports
PWGSC	Public Works and Government Services Canada
QA	Quality Assurance
RCN	Royal Canadian Navy
RFI	Radio Frequency Interference
RFP	Request for Proposal
RSPL	Recommended Spare Parts List
SDS	Safety Data Sheet
SOW	Statement Of Work
SPT	Special Purpose Tools
TA	Technical Authority
TDP	Technical Data Package
THD	Total Harmonic Distortion
tonne(s)	Metric Tonne(s)
TSOR	Technical Statement of Requirements
UNC	Unified National Coarse (applicable to threads)
USA	United States of America
USML	Unites States Munitions List
V	Volt
VCR	Visit Clearance Request
WHMIS	Workplace Hazardous Material Information System
WME	Weir Marine Engineering

Table 1: Acronyms and Abbreviations



## 1 SCOPE

### 1.1 PURPOSE

- 1.1.1 The Purpose of this Statement of Work (SOW) is to describe the work associated with delivering an electrodynamic Shaker system (hereafter called a “Shaker”) at Naval Engineering Test Establishment (NETE), LaSalle QC, in replacement of the existing obsolete system.
- 1.1.2 This document also contains the Technical Statement of Requirements (TSOR) describing the minimum requirements for the Shaker.

### 1.2 BACKGROUND

- 1.2.1 The NETE is a Government-Owned-Contractor-Operated (GOCO) facility, headquartered at the Montreal borough of LaSalle, QC with detachments in Halifax, NS and Esquimalt, BC. As the Royal Canadian Navy (RCN)’s principal Test and Evaluation center, NETE supports the RCN from coast to coast. A Division of Weir Canada Inc., Weir Marine Engineering (WME) operates the NETE on behalf of the Government of Canada since 1953.
- 1.2.2 The original electrodynamic Shaker system (MB Dynamics C150) was installed at NETE LaSalle facility in early 1960s. Since that time, it was a major workhorse with extremely frequent intervals of use. The Shaker underwent a series of major upgrades in 2003, where its controller was replaced with a newer model and the drum exciter had an additional circulation hoses installed to improve cooling circulation. The current improvements allowed the equipment to continue operation, however, the Original Equipment Manufacturer (OEM) no longer supports this model.
- 1.2.3 To meet the constant and future demand from Department of National Defence (DND) and Industry clients, it is essential to maintain the vibration testing capability. Therefore, it is imperative to acquire a modern electrodynamic Shaker system that will continue to serve the RCN for years to come.

### 1.3 OBJECTIVES

- 1.3.1 The primary operational uses of the Shaker includes vibration excitation in both vertical and horizontal planes.
- 1.3.2 The fundamental objectives of the Shaker procurement are to:
  - 1.3.2.1 Acquire an electrodynamic Shaker system with a robust and a proven design from a single manufacturer together with its associated components and ancillary equipment required for proper operation;
  - 1.3.2.2 Acquire a spare parts list;
  - 1.3.2.3 Acquire a Technical Data Package (TDP) to be used by NETE to support maintenance and Shaker operations through its intended life cycle; and,



---

1.3.2.4 Acquire necessary training and training materials IAW SOW Sections 5.4, 5.5, 5.6, and 5.7.



## 2 APPLICABLE DOCUMENTS

### 2.1 DND AND GOVERNMENT DOCUMENTS

2.1.1 Where standards are referenced in this document, the whole standard may not apply unless specifically directed. The reference will indicate what tailoring is required by the Technical Authority. If no tailoring is specified, then the Contractor must specify the extent of their compliance to the referenced standard in their proposal.

2.1.2 Applicable documents are as follows:

- 2.1.2.1 *R.S.C., 1985, c. D-1*: Canada Defence Production Act, 17 December 2020.
- 2.1.2.2 *D-03-003-019/SG-001*: Canadian Forces Technical Order (CFTO), Department of National Defence, Standard for Vibration Resistant Equipment, 9 April 1970.
- 2.1.2.3 *SOR/86-304*: Canada Occupational Health and Safety Regulations, 25 June 2018.
- 2.1.2.4 *NRCC 56190*: Canada Occupational Health and Safety Regulations, 2015.
- 2.1.2.5 *NFC*: National Fire Code of Canada 2015, 2015.
- 2.1.2.6 *CSA-C22.1-18*: Canadian Standards Association, Canadian Electrical Code Part I - Safety Standard for Electrical Installations, 2018.
- 2.1.2.7 *CSA-C22.2 No. 0-10*: Canadian Standards Association, Canadian Electrical Code Part II - General requirements, 2015.
- 2.1.2.8 *CSA-C22.2 No. 0.4-17*: Canadian Standards Association, Canadian Electrical Code Part II - Bonding of Electrical Equipment, 2017.
- 2.1.2.9 *SSC C-27*: Labour Code, Minister of Labour, Quebec Government, 1 September 2020.
- 2.1.2.10 *L.R.Q., c. S-2.1*: Act Respecting Occupational Health and Safety, Minister of Labour, Quebec Government, 20 October 2020.
- 2.1.2.11 *R.S.Q., c. A-3.001*: Act Respecting Industrial Accidents and Occupational Diseases, Minister of Labour, Quebec Government, 20 October 2020.
- 2.1.2.12 *R.S.Q., c. S 2.1, r.4*: Safety Code for the Construction Industry, Minister of Labour, Quebec Government, 1 September 2020.
- 2.1.2.13 *R.S.C., 1985, c. L-2*: Canada Labour Code Part II Occupational Safety and Health, Minister of Justice, Government of Canada, 15 February 2021.
- 2.1.2.14 *CFFM 4003*: Canadian Forces Fire Marshal Directive, December 2014.
- 2.1.2.15 *TBD*: NETE Shop Floor Plan.

### 2.2 NON-GOVERNMENT OF CANADA DOCUMENTS

2.2.1 Where standards are referenced in this document, the whole standard may not apply unless specifically directed. The reference will indicate what tailoring is required by the Technical Authority. If no tailoring is specified, then the Contractor must specify the extent of his compliance to the referenced standard in his proposal. If any referenced standard or regulation in section 2.2.2 below has been superseded by a new revision or it has become obsolete and it has been replaced by a new standard or it has not been replaced, then the Contractor must use the latest revision or replaced standard or an equivalent standard respectively.



2.2.2 Applicable documents are as follows:

- 2.2.2.1 *MIL-STD-167-1A*: USA Department of Defense, Test Method Standard, Mechanical Vibrations of Shipboard Equipment, 1 May 1974.
- 2.2.2.2 *MIL-STD-810H*: USA Department of Defense, Test Method Standard, Environmental Engineering Considerations and Laboratory Tests, 31 January 2019.
- 2.2.2.3 *Code of Federal Regulations Title 22 Part 121*: United States Munitions List.
- 2.2.2.4 *DataPhysics*: SignalStar Vibration Controller User Manual, Revision 14.

2.3 ORDER OF PRECEDENCE

- 2.3.1 In the event of a conflict between the Standard for Vibration Resistant Equipment and requirements defined in this SOW, the requirements of this SOW, together with DND requirements and NETE custom applications, must take precedence.
- 2.3.2 In the event of a conflict between the contents of this document and the applicable portions of any other referenced technical documents, the Contractor must inform NETE (specifically the Technical Authority (TA)) of the differences. NETE will inform the Contractor of the requirements to apply and amend the SOW as necessary.





### 3 PROJECT DELIVERABLES

#### 3.1 GENERAL

##### 3.1.1 The Contractor must:

- 3.1.1.1 Supply and install one (1) Electrodynamic Shaker system with all its associated ancillary and auxiliary systems and documentation that meet the requirements of the Technical Statement of Requirements (TSOR) identified in this SOW Section 10.
  - 3.1.1.1.1 Shaker must originate from a single manufacturer, including all components and ancillary equipment described below and required for proper operation in both vertical and horizontal planes.
  - 3.1.1.1.2 The Shaker system must be compliant to the Canadian Electrical Code (CEC) from the Canadian Standards Association (CSA), see sections 2.1.2.6, 2.1.2.7, and 2.1.2.8.
  - 3.1.1.1.3 The Shaker and related documentation must not contain information which falls into the International Traffic in Arms Regulations (ITAR) as defined in the United States Munitions List (USML).
- 3.1.1.2 Provide NETE with all necessary instructions and guidance to coordinate, design and build the proper foundation for the installation of the new Shaker, if the foundation is an integral part of the Shaker design.
- 3.1.1.3 Carry out work required to design, deliver, install and commission the Shaker which meets the specifications of the TSOR.
- 3.1.1.4 The Contractor/Offeror must, at all times during the performance of the Contract/Standing Offer, hold a valid Designated Organization Screening (DOS), issued by the Contract Security Program (CSP), Public Works and Government Services Canada (PWGSC). The Contractor/Offeror personnel requiring access to sensitive site(s) must EACH hold a valid RELIABILITY STATUS, granted or approved by the CSP, PWGSC.
- 3.1.1.5 Be responsible for shipping and duty clearances up to the NETE facility.
- 3.1.1.6 Provide all technical details on Shaker including:
  - 3.1.1.6.1 Recommended installation layout and constraints (e.g. max distance between components);
  - 3.1.1.6.2 Individual component details and drawings including physical dimension and weight, connection points, mounting interface requirement, lifting points; and,
  - 3.1.1.6.3 Facility services requirements for installation (Electrical, Cooling Water, Compressed Air, etc.).
- 3.1.1.7 Provide the stamped engineering drawings for installation phases of the project.
- 3.1.1.8 Provide all Safety Data Sheets (SDS) for all parts, assemblies and components that contain Hazardous Materials (HAZMAT).
- 3.1.1.9 The Contractor must provide all required documentation in hardcopy and PDF format.
- 3.1.1.10 In addition, the Contractor must develop and deliver plans and procedures for:
  - 3.1.1.10.1 Maintenance;
  - 3.1.1.10.2 Acceptance;



- 3.1.1.10.3 Inspections;
- 3.1.1.10.4 Trials; and,
- 3.1.1.10.5 Safe Operation of the Shaker;
- 3.1.1.11 Contractor must deliver to NETE a maintenance TDP meeting all relevant requirements identified in this SOW.
- 3.1.1.12 Familiarization and maintenance training must be provided in accordance with the applicable Contract Deliverable Requirement Lists (CDRLs) and Data Item Descriptions (DIDs).

## 3.2 DATA REVIEWS AND REVISIONS

- 3.2.1 The Contractor must submit all deliverable data in draft form for NETE's review IAW the applicable CDRL.
- 3.2.2 The Contractor must ensure that submitted documents are complete and in compliance with the requirements of the SOW and the applicable CDRL and DID.
- 3.2.3 Unless otherwise noted, NETE's review will take no more than ten (10) business days from receipt of the data.
- 3.2.4 The provision of comments by NETE on draft deliverables must not be construed as approval of the data deliverable.
- 3.2.5 Unless otherwise noted, the Contractor must address NETE's comments and resubmit the document showing a new revision number, within five (5) business days of reaching agreement on the comments.
- 3.2.6 The Contractor must ensure that final documents consist of the draft document modified to include changes as authorized by NETE.
- 3.2.7 When revisions and amendments have been made to data deliverables required under this SOW, the Contractor must submit the revisions/amendments to NETE.



## **4 PROJECT MANAGEMENT**

### **4.1 ORGANIZATION**

- 4.1.1 Project Manager: The Contractor must assign a Project Manager responsible to carry out the work required for the Shaker delivery program. The Contractor's Project Manager must have the authority to plan, direct, control and make decisions for the Contractor as these pertain to the execution of this Contract.
- 4.1.2 Contractor's Point of Contact: The Contractor's Project Manager must be the main single point of contact with NETE.

### **4.2 PROJECT MANAGEMENT PLAN**

- 4.2.1 The Contractor must prepare and deliver a Project Management Plan (PMP) IAW CDRL Item CDRL-PM-01 and DID-PM-01 to identify how the Contractor intends to fulfill the project management requirements of this SOW.
- 4.2.2 It is estimated that the delivery of the Shaker should be completed 12 months after Contract Award (CA) at the latest, followed by the installation and the set to work.
- 4.2.3 Once accepted by NETE, the PMP must be used by the Contractor to manage the activities of this Contract. Throughout the duration of the Contract, the Contractor must inform NETE of any changes that affect the execution of the PMP and submit a revised PMP for NETE's acceptance if requested.

### **4.3 ACCESS TO NETE LASALLE FACILITY**

- 4.3.1.1 When required, and with the agreement of NETE, the Contractor may be provided access to NETE LaSalle facility, on an as required, escorted and non-interference basis, to allow the Contractor to carry out the tests, trials, delivery, and training requirements of this SOW. Virtual presence (Microsoft Teams) falls under the same category as escorted visit.

### **4.4 PROJECT MEETING SUPPORT**

- 4.4.1 The Contractor must convene and co-chair project reviews and meetings as required by this SOW.
- 4.4.2 For all reviews and meetings the Contractor must:
  - 4.4.2.1 Arrange the venue, including parking, as appropriate, when a meeting is not taking place on NETE LaSalle premises;
  - 4.4.2.2 Coordinate with NETE as appropriate;
  - 4.4.2.3 Provide all administrative facilities and presentation equipment, when a meeting is not taking place on NETE LaSalle premises;
  - 4.4.2.4 Ensure that necessary and qualified Contractor and Subcontractor personnel attend the reviews or meetings;



- 4.4.2.5 Ensure and report that action items and decisions resulting from the various meetings and reviews are implemented where applicable;
- 4.4.2.6 Maintain, and provide to DND files, records, documents and records of all reviews and meetings; and,
- 4.4.2.7 NETE will provide the Contractor with the number of attendees representing NETE at each review and meeting not less than ten (10) business days before the respective review or meeting.

#### 4.5 PROJECT MEETING ARRANGEMENTS, LOCATION AND FACILITIES

- 4.5.1 Unless otherwise stated for individual meetings, the Contractor must arrange and prepare for meetings IAW the following requirements.
- 4.5.2 The Contractor must prepare and submit supporting documents required (in native editable format) for a meeting at least five (5) business days in advance of each scheduled review or meeting.
- 4.5.3 The Contractor must prepare and submit an agenda IAW CDRL Item CDRL-PM-02 and DID-PM-02 at least five (5) business days in advance of each scheduled review or meeting. NETE will provide any comments on the agenda within two (2) business days of receipt.
- 4.5.4 In the event of unscheduled meetings the Contractor must submit an agenda 24 hours prior to the meeting.
- 4.5.5 NETE and the Contractor must mutually agree to the contents of the agenda.
- 4.5.6 Meetings must generally be conducted either at the Contractors facilities or at a third party location, arranged for by the Contractor, within a 50 km radius of the Contractors facilities.
- 4.5.7 With the mutual consent of NETE and the Contractor, and given current pandemic situation, meetings may be conducted by teleconference, web-conference or videoconference.
- 4.5.8 The cost associated with all identified meetings must be included in the total price identified in the Contract. The Contractor must cover all costs associated with the location and equipment required to conduct the meetings or review except for travel costs associated with the attendance of representatives from NETE.

#### 4.6 PROJECT MEETING MINUTES

- 4.6.1 The Contractor must record, produce, deliver and revise, as required, minutes for all meetings.
- 4.6.2 The Contractor must prepare and distribute, within five (5) business days of the meeting, an electronic copy of the minutes to NETE's attendees IAW CDRL Item CDRL-PM-03 and DID-PM-03.



4.6.3 Meeting minutes are accepted once signed by the Contract Authority. NETE will advise the Contractor of any issues within two (2) business days of receiving the minutes at which point the Contractor will be responsible for revision and resubmittal within two (2) business days.

#### 4.7 PROJECT MEETING CANCELLATIONS

4.7.1 Requests to reschedule reviews or meetings will, in general, be made at least five (5) business days in advance of the meeting date to facilitate and travel arrangements changes.

#### 4.8 PROJECT KICK-OFF MEETING

4.8.1 Within ten (10) business days of Contract Award, the Contractor must convene and co-chair a project Kick Off Meeting, IAW CDRL item CDRL-PM-05 and DID-PM-05 at NETE LaSalle facility, via video or teleconference or elsewhere as agreed to between the Contractor and NETE.

4.8.2 The agenda must be delivered five (5) business days prior to the meeting for input from NETE and acceptance. The agenda of items to be reviewed at the meeting must include, without being limited to:

4.8.3 The PMP (in particular the Master Schedule) IAW CDRL Item CDRL-PM-01 and DID-PM-01:

4.8.3.1 Shaker technical requirements;

4.8.3.2 Non-construction deliverable requirements;

4.8.3.3 Critical path activities; and,

4.8.3.4 Any other contractual or programmatic issues associated with the project as mutually agreed between the NETE and the Contractor.

#### 4.9 PROJECT REVIEW MEETINGS

4.9.1 The Contractor must convene and co-chair Progress Review Meetings (PRMs) at least monthly or as mutually agreed between NETE and the Contractor.

4.9.2 The list of mandatory PRM attendees must always include Project Manager.

4.9.3 PRMs must encompass total project status as of the review date.

4.9.4 The kick-off meeting may be assumed to be the first PRM.

#### 4.10 PROGRESS REPORTS

4.10.1 The Contractor must monitor progress and deliver Project Status Reports (PSRs) IAW CDRL Item CDRL-PM-04 and DID-PM-04.



#### 4.11 CRITICAL DESIGN REVIEW MEETING

- 4.11.1 The Contractor must convene and co-chair a Critical Design Review (CDR) Meeting for the purpose of reviewing the design deliverables identified as Critical Design Documents IAW CDRL-EN-01 and DID-EN-01.
- 4.11.2 The list of mandatory CDR attendees must always include Project Manager.
- 4.11.3 The intent of the CDR Meetings is for the Contractor to demonstrate to NETE that the Shaker specifications, and ancillary and auxiliary systems installation documentation are complete and that the design is in compliance with the technical and contractual requirements of the SOW. If compliance is proven by the Contractor, then the acceptance of the critical design package by NETE will mark the beginning of the phase that prepares the NETE LaSalle facility for construction. Following acceptance, any further changes to the design or the technical documents must be tracked any affected documents or drawings updated and re-submitted to NETE by the Contractor.
- 4.11.4 The Contractor must identify the CDR Meeting in the Master Schedule.

#### 4.12 ACCEPTANCE REVIEW MEETING

- 4.12.1 The Contractor must convene and co-chair an Acceptance Review Meeting(s) for the purpose of reviewing the design deliverables identified in the Technical Data Package (TDP) in accordance with CDRL-EN-02 and DID-EN-02 for review of the results of inspections and tests required to verify compliance with the TSOR.
- 4.12.2 The list of mandatory Acceptance Review Meeting(s) attendees must always include Project Manager.
- 4.12.3 The intent of the Acceptance Review Meetings is for the Contractor to demonstrate to NETE that the site construction and all associated documentation have been completed and are in compliance with the technical and contractual requirements of the SOW. If compliance is proven by the Contractor then NETE will issue provisional acceptance of the Shaker. Following provisional acceptance, the Contractor may proceed with the delivery of the actual Shaker unit as specified.
- 4.12.4 The Contractor may perform an Acceptance Review Meeting and obtain provisional acceptance of each construction milestone (i.e. foundation, seismic mass installation, et cetera) following completion of construction. If there is more than one Acceptance Review Meeting, then the Contractor must ensure that all relevant documentation in the TDP is available for review prior to each meeting and any changes or updates between meetings are accurately addressed.
- 4.12.5 The Contractor must identify the Acceptance Review Meeting(s) in the Master Project schedule.
- 4.12.6 The final TDP will be accepted only after NETE is satisfied with the final TDP content that reflects the delivered Shaker and any errors, corrections or changes have been addressed.



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#### 4.13 ISSUE REPORTING

- 4.13.1 The Contractor must advise NETE by email within three (3) business days of the date the Contractor determines that there is an issue that will result in a schedule alteration or potential contractual change.
- 4.13.2 Upon such notification NETE will advise the Contractor whether an unscheduled meeting or other action is required.

#### 4.14 ACTION ITEM LIST

- 4.14.1 The Contractor must maintain a historical, chronological and up-to-date electronic Action Item List resulting from reviews, meetings, or correspondence between NETE and the Contractor, for the duration of the Contract. The format for the Action Item List must be acceptable to NETE. Microsoft Excel is an acceptable tool for maintaining and distributing the Action Items List.
- 4.14.2 In the Action Items List the Contractor must record, as a minimum: identification number; title and/or description, date opened, action required, priority, organization responsible for taking action, brief statement of results in sufficient detail to clearly identify and track the action taken, date closed, and, status (open/closed). The Contractor must ensure that, once entered, no entry is deleted.
- 4.14.3 The Contractor must include a subset of the up-to-date Action Items List containing all open items as an attachment to any meeting agendas.
- 4.14.4 The Contractor must make a copy or reproduction of the most current Action Items List or any portion thereof available to NETE upon request.

#### 4.15 HEALTH AND SAFETY

- 4.15.1 The Contractor must give the upmost importance to health and safety and the prevention of accidents. The Contractor must, at all times, conform to the DND and WME Health and Safety policies and be responsible for the health and safety of its employees and accident prevention.
- 4.15.2 The Contractor must be responsible for the health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by the work.
- 4.15.3 The Contractor must comply with all national and provincial health policies pertaining to the COVID-19 pandemic.
- 4.15.4 The Contractor must submit all applicable Workplace Hazardous Material Information System (WHMIS) Safety Data Sheets (SDS) to a NETE representative.
- 4.15.5 The Contractor must submit, prior to the start of work on site, the Health and Safety (H&S) Plan for review, comment and acceptance by NETE. This H&S plan, at minimum, must include:



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- 4.15.5.1 Result of site specific safety hazard assessment;
  - 4.15.5.2 Contractor's company Health and Safety Plan; and,
  - 4.15.5.3 Site specific Health and Safety Plan.
  - 4.15.6 The Contractor must submit copies of health and safety incident and accident reports to NETE representative within 24 hours of occurrence.
  - 4.15.7 The Contractor must be the Principal Contractor as defined in the Act Respecting Occupational Health and Safety of Quebec (section 2.1.2.10), and execute only the work within the scope and in the areas defined in this specification.
  - 4.15.8 The Contractor must possess all necessary insurances to carry out the specified work, such as, but not limited to: civil liability, errors and omissions and any other required insurances.
  - 4.15.9 The Contractor must comply with and enforce compliance by employees and sub-contractors with safety requirements of Contract Documents, all applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with the site-specific H&S Plan, as minimum:
    - 4.15.9.1 Act Respecting Occupational Health and Safety (section 2.1.2.10);
    - 4.15.9.2 Act Respecting Industrial Accidents and Occupational Diseases (section 2.1.2.11);
    - 4.15.9.3 Safety Code for the Construction Industry (section 2.1.2.12);
    - 4.15.9.4 Canada Labour Code Part II Occupational Safety and Health (section 2.1.2.13)
    - 4.15.9.5 Canada Occupational Health and Safety Regulations (section 2.1.2.3); and,
    - 4.15.9.6 DND Fire Safety Requirements (section 2.1.2.14).





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## 5 MAINTENANCE AND TRAINING

### 5.1 GENERAL

- 5.1.1 The maintenance and training plans must be provided by the Contractor to NETE to facilitate safe deployment of the Shaker.
- 5.1.2 Current shaker maintenance plan can be found in the Section 9 of this SOW for generic reference.

### 5.2 MAINTENANCE REQUIREMENTS

- 5.2.1 The Contractor must prepare and deliver, for acceptance by the TA, a recommended Maintenance Concept IAW CDRL item CDRL-MTN-01 and DID-MTN-01 and current industrial best practices.
- 5.2.2 The maintenance routine for the Shaker must assume nominal preventive maintenance cycles (i.e. monthly, yearly, bi-yearly, etc.). Maintenance activities must include, but not limited to:
  - 5.2.2.1 Amplifier verification;
  - 5.2.2.2 Visual inspection of the internals of the Shaker head;
  - 5.2.2.3 Inspection of slip table;
  - 5.2.2.4 Verification of resonance frequencies of the Shaker head and slip table;
  - 5.2.2.5 Inspection of heat exchanger, cooling pipes and other ancillary systems feeding into the Shaker; and,
  - 5.2.2.6 Inspection of air cushions below and above the seismic mass.
- 5.2.3 The maintenance concept must contain a maintenance manual detailing the required maintenance routines, the schedule of maintenance routines and instructions for the completion of each maintenance routine.
- 5.2.4 The maintenance manual must reference any construction standards that must be used to effect the required maintenance routines to the same quality as the original build.
- 5.2.5 Wherever possible for common industry components, the maintenance of the Shaker must use Repair by Replacement of defective components and sub-assemblies.

### 5.3 SPARES

- 5.3.1 The Contractor must provide a Recommended Spare Parts List (RPSL). The RSPL must contain the Contractor's recommendation for spares required to maintain the equipment for a 24-month period.



#### 5.4 FAMILIARIZATION AND MAINTENANCE TRAINING

5.4.1 The Contractor must develop and deliver familiarization and maintenance training IAW this Section and CDRL item CDRL-TRG-01 and DID-TRG-01 and the current industrial best practice.

#### 5.5 NUMBER TRAINING SESSIONS AND STUDENTS

5.5.1 The maintenance portion of the training must be based on the Maintenance Concept and Maintenance Manual developed by the Contractor.

5.5.2 The Contractor must prepare and produce a Training Plan and Maintenance and Familiarization Training Package. The Contractor must develop and conduct one (1) maintenance and familiarization training session on the Shaker before SATs.

5.5.3 The Contractor is to assume that the training session will be for ten (10) personnel from NETE.

#### 5.6 TRAINING MATERIAL AND CONTENT

5.6.1 The training material and content must be reviewed and accepted by NETE.

5.6.2 The Contractor must provide the Shaker operator and maintainer training package, in MS Office format and PDF formats.

5.6.3 The Contractor must provide unrestricted rights for NETE to use and have use of all intellectual property associated with the training and maintenance package material provided.

#### 5.7 LANGUAGE

5.7.1 All Contractor supplied training and the training material must be provided in both official languages in Canada (English and French).

5.7.2 If provision of French version, or vice versa, is not possible, the Contractor must provide the unrestricted rights for NETE to translate all material into French, or vice versa.

#### 5.8 TECHNICAL DATA PACKAGE

5.8.1 The Contractor must provide the technical data package for the Shaker IAW CDRL-EN-02 and DID-EN-02.

#### 5.9 ELECTRONIC LABELLING

5.9.1 All electronic media must be clearly labelled with the project number, project name, and date as prescribed by D Mar P and agreed upon with NETE.



5.9.2 If a complete listing of all files contained on a piece of electronic media exceeds the label size for that media, a “readme.txt” file in ASCII format must be provided. The “readme.txt” file must be store on the electronic media and a complete printout of the file provided. The “readme.txt” file must contain a complete listing of all filenames, drawing numbers, and other relevant data for all electronic files contained on the electronic media.

5.9.3 A printed copy of the Readme file must accompany each piece of electronic media.

#### 5.10 ENGINEERING DATA ACCESS

5.10.1 In addition to any other specific documentation or engineering data identified as a deliverable in this SOW, the Contractor must provide NETE access to all engineering data during the period of the Contract, upon request.

#### 5.11 ORIGINAL EQUIPMENT MANUFACTURER (OEM)

5.11.1 If applicable, the Contractor must make maximum use of existing OEM technical publications and provide OEM parts identification data.

5.11.2 For any such material the Contractor must obtain permission from the OEM to allow NETE to use the data and to have any unilingual data translate into the official languages of Canada.

#### 5.12 ANNUAL SAFETY CHECKS AND SUPPORT

5.12.1 The Contractor must be available to conduct annual safety checks on the Shaker for at least a 24-month period.

5.12.2 The safety checks must include the nominal verifications and trials that confirm the proper operation of the Shaker and supporting systems.

5.12.3 The Contractor must be available to provide troubleshooting and support to NETE personnel in case of a catastrophic failure of any main, auxiliary and ancillary machinery necessary for the adequate Shaker operation for at least a 24-month period

5.12.4 The work must be conducted by the OEM or an authorized local representative.



## 6 ACCEPTANCE TESTING AND COMMISSIONING

### 6.1 GENERAL

- 6.1.1 The Contractor must produce and deliver an Inspection and Test Plan (ITP) that provides an overall outline of the entire spectrum of inspection, test and trial activities associated with the Shaker acceptance.
- 6.1.2 The ITP must contain all conditions, precautions, adjustments, expected test results, tolerances, and test equipment required to verify the proper design, fabrication, and verification of the Shaker. All inspections, test and trials must be witnessed and accepted by NETE, the Contractor and any required third party inspectors (i.e. members of DND).
- 6.1.3 The Contractor must produce an ITP that includes, but is not limited to the criteria in Section 10 of the SOW.
- 6.1.4 The ITP must be developed, reported on and delivered IAW CDRL item CDRL-AP-01 and DID-AP-01, and approved by the Project Manager.

### 6.2 POST-INSTALLATION INSPECTION AND SITE ACCEPTANCE TRIALS (SATs)

- 6.2.1 The purpose of the acceptance testing is to demonstrate that the performance and functional requirements of the Shaker at each integration step have been satisfactorily met.
- 6.2.2 The Contractor must perform an inspection of the installed system prior to initial power up.
- 6.2.3 The Contractor must perform all tests and trials necessary to demonstrate the Shaker meets all requirements identified in this SOW.
- 6.2.4 The Contractor must, with support from NETE, perform SATs for an expected minimum duration of one (1) week.
- 6.2.5 The Contractor must, with support from NETE, support the conduct of typical tests for an expected minimum duration of one (1) week to verify:
  - 6.2.5.1 D-03-003-019/SG-001 Sine Test (Horizontal & Vertical) with typical load;
  - 6.2.5.2 MIL-STD-167-1A Sine Test (Horizontal & Vertical) with typical load;
  - 6.2.5.3 MIL-STD-810H Method 514.8: Random Vibration, 5 to 50 Hz @ 0.0010 g<sup>2</sup>/Hz
  - 6.2.5.4 MIL-STD-810H Method 514.8: Sine on Random Vibration;
  - 6.2.5.5 MIL-STD-810H Method 514.8: Random (1 g<sup>2</sup>/Hz) on Random (0.030 g<sup>2</sup>/Hz) Vibration
  - 6.2.5.6 MIL-STD-810H Method 516.8 Procedure 1: Sawtooth Shock Test at 20g; and,
  - 6.2.5.7 MIL-STD-810H Method 516.8 Procedure 3: Trapezoidal Shock Test at 30g.
- 6.2.6 The Contractor must, with support from NETE, perform initial commissioning including a written statement report on:



- 6.2.6.1 Verification of all safety interlocks and limits;
- 6.2.6.2 Configuration of controller parameters for Shaker limits and scaling factors; and,
- 6.2.6.3 Define normal operating parameters.
- 6.2.7 Upon successful completion of the SATs, the Contractor must present NETE with a written statement report on:
  - 6.2.7.1 Validation that all TSOR parameters are met;
  - 6.2.7.2 Shaker Frequency Response (bare);
  - 6.2.7.3 Head Expander Frequency Response (bare); and,
  - 6.2.7.4 Slip Table Frequency Response (bare).

### 6.3 REPAIR AND RE-TESTING

- 6.3.1 If any of Shaker components or the system as whole fail any inspection or trial, the Contractor must rectify the issue, including any underlying causes, and re-test the repaired Shaker.
- 6.3.2 If it is determined that the test failure was the result of a design or construction issue, the Contractor must repair/rectify the defect. All associated technical documentation must be updated to reflect the repaired solution, if applicable.

### 6.4 PROVISIONAL ACCEPTANCE

- 6.4.1 Following the successful completion of all inspections, trial of the Shaker, and the delivery of the associated TDP, the Contractor must hold an Acceptance Review Meeting to review the deliverable package as a whole with NETE as per SOW Section 4.12.
- 6.4.2 Upon agreement by NETE that all associated deliverables and other Contractual obligations for the Shaker have been received / completed, all defects have been satisfactorily remedied and the Shaker has met all requirements in this SOW, NETE will issue a provisional acceptance for the Shaker.

### 6.5 ACCEPTANCE

- 6.5.1 Once the provisionally accepted Shaker has successfully perform a set of vibration tests for an arbitrary DND equipment, NETE will formally accept the Shaker system.



## **7 QUALITY ASSURANCE (QA)**

### **7.1 GENERAL**

- 7.1.1 The Contractor must implement and maintain a Quality Management System in accordance with the Contract Quality Assurance clauses.
- 7.1.2 The Contractor must make available to the National Defence Quality Assurance Representative (NDQAR) the Quality Assurance audits and inspection records upon request.
- 7.1.3 Canada reserves the right to conduct system verification to confirm product compliance with any or all of the performance requirements defined within the Appendix 1: Electrodynamic Shaker Technical Statement of Requirements to this SOW and all other referenced specifications.
- 7.1.4 NETE reserves the right to conduct QA inspections and audits to verify the Contractor's quality assurance procedures, practices, and methods during production and all other work associated with the Contract.



## 8 CONTRACT DELIVERABLE REQUIREMENTS LIST (CDRL) AND DATA ITEM DESCRIPTION (DID)

### 8.1 GENERAL

#### 8.1.1 Document Changes/Updates

8.1.1.1 All the approved documents must be prepared, updated and delivered as required by the CDRL. All changes to updated versions of documents must be identified as follows:

8.1.1.2 On a change page indicating page numbers, paragraph numbers, date of change and reason for change:

8.1.1.2.1 Within the hard copy, by use of change bars in the side margins of the printed document; and,

8.1.1.2.2 Within the soft copy, using a method appropriate to the authoring tools that clearly differentiates old content from new or revised content.

8.1.1.3 Proposed amendments and the list of effective pages must be forwarded to NETE for acceptance as described in the CDRL.

#### 8.1.2 Deliverable Format and Number of Copies:

8.1.2.1 The number of documentation copies required for each CDRL is defined within each CDRL.

8.1.2.2 All soft copies of documentation must be delivered in the original editable native source file format, (e.g. Microsoft Word, Excel, AutoCAD, SolidWorks, etc.) and in portable document format (PDF).

8.1.2.3 In the following CDRL tables '1 soft copy' means one (1) complete electronic copy comprised of the combination of the native format file and the pdf format file.

### 8.2 CDRL AND DID SUMMARIES

8.2.1 The CDRLs and summaries use the following abbreviations:

8.2.1.1 A: Acceptance

8.2.1.2 R: Review

8.2.1.3 CA: Contract Award

8.2.1.4 bd: Business day

8.2.1.5 PRM: Progress Review Meeting

8.2.1.6 PA: Provisional Approval (Acceptance Meeting) for Shaker

8.2.1.7 CDR: Critical Design Review Meeting

#### 8.2.2 Project Management Summary

CDRL	DID	Deliverable	Review Level	Due	SOW Section
CDRL-PM-01	DID-PM-01	Project Management Plan	A	CA +10bd	4.2 4.15.4



CDRL	DID	Deliverable	Review Level	Due	SOW Section
					4.15.5
CDRL-PM-02	DID-PM-02	Meeting Agendas and Supporting Documents	A	Meeting Date -5bd	4.5
CDRL-PM-03	DID-PM-03	Meeting Minutes	A	Meeting Date +5bd	4.6
CDRL-PM-04	DID-PM-04	Project Status Reports	R	CA +30bd, every 3 <sup>rd</sup> PRM -5bd thereafter	4.10
CDRL-PM-05	DID-PM-05	Project Kick Off Meetings	R	CA +10bd	4.8

Table 2: Project Management Summary

### 8.2.3 Engineering Summary

CDRL	DID	Deliverable	Review Level	Due	SOW Section
CDRL-EN-01	DID-EN-01	Critical Design Documents	A	No later than CA +60bd and not less than CDR -10bd	4.11
CDRL-EN-02	DID-EN-02	Technical Data Package	A	PA -20bd	4.12

Table 3: Engineering Summary

### 8.2.4 Acceptance Testing Summary

CDRL	DID	Deliverable	Review Level	Due	SOW Section
CDRL-AP-01	DID-AP-01	Shaker Acceptance Plan and Procedures	R	CA +60bd	6

Table 4: Acceptance Testing Summary

### 8.2.5 Training and Maintenance Support Summary

CDRL	DID	Deliverable	Review Level	Due	SOW Section
CDRL-TRG-01	DID-TRG-01	Cadre Training Package	A	PA -20bd	5.4 5.5 5.6 5.7 5.8
CDRL-MTN-01	DID-MTN-01	Maintenance Concept	A	PA -20bd	5.2

Table 5: Training and Maintenance Support Summary





## 9 CURRENT SHAKER MAINTENANCE PLAN

### 9.1 GENERAL

9.1.1 The current Shaker maintenance plan is presented in the Table 6 below. The Contractor could use the presented plan to develop required Maintenance Concept IAW CDRL item CDRL-MTN-01 and DID-MTN-01 and current industrial best practices.

System	Sub-System	Components	Frequency, month(s)	Maintenance requirement
<b>Shaker Amplifier Cabinet</b>	Amplifier	Amplifiers	12m	Calibrate the amplifier.
		Fan Filter	1m	1) Lockout shaker as per procedure HSI001.
			1m	2) Gently remove all filters and store in a small box or bin to relocate.
			1m	3) Do not clean filters on the shaker near the unprotected cabinet. Use compressed air to blow through all screens and filters. Use caution: wear gloves.
			1m	4) Install all filters on the cabinets.
			1m	5) Remove lockout.
			1m	6) Sweep or mop area where filters were cleaned.
		Switch	12m	Inspect switches for sign of overheating or defect, replace as required.
Cables	12m	Review the condition of all attached cables routed between the shaker and power amplifier. Inspect cable insulation breach, repair or replacement if applicable.		



System	Sub-System	Components	Frequency, month(s)	Maintenance requirement
		Fans	12m	Inspect fans for sign of overheating or defect, replace as required.
		Relays	12m	Inspect relays for sign of overheating or defect, replace as required.
<b>Vibration</b>	C-150 Exciter Head (Shaker)	Dome (Upper Segment)	1m	1) Rotate the exciter head 90 degrees, torque should be less than 30 ft-lb during the rotation. Check hoses and cables to prevent kinking during rotation and confirm smooth rotation is obtained.
			1m	2) Rotate the exciter back to vertical position.
			Before each test	Visual inspection for cracks or any damage on the rubber boot.
		Linear Bearing	Depends on the performance test	If an issue with the alignment is found, the surfaces of the journal bearings should be inspected. Any bearing that exhibits damaged surface or excessive roughness needs to be replaced.
		Field Coils	Depends on the performance test	Measure current and voltage, compare with OEM specifications.
		Trunnion	1m	Grease the system and rotate the gear to 90 degrees clockwise, use the general purpose grease.
		Cooling Lines	1m	Check for oil leaks when system is running.
		Measurements	24m	Conduct a performance test IAW OEM specs.
		Bolts	6m	Perform a visual inspection on all retaining bolts on the shaker for cracks or insert integrity in particular those located in the base, replace as required.



System	Sub-System	Components	Frequency, month(s)	Maintenance requirement
		Electrical Wires	6m	Inspect wires for sign of overheating or any damages, replace as required.
		Cement Block Base	24m	Check the surface for cracks, blisters or other damage, inform the engineer if damages are found.
<b>Cooling system</b>	Unit: PHM-11 (Oil-Water)	Heat Exchanger	1m	Visual inspection for leaks or damage.
			12m	Clean/overhaul oil heat exchanger if required.
		Main Pump	12m	Visual inspection for damages and test functionality, replace as required.
		Water Flow Regulator	Before each test	Ensure that the valve, located beside to the MTS machine, should be closed during the test and then opened at the end of the test.
		Reservoir Tank	12m	Clean oil strainer located inside the tank (to remove strainer undo the four bolts located on the oil pump suction line cover).
			Before each test	Check oil level in sight glass. Use SHELL DIALA Oil AX to fill up.
		Oil (Use Only The SHELL DIALA AX Oil)	12m	Collect a sample for lab analysis. If the laboratory test indicates water content more than 1%, the oil should be replaced and cleaned the strainer tank.
		Scavenger Pump	12m	Visual inspection for damages and test functionality, any functional damage shall be reported to QPTG.
Hoses And Pipes	1m	Start system and check for leaks. Coordinate with FTS instrumentation laboratory personnel to operate the system. (Unit PHM-11 and Unit PHS-4).		



System	Sub-System	Components	Frequency, month(s)	Maintenance requirement
		'Y" Strainer	12m	Clean the strainer and run the system to check for leaks.
		Bypass Valve	12m	Inspect the bypass valve for leaks or damages, repair as required.
		Fittings	6m	Inspect all fittings for leaks or damages, replace as required.
	Unit: PHS-4 (Water-Water)	Heat Exchanger	1m	Visual inspection for leaks or damage.
		Main Pump	12m	Visual inspection for damages and test functionality, any functional damage shall be reported to QPTG.
		Solenoid Valve	12m	Remove, inspect and clean or replace if defective.
		'Y" Strainer	1m	Remove and clean "y" strainer of cooling water inlet located underneath platform near the cooling package.
		Drain	3m	Visual inspection for leaks, clean the drain.
	Distilled Water	Cartridge (Filter Deionizer)	12m	Change the demineralizing filter located underneath the platform on the cooling package (Barnstead cartridge No.D0803)
		Canister	3m	Examine the inside for any residual deposits. If any residual are observed, clean the system.
		Make-Up Tank	1m	1) Check water level to be 1/2 to 3/4 full, use distilled water to fill up. The tank is located on the backside of the medium weight shock test cell. 2) Adjust the pressure at the distilled water make-up tank to 15 psig.



System	Sub-System	Components	Frequency, month(s)	Maintenance requirement
		Water Quality	6m	Test water for resistivity, organic content and inorganic content. A minimum resistivity of 1000 ohm-inches is required. If result are not satisfactory, then flush the water and fill it with new distilled water.
	Sensors And Switches	Temperature Switch	12m	Test functionality and set points, replace if defective.
	Electrical Controller	Starter Relay	12m	Inspect relays for sign of overheating or defect, replace as required.
	Water Supply	Service Water	6m	Inspect all pipes for leaks, replace as required.
		City Water	6m	
<b>Hydraulic</b>	Hydraulic Power Pack	Filters	12m	1) Replace the oil strainer filter.
			12m	2) Replace the 25 micron return filter
			12m	3) Replace the 10 micron pressure filter
		Hydraulic Oil (Use Only The Mobil DTE 26)	1m	Check oil level in sight glass. Use Mobil DTE 26 to fill up.
			6m	Take oil sample, conduct visual color comparison, provide sample to chemistry lab to conduct a viscosity test at 100°C and 40°C, particle counter (ISO 4406), copper strip corrosion (ASTM D130), water content, wear metal, density and flash point. If results are not satisfactory, replace the oil.
			12m	Replace oil, use only the Mobil DTE 26.



System	Sub-System	Components	Frequency, month(s)	Maintenance requirement
		Hoses And Pipes	1m	1) Start hydraulic power supply and slowly set pressure to 2500-3000 psi.
			1m	2) Let the system run for five (5) minutes and verify that there are no leaks in the hoses and pipes.
			1m	3) Verify that the slip table can move freely.
			1m	4) Lower pressure setting to 0 psi, and wait 3 minutes to let the pump scavenge excess oil from bearings.
			1m	5) Stop the hydraulic power supply and wipe it down.
		Relief Valve	1m	Check pressure relief valve to be fully open (back-off all the way to 0 psi).
	Oil Cooler	12m	Clean oil cooler fins using compressed air.	
	Slip Table	Granite Inspection	Depending on the performance test	Inspect the granite table surface and the slip sliding surface. Verify the alignment with the interface adapter and level. Inspect the journal bearings for any damage and if they moves freely. Refer to the OEM maintenance.
		Hoses	Before each test	Inspect hoses for leaks or damages, replace as required.
		Slip Sliding Surface	6m	Inspect the surface finish and the helical coil holes for any damages.
Bolts		6m	Perform a visual inspection for cracks or insert integrity in particular those located on the interface adapter (bullnose), replace as required.	
<b>Pneumatic</b>	Suspension System For	Air Regulator	12m	Inspect and calibrate the gauges.



System	Sub-System	Components	Frequency, month(s)	Maintenance requirement	
	Exciter Head	Airbags	12m	Inspect the airbags and the valves for cracks or damaged, clean the airbags and apply a layer of silicone on the cracks, replace as required.	
		Hoses	6m	Inspect hoses for leaks or damages, replace as required.	
	Suspension System For Extension Table	Airbags	12m	Inspect the airbags and the valves for cracks or damaged, clean the airbags and apply a layer of silicone on the cracks, replace as required.	
		Surface	6m	Inspect the surface finish and the helicoil holes for any damage.	
		Bolts	6m	Inspect the bolts that fix the extension table with the shaker for sign of over-torque or any damage. Replace as required.	
		Hoses	Before each test	Inspect hoses for leaks or damages, replace as required.	
	Suspension System For Seismic Mass	Airbags	12m	Inspect the airbags and the valves for cracks or damaged, clean the airbags and apply a layer of silicone on the cracks, replace as required.	
		Level Switches	12m	Test functionality, replace if defective	
	<b>Electrical</b>	Power Breakers	Breakers	12m	Perform electrical maintenance on C-150 shaker in accordance with the quality instruction INS-0020
		Instrumentations	Accelerometers	12m	
Cooling Systems Temperature Monitor		Cable	12m		
<b>Controls verification</b>	Computer	Measurements	12m	Inspection to ensure that is working IAW OEM specifications.	



System	Sub-System	Components	Frequency, month(s)	Maintenance requirement
	Abacus	Measurements	12m	Inspection to ensure that is working IAW OEM specifications.
	Armature Position Control For Exciter Head	Position Control	12m	Inspection to ensure that is working IAW OEM specifications.
	Seismic Mass Control Panel	Gauge	12m	Replace if defective.
		Switch	12m	Replace if defective.
	Piezotronics	PCB	12m	Inspection to ensure that is working IAW OEM specifications.
<b>Enclosure</b>	Safety	Paints	12m	Painting where required.
		Protection & Security	12m	Ensure that all security and protection systems are functional
		Walk-In	12m	Clean below the test cell for any dirt or debris.

Table 6: Current Shaker Maintenance Plan





## **10 APPENDIX 1: ELECTRODYNAMIC SHAKER TECHNICAL STATEMENT OF REQUIREMENTS**

### **10.1 GENERAL**

#### **10.1.1 Single Supplier**

10.1.1.1 The Contractor must supply the Shaker from a single manufacturer, including all components and ancillary equipment described in SOW Section 10 and required for proper operation in both vertical and horizontal planes.

#### **10.1.2 Proven design**

10.1.2.1 The Contractor must demonstrate that the proposed solution is a proven and quality design by providing a list of references of similar systems (model and size) installations, preferably located in Montreal (QC) area or otherwise in Canada.

#### **10.1.3 General Site Conditions**

10.1.3.1 The Contractor must validate the current site conditions before the installation of the Shaker. These services include but may not be limited to:

10.1.3.1.1 Site Electrical, Water and Compressed air supply; and,

10.1.3.1.2 Physical location and identify any obstacles

10.1.3.2 The Contractor must ensure that the site is kept clean and free of debris during the execution of the work. Upon completion of work the Contractor must remove all waste, temporary installations and tools from the construction site leaving the area as it was before the work started.

#### **10.1.4 Maintenance Support**

10.1.4.1 All work must be conducted by the OEM or an authorized local representative.

10.1.4.2 The Contractor must be available to conduct annual safety checks on the Shaker for at least a 24-month period.

10.1.4.3 The safety checks must include, but not be limited to:

10.1.4.3.1 Nominal verifications of main, auxiliary and ancillary machinery necessary for the adequate Shaker operation; and,

10.1.4.3.2 Any trials that confirm the proper operation of the Shaker and supporting systems.

10.1.4.4 The Contractor must be available to provide troubleshooting and support to NETE personnel in case of a catastrophic failure of any main, auxiliary and ancillary machinery necessary for the adequate Shaker operation for at least a 24-month period.

10.1.4.5 The contractor must:

10.1.4.5.1 Provide services in the manner that will permit timely response and troubleshooting support; and,

10.1.4.5.2 Be on NETE LaSalle site within 24 to 48 hours' notice in case of a major emergency.

#### **10.1.5 Commissioning & Training:**



10.1.5.1 The Contractor must provide support during the installation and perform initial commissioning including demonstration of system performance.

10.1.5.2 The Contractor must provide training to NETE staff training for the safe operation and preventative maintenance expected by the manufacturer. The Contractor must support a Site Acceptance Test (SAT) as per NETE provided Test Plan, covering typical trials to be conducted with the Shaker as per Applicable Documents in SOW section 2. The SATs duration must be no less than one (1) week.

#### 10.1.6 Documentation

10.1.6.1 The Contractor must provide NETE with:

10.1.6.1.1 A complete set of installation and equipment drawings, in both Hardcopy and Softcopy (.pdf).

10.1.6.1.2 All pertinent datasheets and manuals required to install, operate, calibrate and maintain the Shaker, in both Hardcopy and Softcopy (.pdf).

10.1.6.1.3 All relevant calibration and conformity certificates, in both Hardcopy and Softcopy (.pdf).

10.1.6.2 A complete listing of documents that will be provided at the completion of the project must be provided as part of the proposal.

10.1.6.3 All documents must be provided in English language as a minimum. If original documents are of French language origin, they must be provided in addition to their corresponding English translation(s).

#### 10.1.7 Warranty

10.1.7.1 A warranty for parts and labour for a minimum duration of one (1) year after SAT completion must be included with the procurement.

10.1.7.2 An option for five (5) year warranty and/or maintenance plan must also be provided in the quotation.

### 10.2 TECHNICAL SPECIFICATIONS

#### 10.2.1 Dimensions

10.2.1.1 Payload Weight (min): 4,536 kg (10,000 lbs) total, for all axis tests

10.2.1.2 Payload Size (min) (LxWxH): 1,500 x 1,500 x 2,140 mm (~60 x 60 x 84 inch), Center of Gravity (CG) at or below vertical midpoint

10.2.1.3 Shaker Height (max): 2,600 mm (~103 inch) max from concrete floor, including head expander in vertical plane

#### 10.2.2 Exciter

10.2.2.1 Bandwidth (min): 3 to 1,700 Hz

10.2.2.2 Displacement (min): 63.5 mm (2.5 inch) pk-pk continuously

10.2.2.3 Velocity (min): 1.5 m/s (59 inch/s)

10.2.2.4 Force Sine Peak (min): 187 kN (42,000 lbf)



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10.2.2.5	Armature Diameter (min):	600 mm (~24 inch) or 2.5 ratio to Head Expander size of 1,500 mm
10.2.2.6	Load Centering Capability:	Automatic at full load, compressed air available
10.2.2.7	Stray Magnetic Field limit (max):	1 mT (10 G) at 152 mm (6 inch) from Table Top
10.2.2.8	Cooling System:	Included with liquid to liquid heat exchanger, 15 l/min service water available at up to 30°C
10.2.2.9	Cooling System Acoustic Noise (max):	87 dBA at 1 m (as per SOR/86-304)
10.2.3 Head Expander		
10.2.3.1	Material:	Magnesium, Flat to $\pm 0.125$ mm (5 mils)
10.2.3.2	Test Area Size (min) (LxW):	1,500 x 1,500 mm (~60 x 60 inch) working area with round or chamfer corners
10.2.3.3	Inserts:	3/8"-16UNC threads on 4 x 4 inch grid and radial pattern matching exciter head, centered
10.2.3.4	Support & Guidance:	As required for maximum payload capacity, compressed air available.
10.2.4 Slip Table		
10.2.4.1	Material:	Magnesium, Flat to $\pm 0.125$ mm (5 mils)
10.2.4.2	Test Area Size (min) (LxW):	1,500 x 1,500 mm (~60 x 60 inch) working area with driver bar attached.
10.2.4.3	Inserts:	3/8"-16UNC threads on 4 x 4 inch grid and radial pattern matching exciter head at far end
10.2.4.4	Linear Bearings (min):	Hydrostatic linear bearings, including Hydraulic compressor
10.2.5 Power Amplifier		
10.2.5.1	Power Capacity (min):	Matching Exciter requirements and Impedance
10.2.5.1.1	The Contractor must demonstrate that the proposed amplifier shall be matching with the proposed Exciter (both to be provided by contractor).	



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10.2.5.2	Controller:	Compatibility required with NETE-owned controller: DataPhysics SignalStar Vector
10.2.5.2.1	The Contractor must demonstrate that their proposed solution is fully compatible with the existing DataPhysics SignalStar Vector controller (provided by NETE)..	
10.2.5.3	Analog Control Input (max):	10 V full scale audio signal, Adjustable attenuator desirable for low range operations.
10.2.5.4	Total Harmonic Distortion (max):	0.5% from 3 Hz to 1.7 kHz at 100% capacity (for current) 0.8% from 3 Hz to 1.7 kHz at 1% capacity
10.2.5.5	Signal to Noise ratio (min):	65 dB below full output level
10.2.5.6	Alarm Indicators:	Local power, temperature, pressure, limits, and Remote interface (Panel and/or Ethernet)
10.2.5.7	Safeties:	Emergency Stop buttons and Limit Interlocks for over-travel, temperatures, pressures, and currents
10.2.5.8	Power Supply:	NETE installations provide 575V three-phase delta 60 Hz electrical power from Hydro-Québec with current fitted capacity of 300 kVA. The Contractor must supply the appropriate isolation and/or conversion transformer required for their proposed shaker system. The Contractor must also provide the total input power requirements.
10.2.5.9	Power Filters:	3 phases RFI/EMI filters for main power supply
10.2.5.10	Power Cables (min):	18 m (60 feet) between Amplifier Cabinets and Exciter
10.2.5.11	Acoustic Noise level (max):	87 dBA max at 1m (as per SOR/86-304)

### 10.3 FACILITY MODIFICATIONS

#### 10.3.1 Seismic Mass

10.3.1.1 The Contractor must assist NETE with coordination, design and build of the proper foundation for the installation of the new Shaker, following instructions and guidance from the Shaker supplier and relevant technical experts.

10.3.1.2 If not integral to the Shaker design, a new sub-foundation reaction mass (seismic mass) for isolation with the building structure will be build. The reaction mass will be



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sized to a weight of at least 10 times the system force capacity and fitted on pneumatic mounts providing a natural frequency of 3 Hz or less.

### 10.3.2 Embedded Pit

10.3.2.1 The Contractor must assist NETE with coordination, design and build of an embedded pit, so the Shaker can be positioned as close to the ground level as possible, without impeding any future operations and installations. This configuration will provide an easy access to the slip table and exciter head for test equipment installation, maintenance and monitoring.

10.3.2.2 The pit arrangement must provide a walking surface with 1.5 m minimum clearance between moving surfaces and be equipped with the removable guard rails of its outer perimeter. The entire structure must be enclosed in a protective barrier fitted with enough space to host the amplifier cabinet and a control station for three (3) people sitting.

### 10.3.3 Ancillary and Auxiliary Systems

10.3.3.1 The Contractor must assist NETE with coordination, design, build, set-to-work and installation of the proper facility services for the new Shaker, as per specifications, guidelines and instructions from the Shaker manufacturer.

10.3.3.2 The work must at minimum include integration of the equipment with the building services and related controls (HVAC, electric, cooling water, compressed air, fire suppression, et cetera). All of the necessary systems must be collocated as much as possible and be accessible from the embedded pit. Such layout will provide easy access to all components requiring maintenance (filter, reservoir, indicators).

## 10.4 ON-SITE INSTALLATION

### 10.4.1 Coordination

10.4.1.1 NETE will coordinate the installation of the Shaker following the supplier provided instructions, including provisions and connection to all facility services such as electricity, service water and compressed air. The Contractor must provide all services specific requirements and particularized installation drawings for all Shaker components.

10.4.1.2 NETE will coordinate, if not integral to the Shaker design, the design and construction of a new sub-foundation reaction mass (seismic mass) for isolation with the building structure and any environmental noise. The reaction mass will be sized to a weight of at least 10 times the system force capacity and fitted with pneumatic mounts providing a natural frequency of 3 Hz or less. The Contractor must provide guidance and all requirements to design a proper foundation and reaction mass.

10.4.1.3 NETE will coordinate the design and installation of the embedded pit. This configuration will provide an easy access to the slip table and exciter head for test equipment installation, maintenance and monitoring. The pit arrangement will provide a walking surface with 1.5 m minimum clearance between moving surfaces and be equipped with the removable guard rails of its outer perimeter. The entire structure will be enclosed in a protective barrier fitted with enough space to host the amplifier cabinet and a control station for three (3) people sitting.



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## 10.4.2 Installation

- 10.4.2.1 NETE will coordinate the installation of the Shaker components and complete the services connections as per Contractor instructions and with his support. The Shaker may be lifted into position over the new foundation using the NETE overhead crane.
- 10.4.2.1.1 The Contractor must validate NETE overhead crane to ensure that it is adequate to lift the Shaker and any of its subsidiary components in place as described in the section 10.4.2.1. Otherwise, the Contractor must supply all necessary suitable lifting appliances to install the Shaker and all of its components.
- 10.4.2.2 The electrical power input will be fitted with a dedicated isolation transformer and inline EMI/RFI filters (or any OEM recommended filter components) to ensure both a clean power source to the Shaker and avoid contamination of the facility power network.
- 10.4.2.2.1 The Contractor must supply the necessary power input isolation transformer (if required) together with the inline EMI/RFI filters, including a minimum amount of filter spares.
- 10.4.2.3 The Shaker must have an electric grounding system (built-in or separate) providing electric isolation and stabilizing the voltage and current supplied to the Shaker. The Contractor must supply a compatible electric isolation system.
- 10.4.2.3.1 The Contractor must ensure and provide sufficient evidence to NETE that demonstrates the adequacy and the proper operation of the installed grounding system.
- 10.4.2.4 The Contractor must review the installation drawings provided by NETE, and perform a site inspection of the facility preparations before delivery of the system.



## 11 APPENDIX 2: LIST OF CDRLS

### 11.1 PROJECT MANAGEMENT CDRL DETAILS

#### 11.1.1 CDRL-PM-01

1	Sequence Number	PM-01
2	Title or Description of Data	Project Management Plan
3	Data Item Description of Data	DID-PM-01
4	Reference	SOW 4.2, 4.15.4, 4.15.5
5	First Submission	CA +10bd
6	Number of Copies	1 soft copy
7	TA Acceptance Requirements	Yes
8	Acceptance Lead Times	
9	Subsequent Submission	As required, if changes needed.
10	Remarks	Deliver via email

Table 7: CDRL-PM-01

#### 11.1.2 CDRL-PM-02

1	Sequence Number	PM-02
2	Title or Description of Data	Meeting Agendas and Supporting Documents
3	Data Item Description of Data	DID-PM-02
4	Reference	SOW 4.5
5	First Submission	Meeting Date -5bd
6	Number of Copies	1 soft copy
7	TA Acceptance Requirements	Yes
8	Acceptance Lead Times	2 bd
9	Subsequent Submission	N/A
10	Remarks	Deliver via email

Table 8: CDRL-PM-02

#### 11.1.3 CDRL-PM-03

1	Sequence Number	PM-03
2	Title or Description of Data	Meeting Minutes
3	Data Item Description of Data	DID-PM-03
4	Reference	SOW 4.6
5	First Submission	Meeting Date +5bd
6	Number of Copies	1 soft copy
7	TA Acceptance Requirements	Yes
8	Acceptance Lead Times	2 bd
9	Subsequent Submission	N/A
10	Remarks	Deliver via email

Table 9: CDRL-PM-03



#### 11.1.4 CDRL-PM-04

1	Sequence Number	PM-04
2	Title or Description of Data	Project Status Reports
3	Data Item Description of Data	DID-PM-04
4	Reference	SOW 4.10
5	First Submission	CA +30bd
6	Number of Copies	1 soft copy
7	TA Acceptance Requirements	No
8	Acceptance Lead Times	N/A
9	Subsequent Submission	Every 3rd PRM -5bd after 1 <sup>st</sup> submission
10	Remarks	Deliver via email

Table 10: CDRL-PM-04

#### 11.1.5 CDRL-PM-05

1	Sequence Number	PM-05
2	Title or Description of Data	Project Kick Off Meeting
3	Data Item Description of Data	DID-PM-05
4	Reference	SOW 4.8
5	First Submission	CA +10bd
6	Number of Copies	N/A
7	TA Acceptance Requirements	No
8	Acceptance Lead Times	N/A
9	Subsequent Submission	N/A
10	Remarks	N/A

Table 11: CDRL-PM-05

### 11.2 ENGINEERING CDRL DETAILS

#### 11.2.1 CDRL-EN-01

1	Sequence Number	EN-01
2	Title or Description of Data	Critical Design Documents
3	Data Item Description of Data	DID-EN-01
4	Reference	SOW 4.11
5	First Submission	No later than CA +60bd and not less than CDR -10bd
6	Number of Copies	1 soft copy + 1 hard copy (Drawings on 11x17 sized paper, Reports and other documents on 8 ½ x 11 sized paper, bound in a binder(s))
7	TA Acceptance Requirements	No
8	Acceptance Lead Times	N/A
9	Subsequent Submission	EN-02
10	Remarks	Deliver soft copy via email or FTP, hard copy by mail or courier

Table 12: CDRL-EN-01





11.2.1.1 CDRL-EN-02

1	Sequence Number	EN-02
2	Title or Description of Data	Technical Data Package
3	Data Item Description of Data	DID-EN-02
4	Reference	SOW 4.12
5	First Submission	PA -20bd
6	Number of Copies	1 soft copy + 1 hard copy (Drawings on 11x17 sized paper, Reports and other documents on 8 ½ x 11 sized paper, bound in a binder(s))
7	TA Acceptance Requirements	Yes
8	Acceptance Lead Times	10bd
9	Subsequent Submission	N/A
10	Remarks	Deliver soft copy via email or FTP, hard copy by mail or courier

Table 13: CDRL-EN-02

11.3 ACCEPTANCE CDRL DETAILS

11.3.1 CDRL-AP-01

1	Sequence Number	AP-01
2	Title or Description of Data	Shaker Acceptance Plan and Procedures
3	Data Item Description of Data	DID-AP-01
4	Reference	SOW 6
5	First Submission	CA +60bd
6	Number of Copies	1 soft copy
7	TA Approval Requirements	No
8	Acceptance Lead Times	5bd
9	Subsequent Submission	N/A
10	Remarks	Deliver via email or FTP

Table 14: CDRL-AP-01



11.4 TRAINING SUPPORT CDRL DETAILS

11.4.1 CDRL-TRG-01

1	Sequence Number	TRG-01
2	Title or Description of Data	Cadre Training and Training Package
3	Data Item Description of Data	DID-TRG-01
4	Reference	SOW 5.4, 5.5, 5.6, 5.7, 5.8
5	First Submission	PA -20bd
6	Number of Copies	First submission: 1 soft copy + 1 hard copy (Drawings on 11x17 sized paper, Reports and other documents on 8 ½ x 11 sized paper, bound in a binder(s)) Second submission: 10 hard copies (Drawings on 11x17 sized paper, Reports and other documents on 8 ½ x 11 sized paper, bound in a binder(s))
7	TA Acceptance Requirements	Yes
8	Acceptance Lead Times	10bd
9	Subsequent Submission	At time of Cadre Training Session
10	Remarks	First submission: Deliver soft copy via email or FTP, hard copy by mail or courier Second submission: Hand deliver hard copies to the cadre training session

Table 15: CDRL-TRG-01

11.4.2 CDRL-MTN-01

1	Sequence Number	MNT-01
2	Title or Description of Data	Maintenance Concept
3	Data Item Description of Data	DID-MTN-01
4	Reference	SOW 5.2
5	First Submission	PA -20bd
6	Number of Copies	1 soft copy + 1 hard copy (Drawings on 11x17 sized paper, Reports and other documents on 8 ½ x 11 sized paper, bound in a binder(s))
7	TA Acceptance Requirements	Yes
8	Acceptance Lead Times	10bd
9	Subsequent Submission	N/A
10	Remarks	Deliver via email

Table 16: CDRL-MTN-01



## 12 APPENDIX 3: LIST OF DIDS

### 12.1 PROJECT MANAGEMENT DIDS

#### 12.1.1 DID-PM-01

1. TITLE Project Management Plan		2. IDENTIFICATION NUMBER DID-PM-01	
3. DESCRIPTION / PURPOSE The Contractor must develop, implement and maintain a Shaker Project Management Plan (PMP) in order to fulfill the project management requirements of this SOW.			
4. APPROVAL DATE	5. OFFICE OF PRIMARY INTEREST (OPI) Technical Authority:		6. SPARE
7. APPLICATION / INTERRELATIONSHIP CDRL-PM-01 SOW Ref: Section 4.2			
8. ORIGINATOR		9. APPLICABLE FORMS	
10. PREPARATION INSTRUCTIONS			
10.1 The Project Management Plan (PMP) must be prepared in Contractor's format.			
10.2 Structure - The PMP must contain, as a minimum, the following sections: <ul style="list-style-type: none"> <li>• Management Organization, Communications and Responsibilities;</li> <li>• Work Breakdown Structure (to at least a sub-assembly level of detail for the design and construction) and including development activities for all non-construction deliverables (i.e. training manual(s));</li> <li>• Master Schedule (showing, at a minimum, all planned meetings, inspections, tests, trials, provisional acceptance(s), delivery(ies) and other major milestones);</li> <li>• The Contractor must provide a site specific Health and Safety (H&amp;S) Plan before the start of work on site. This plan includes: <ul style="list-style-type: none"> <li>○ Contractor's company H&amp;S Plan</li> <li>○ Site specific H&amp;S Plan</li> <li>○ Submit applicable Workplace Hazardous Material Information System (WHMIS) Safety Data Sheets (SDS)</li> </ul> </li> <li>• Quality Assurance Plan;</li> <li>• Inspections and Tests Plans;</li> <li>• Risk Register and Mitigation Strategy; and,</li> <li>• Cost Management Plan.</li> </ul>			

Table 17: DID-PM-01

#### 12.1.2 DID-PM-02

1. TITLE Meeting Agendas and Supporting Documents		2. IDENTIFICATION NUMBER DID-PM-02	
3. DESCRIPTION / PURPOSE The purpose of the Meeting / Teleconference / Conference Supporting Documentation and			



Agenda is to provide the proposed subject items for review and discussion.		
4. APPROVAL DATE	5. OFFICE OF PRIMARY INTEREST (OPI) Technical Authority:	6. SPARE
7. APPLICATION / INTERRELATIONSHIP CDRL-PM-02 SOW Ref: Section 4.5		
8. ORIGINATOR	9. APPLICABLE FORMS	
10. PREPARATION INSTRUCTIONS		
10.1 The Meeting Agendas and Supporting Documents must be prepared in Contractor's format.		
10.2 The Agenda must include the following: <ul style="list-style-type: none"> <li>• Purpose of the meeting;</li> <li>• List of expected attendees;</li> <li>• Time, date, location and expected duration of the meeting;</li> <li>• Facilities and equipment to be provided for attending personnel;</li> <li>• List of data items and documents to be reviewed or provided to support the meeting;</li> <li>• Copies of all data and documentation to be reviewed, and,</li> <li>• A copy of the current Action Item List where appropriate.</li> </ul>		

Table 18: DID-PM-02

12.1.3 DID-PM-03

1. TITLE Meeting Minutes	2. IDENTIFICATION NUMBER DID-PM-03	
3. DESCRIPTION / PURPOSE The purpose of Meeting / Teleconference / Conference Minutes is to document discussions, agreements and action items identified (with the responsible parties and closure dates) reached during subject meetings.		
4. APPROVAL DATE	5. OFFICE OF PRIMARY INTEREST (OPI) Technical Authority:	6.SPARE
7. APPLICATION / INTERRELATIONSHIP CDRL-PM-03 SOW Ref: Section 4.6		
8. ORIGINATOR	9. APPLICABLE FORMS	
10. PREPARATION INSTRUCTIONS		
10.1 Meeting / Teleconference / Conference Minutes must be prepared in the Contractor's format and must include the following information: <ul style="list-style-type: none"> <li>• Date and location of meeting; and,</li> <li>• Name, organization, phone number, e-mail address and title of each person that attended the meeting.</li> </ul>		



10.2	In addition, the minutes must include the following: <ul style="list-style-type: none"> <li>• Statement relating to the purpose and/or objective of the meeting; and,</li> <li>• The original agenda and any revisions to the agenda - this may be accomplished by reference to attachments or enclosures.</li> </ul>
10.3	Minutes must include a record of each agenda item and any additional items raised, discussed or reviewed during the meeting, including: <ul style="list-style-type: none"> <li>• A brief statement identifying the item or problem and their status;</li> <li>• A summary of pertinent information associated with the item;</li> <li>• Any decisions or recommendation associated with the item;</li> <li>• An action item - identifying the person or organization responsible for taking and/or co-ordinating required action with key dates; and,</li> <li>• An updated Action Item List with all open and closed items.</li> </ul>
10.4	Meeting minutes should be distributed, where possible, at the end of the meeting and signed by the responsible parties before leaving. Otherwise the meeting minutes must be delivered as directed in CDRL.

Table 19: DID-PM-03

12.1.4 DID-PM-04

1. TITLE Project Status Reports		2. IDENTIFICATION NUMBER DID-PM-04	
3. DESCRIPTION / PURPOSE The project status reports provide a chronological update on the project progress in comparison to the project management plan and project schedule.			
4. APPROVAL DATE	5. OFFICE OF PRIMARY INTEREST (OPI) Technical Authority:	6. SPARE	
7. APPLICATION / INTERRELATIONSHIP CDRL-PM-04 SOW Ref: Section 4.10			
8. ORIGINATOR		9. APPLICABLE FORMS	
10. PREPARATION INSTRUCTIONS 10.1 The Project Status Reports must be prepared in Contractor's format.			



10.2	<p>The project status report must indicate necessary amendments to the PMP, in particular the schedule, as appropriate.</p> <p>The Project Status Reports must include at least the following information:</p> <ul style="list-style-type: none"> <li>• A narrative report providing sufficient detail to enable the Contracting and the Technical Authorities to evaluate the progress of the work to date;</li> <li>• Risk management activities. Significant problems or concerns encountered together with recommended course of action. Such running risk management table must be updated periodically;</li> <li>• Schedules status, schedule changes and planned activities for the next reporting period;</li> <li>• A summary of any issues for meeting requirements / specifications;</li> <li>• Running summary of observations and problems that have been opened, are in progress or have been resolved; and,</li> <li>• Subset of Action Item List containing all open action items.</li> </ul>
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Table 20: DID-PM-04

12.1.5 DID-PM-05

1. TITLE Project Kickoff Meeting		2. IDENTIFICATION NUMBER DID-PM-05	
3. DESCRIPTION / PURPOSE The Project Kickoff Meeting is to review the project management plan and the project schedule.			
4. APPROVAL DATE	5. OFFICE OF PRIMARY INTEREST (OPI) Technical Authority:	6. SPARE	
7. APPLICATION / INTERRELATIONSHIP CDRL-PM-05 SOW Ref: Section 4.8			
8. ORIGINATOR		9. APPLICABLE FORMS	
10. PREPARATION INSTRUCTIONS			
10.1 The Project kick off meeting must include as a minimum: <ul style="list-style-type: none"> <li>• Meeting agenda;</li> <li>• A line by line review of the SOW (including in particular the Shaker Technical Requirements);</li> <li>• Overview of the project management plan; and,</li> <li>• Critical path activities.</li> </ul>			

Table 21: DID-PM-05

12.2 ENGINEERING DIDS

12.2.1 DID-EN-01

1. TITLE Critical Design Documents	2. IDENTIFICATION NUMBER DID-EN-01
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<b>3. DESCRIPTION / PURPOSE.</b> The Critical Design Documents must provide all of the review materials required for the Critical Design Review meeting.		
<b>4. APPROVAL DATE</b>	<b>5. OFFICE OF PRIMARY INTEREST (OPI)</b> Technical Authority:	<b>6. SPARE</b>
<b>7. APPLICATION / INTERRELATIONSHIP - APPLICATION / INTERDEPENDANCE</b> CDRL-EN-01 SOW Ref: Section 4.11		
<b>8. ORIGINATOR</b>	<b>9. APPLICABLE FORMS</b>	
<b>10. PREPARATION INSTRUCTIONS</b>		
10.1 The following document must be provided to, but not be limited to, the Critical Design Review meeting: <ul style="list-style-type: none"> <li>All data to prove that the Contractors solution meets all the technical and logistic requirements of the SOW.</li> </ul>		
10.2 Final documents provided by the Contractor must include (but are not limited to): <ul style="list-style-type: none"> <li>All stamped final drawings, diagrams, designs, or plans related to the Shaker and required for installation and proper operation;</li> <li>All additional final drawings, diagrams, designs, or plans necessary to demonstrate compliance with the requirements of this SOW;</li> <li>Final Inspections and Tests Plans including all applicable information required to complete AT (DID-AP-01);</li> <li>Identification of all Classification Society Certifications and Approvals required during construction;</li> <li>Final Shaker and associated equipment General Arrangement and layout drawings. All layout drawings must be superimposed onto the NETE Floor plan (SOW Section 2.1.2.14) where applicable; and,</li> <li>Updated build and delivery schedule.</li> </ul>		
10.2 The Contractor must: <ul style="list-style-type: none"> <li>Prepare the Critical Design Documents using metric units, unless the source of the original documentation is non-metric, and no changes to that original documentation are to be made;</li> <li>Prepare Critical Design Documents in the Contractors format; and,</li> <li>Present the Critical Design Documents to the TA prior to the design review meetings for review to check compliance with the SOW.</li> </ul>		

Table 22: DID-EN-01

12.2.2 DID-EN-02

<b>1. TITLE</b> Technical Data Package (TDP)	<b>2. IDENTIFICATION NUMBER</b> DID-EN-02
<b>3. DESCRIPTION / PURPOSE</b> The TDP is intended to provide the necessary data for NETE personnel to operate the Shaker.	



4. APPROVAL DATE	5. OFFICE OF PRIMARY INTEREST (OPI) Technical Authority:	4. APPROVAL DATE
7. APPLICATION / INTERRELATIONSHIP - APPLICATION / INTERDEPENDANCE CDRL-EN-02 DID-AP-01 SOW Ref: Section 4.12		
8. ORIGINATOR	9. APPLICABLE FORMS	
10. PREPARATION INSTRUCTIONS		
10.1 The Contractor must supply a complete set of technical drawings, in native format as well as in scalable pdf, for the Shaker, to allow for full identification of all components, as well as the performance of preventative and corrective maintenance.		
10.2 The TDP must include each of the following but is not limited to: <ul style="list-style-type: none"> <li>• Final Shaker, ancillary and auxiliary equipment General Arrangement and layout drawings;</li> <li>• Any additional Approved Drawings;</li> <li>• Updated versions of any drawings or reports submitted during CDR that are not otherwise included in this list;</li> <li>• Inspection Reports;</li> <li>• Final Inspections, Tests and Trials Report(s);</li> <li>• List of any relevant Certifications and Approvals;</li> <li>• Maintenance Documentation and or Manuals, where applicable;</li> <li>• Spare Parts List with OEM part numbers and supply details;</li> <li>• Any appropriate As-Fitted drawings/designs for the Shaker; and,</li> <li>• Outfit and As-Fitted Part List (List must include the following but is not limited to: detail type, size, material, location, manufacturer, OEM part numbers, and weight).</li> </ul>		

Table 23: DID-EN-02

### 12.3 ACCEPTANCE DIDS

#### 12.3.1 DID-AP-01

1. TITLE Shaker Acceptance Plan and Procedures	2. IDENTIFICATION NUMBER DID-AP-01	
3. DESCRIPTION / PURPOSE Deliver the plan and procedures for the Acceptance program to be used to verify the compliance of the Shaker, its equipment, and components in operational conditions at NETE LaSalle.		
4. APPROVAL DATE	5. OFFICE OF PRIMARY INTEREST (OPI) Technical Authority:	6. SPARE
7. APPLICATION / INTERRELATIONSHIP CDRL-AP-01 SOW Ref: Section 6		
8. ORIGINATOR	9. APPLICABLE FORMS	
10. PREPARATION INSTRUCTIONS		





10.1	Must be prepared by Contractor in Contractor's format.
10.2	<p>The Shaker Acceptance Plan and Procedures must include the following as a minimum:</p> <ul style="list-style-type: none"> <li>• Details of the plans and procedures for all inspections, tests and trialtrials necessary to verify the Shaker meets the requirements specified in the SOW and related references, including as a minimum of verification of operation as described in Section 6.2.5;</li> <li>• The list of prerequisite mandatory inspection reports required to verify compliance with the requirements of this SOW, in order to proceed with the Acceptance Test and Trials;</li> <li>• The detailed list of supplies and systems required to complete the test and trialtrials;</li> <li>• The list of the personnel required for the inspection, test or trial (as a minimum representatives from NETE and the Contractor must attend all inspections, tests and trialtrials used to verify Contractual compliance);</li> <li>• The environmental and personnel safety requirements related to the Shaker operation during the trial;</li> <li>• The approved test plan and recording data sheets to be filled during the inspection, test or trialtrial; and,</li> <li>• The sequential order and type of trials to be conducted on the Shaker and performances metrics to be obtained.</li> </ul>
10.3	<p>Contractor must develop and deliver an Acceptance schedule based on the Shaker Acceptance Plan and Procedures. The schedule must provide an estimated duration of each of the main activities where applicable.</p> <p>The schedule for all test activities must be integrated in the Master Schedule.</p>

Table 24: DID-AP-01

12.4 TRAINING SUPPORT DIDS

12.4.1 DID-TRG-01

1. TITLE Shaker Cadre Training and Training Package		2. IDENTIFICATION NUMBER DID-TRG-01	
3. DESCRIPTION / PURPOSE The Shaker cadre training agenda and plan will be for a cadre training session, provided at NETE LaSalle, QC, to provide NETE personnel with familiarization and maintenance training related to the operation of the Shaker.			
4. APPROVAL DATE	5. OFFICE OF PRIMARY INTEREST (OPI) Technical Authority:	6. SPARE	
7. APPLICATION / INTERRELATIONSHIP CDRL-TRG-01 DID-MTN-01 SOW Ref: Sections 5.4, 5.5, 5.6, 5.7, 5.8			
8. ORIGINATOR		9. APPLICABLE FORMS	
10. PREPARATION INSTRUCTIONS			



10.1	The Contractor must provide a Shaker familiarization and maintenance training package, in electronic format, to allow subsequent training of the equipment at NETE facility. One hard copy of the training package must be provided to each student at the cadre training
10.2	A Cadre training sessions will be held in LaSalle, Quebec. A maximum of 10 students will attend the training session. The Shaker familiarization and maintenance training will include, as a minimum: <ul style="list-style-type: none"><li>• Familiarization with the overall Shaker arrangements and any limits associated with each of these;</li><li>• An overview of the maintenance manual developed for the Shaker;</li><li>• Description of the preventative maintenance requirements, in particular those required on monthly basis duration;</li><li>• Demonstrations the repair procedures where applicable;</li><li>• Demonstrations of accessing the Shaker components with and without removing the major sub-assemblies;</li><li>• Demonstrations of the repair procedures for replacing a sub-assembly; and,</li><li>• Any other processes and/or procedures that the Contractor identifies as helpful to NETE for the ongoing maintenance and operation of the Shaker.</li></ul>
10.3	The Contractor will provide a Cadre training package which must include but is not limited to the following: <ul style="list-style-type: none"><li>• Outline;</li><li>• Training materials;</li><li>• Workbook/Manual/Text etc.; and,</li><li>• Appropriate training aids.</li></ul> The Contractor must provide NETE the right to reproduce, translate and use all provided training material. This includes the right to have third parties use this material on behalf of NETE.

Table 25: DID-TGR-01



12.4.2 DID-MTN-01

1. TITLE Shaker Maintenance Concept		2. IDENTIFICATION NUMBER DID-MTN-01							
3. DESCRIPTION / PURPOSE The Shaker Maintenance Concept must provide a complete set of maintenance plans that identify the required maintenance tasks and identify the logistics support resources needed to perform tasks.									
4. APPROVAL DATE		5. OFFICE OF PRIMARY INTEREST (OPI) Technical Authority:	6. SPARE						
7. APPLICATION / INTERRELATIONSHIP CDRL-MTN-01 DID-TRG-01 SOW Ref: Section 5.2									
8. ORIGINATOR		9. APPLICABLE FORMS							
10. PREPARATION INSTRUCTIONS									
10.1 Must be prepared in the Contractor's format.									
10.2 The submission must identify the required maintenance for each component including Repair By Replacement requirements. The data must be consolidated into one									
10.3 The data must be grouped into tables listing routine, calendar based and operating hour based tasks. An example of rudimentary breakout is shown below. Each interval within a category will be a column in its respective table.									
		<table border="1"> <thead> <tr> <th>Scheduled Task</th> <th>Interval</th> </tr> </thead> <tbody> <tr> <td>Routine Shop Floor Tasks</td> <td>Monthly or Yearly</td> </tr> <tr> <td>Monthly Maintenance Tasks</td> <td>e.g. 1, 3, 4, 6, 12, 18, 24, 36, 48 or 60 months</td> </tr> </tbody> </table>		Scheduled Task	Interval	Routine Shop Floor Tasks	Monthly or Yearly	Monthly Maintenance Tasks	e.g. 1, 3, 4, 6, 12, 18, 24, 36, 48 or 60 months
Scheduled Task	Interval								
Routine Shop Floor Tasks	Monthly or Yearly								
Monthly Maintenance Tasks	e.g. 1, 3, 4, 6, 12, 18, 24, 36, 48 or 60 months								
10.4 The Shaker Maintenance Concept must include a section presenting maintenance task data sheets that contain the following information for each maintenance task:									
<ul style="list-style-type: none"> <li>• Maintenance identification number;</li> <li>• Asset (equipment);</li> <li>• Description (brief, of maintenance item);</li> <li>• Steps/Process (including safety considerations, special tools required, applicable standards);</li> <li>• Frequency (number, i.e. 1, 500);</li> <li>• Frequency units (i.e. Hours, Months, Year);</li> <li>• Parts Required; and,</li> <li>• Estimated LOE (Level of Effort).</li> </ul>									

Table 26: DID-MTN-01



**MANDATORY EVALUATION CRITERIA  
FOR PROCUREMENT OF  
ELECTRODYNAMIC SHAKER SYSTEM**

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**LIST OF ACRONYMS AND ABBREVIATIONS**

<b>Acronyms or Abbreviations</b>	<b>Definition</b>
CA	Contract Award (in CDRL and DIDs)
CDR	Critical Design Review (meeting)
CDRL	Contract Deliverable Requirement List
CFTO	Canadian Forces Technical Order
CG	Centre of Gravity
CISD	Canadian Industrial Security Directorate
COTS	Commercial Off The Shelf
CSP	Contract Security Program
CTP	Cadre Training Package
dB	Decibels
dBA	A-weighted Decibels
DID	Data Item Description
DND	Department of National Defence
D Mar P	Director of Maritime Procurement
DOS	Designated Organization Screening
EMI	Electromagnetic Interference
FPM	Final Project Meeting
G	Acceleration of Gravity (9.82 m/s <sup>2</sup> )
GOC	Government of Canada
GOCO	Government-Owned-Contractor-Operated
Hz	Hertz
IAW	In Accordance With
in/s	inches per second
ISO	International Organization for Standardization
ITAR	International Traffic in Arms Regulations
ITP	Inspection and Test Plan
km	kilometre
kN	kilo Newton
kVA	Kilo-Volt-Ampere
lbf	pound-force
l/min	liter per minute
m	metre
mil	Thousandth of an inch
mm	millimetre
mT	millitesla
m <sup>2</sup>	square metres
m/s	meters per second
NETE	Naval Engineering Test Establishment
OEM	Original Equipment Manufacturer
PDF	Portable Document Format
PM	Project Manager



PMP	Project Management Plan
PRM	Project Review Meeting
PSPC	Public Services and Procurement Canada
PSR	Project Status Reports
PWGSC	Public Works and Government Services Canada
RCN	Royal Canadian Navy
RFI	Radio Frequency Interference
RFP	Request for Proposal
RSPL	Recommended Spare Parts List
SOW	Statement Of Work
SPT	Special Purpose Tools
TA	Technical Authority
TDP	Technical Data Package
THD	Total Harmonic Distortion
tonne(s)	Metric Tonne(s)
TSOR	Technical Statement of Requirements
UNC	Unified National Coarse (applicable to threads)
USA	United States of America
USML	Unites States Munitions List
V	Volt
VCR	Visit Clearance Request
WME	Weir Marine Engineering

Table 1: Acronyms and Abbreviations





## 1 COMPLIANCE AND TECHNICAL REQUIREMENTS EVALUATION MATRICES

### 1.1 GENERAL

1.1.1 This Annex contains the Compliance and Technical Requirements evaluation matrices.

### 1.2 PHASE 1 - MANDATORY BIDDERS COMPLIANCE CHECK

1.2.1 Mandatory Bidders Compliance check must be submitted together with the Bid.

1.2.2 Mandatory Bidders Compliance check uses the following abbreviations:

1.2.2.1 “A” – The Bidder must provide a compliance statement to clearly “Agree (A)” that the stated work will be completed, or that the stated requirement will be met; and,

1.2.2.2 “I” – The Bidder must include the requested “Information (I)” with the bid.

1.2.3 Bidder must be fully compliant with all of the mandatory requirements in the Phase 1 as outlined in the Table 2 below in order to be evaluated in Phase 2 (Section 1.3).

No.	SOW Ref	Requirement	Test Method	Bidders Response	Associated Definition(s)
GENERAL					
1.0	10.1.1	Single Supplier The Contractor must agree to supply the Shaker from a single manufacturer, including all components and ancillary equipment described in SOW Section 10 and required for proper operation in both vertical and horizontal planes.	Compliance statement.  <u>Evaluation:</u> Pass/Fail		“A”

Table 2: Mandatory Bidders Compliance Check



No.	SOW Ref	Requirement	Test Method	Bidders Response	Associated Definition(s)
1.1	10.1.2	<p>Proven Design</p> <p>The Contractor must demonstrate that the proposed solution is a proven and quality design by providing a list of references of similar systems (model and size) installations.</p>	<p>Provide list of references for at least two (2) similar systems (model and size) that were installed and set to work within the last 10 years.</p> <p><u>Evaluation:</u> Pass/Fail</p>		“T”
1.2	10.1.6	<p>Documentation (Initial)</p> <p>The Contractor must agree to make available a complete listing of documents that will be provided at the completion of the project as part of the proposal.</p>	<p>Compliance statement</p> <p><u>Evaluation:</u> Pass/Fail</p>		“A”
1.3	10.1.6	<p>Documentation (Final)</p> <p>The Contractor must agree to provide NETE with following documentation following provisional acceptance as per SOW 6.5.1:</p> <ul style="list-style-type: none"> <li>• A complete set of installation and equipment drawings, in both Hardcopy and Softcopy (.pdf).</li> <li>• All pertinent datasheets and manuals required to install, operate, calibrate and maintain the Shaker, in both Hardcopy and Softcopy (.pdf).</li> <li>• All relevant calibration and conformity certificates, in both Hardcopy and Softcopy (.pdf).</li> </ul> <p>All documents must be provided in English language as a minimum. If original documents are of French language origin, they must be provided in addition to their corresponding English translation(s).</p>	<p>Compliance statement</p> <p><u>Evaluation:</u> Pass/Fail</p>		“A”

Table 2: Mandatory Bidders Compliance Check



No.	SOW Ref	Requirement	Test Method	Bidders Response	Associated Definition(s)
1.4	3.1.1.1.2	The Contractor must demonstrate that the Shaker system is compliant with the Canadian Electrical Code (CEC) from the Canadian Standards Association (CSA) (see sections 2.1.2.6, 2.1.2.7, and 2.1.2.8.).	Provide Certification.  <u>Evaluation:</u> Pass/Fail		“T”
1.5	3.1.1.4	The Contractor and Subcontractor must hold or be eligible to hold a valid security clearance to the level of Confidential or higher issued by the Canadian Industrial Security Directorate (CISD) in order to perform work in NETE Operational Zone. A Visit Clearance Request (VCR) approved by CISD and Public Services and Procurement Canada (PSPC) is required for all Contractor or sub-Contractor personnel prior to conducting work at the NETE site.	Provide evidence of current certification or provide compliance statement of eligibility.  <u>Evaluation:</u> Pass/Fail		“A” or “T”
PROCUREMENT					
1.6	3.1.1.1.3	The Shaker and its related documentation must not contain information which falls into the International Traffic in Arms Regulations (ITAR) as defined in the Unites States Munitions List (USML).	Compliance statement.  <u>Evaluation:</u> Pass/Fail		“A”

Table 2: Mandatory Bidders Compliance Check



No.	SOW Ref	Requirement	Test Method	Bidders Response	Associated Definition(s)
1.7	4.1.1	<p>Project Manager The Contractor must assign a Project Manager responsible to carry out the work required for the Shaker delivery program. The Contractor’s Project Manager must have the authority to plan, direct, control and make decisions for the Contractor as these pertain to the execution of this Contract.</p> <p>Notes: The Contractor does not need to have the individual identified on-staff staff at time of bidding. However, Bidder must ensure that the proposed individual, or an equivalently qualified individual, is retained for the duration of the Contract.</p>	<p>Compliance statement. Demonstrate experience of the proposed PM by providing a portfolio that contains at least two (2) successfully completed projects of comparable scope to that described in the Statement of Work (Annex A) including activities such as planning, organization, and implementation, within the last 10 years.</p> <p><u>Evaluation:</u> Pass/Fail</p>		“T”

Table 2: Mandatory Bidders Compliance Check



No.	SOW Ref	Requirement	Test Method	Bidders Response	Associated Definition(s)
1.8	4.2 4.2.2 CDRL-PM-01 DID-PM-01	<p>Project Management Plan</p> <p>It is estimated that the delivery of the Shaker should be completed 12 months after Contract Award (CA) at the latest, followed by the installation and the set to work.</p> <p>The Contractor must agree to develop, implement and maintain a Shaker Project Management Plan (PMP) in order to fulfill the project management requirements of this SOW. At minimum, the PMP must contain:</p> <ul style="list-style-type: none"> <li>• Work Breakdown Structure (to at least a sub- assembly level of detail for the design and construction) and including development activities for all non-construction deliverables (i.e. training manual(s));</li> <li>• Master Schedule (showing, at a minimum, all planned meetings, inspections, tests, trials, provisional acceptance(s), delivery(ies) and other major milestones);</li> <li>• Quality Assurance Plan;</li> <li>• Inspections and Tests Plans;</li> <li>• Risk Register and Mitigation Strategy; and,</li> <li>• Cost Management Plan.</li> </ul> <p>The Contractor must agree deliver the PMP for NETE review within ten (10) business days after Contract Award.</p>	<p>Compliance statement.</p> <p><u>Evaluation:</u> Pass/Fail</p>		"A"

Table 2: Mandatory Bidders Compliance Check



No.	SOW Ref	Requirement	Test Method	Bidders Response	Associated Definition(s)
1.9	4.8 CDRL-PM-05 DID-PM-05	<p>Kick-Off Meeting</p> <p>The Contractor must agree that within ten (10) business days after Contract Award, the Contractor will convene and co-chair a project Kick Off Meeting, IAW CDRL item CDRL-PM-05 and DID-PM-05 at NETE LaSalle facility, via video or teleconference or elsewhere as agreed to between the Contractor and NETE.</p>	<p>Compliance statement.</p> <p><u>Evaluation:</u> Pass/Fail</p>		“A”
1.10	3.1.1.6	<p>The Contractor must agree that at the moment of submission, the proposal will include the following Shaker technical details:</p> <ul style="list-style-type: none"> <li>• Recommended installation layout and constraints (e.g. max distance between components);</li> <li>• Individual component details and drawings including physical dimension and weight, connection points, mounting interface requirement, lifting points;</li> <li>• Facility services requirements for installation (Electrical, Cooling Water, Compressed Air, etc.).</li> </ul>	<p>Provide required technical documents.</p> <p><u>Evaluation:</u> Pass/Fail</p>		“I”
FACILITY MODIFICATIONS					
1.11	10.3.1.1	<p>The Contractor must agree to provide guidance and relevant technical requirements to NETE for the foundation design.</p>	<p>Compliance statement.</p> <p><u>Evaluation:</u> Pass/Fail</p>		“A”

Table 2: Mandatory Bidders Compliance Check



No.	SOW Ref	Requirement	Test Method	Bidders Response	Associated Definition(s)
1.12	10.3.1.1	The Contractor must agree to provide guidance and relevant technical requirements to NETE for the sub-foundation (seismic mass) design.	Compliance statement. Demonstrate experience of the proposed sub-foundation (seismic mass) by providing a portfolio that contains at least two (2) successfully completed projects of similar capacity (meeting technical specifications in SOW 10.2). One (1) of the projects must be in North America.  <u>Evaluation:</u> Pass/Fail		“A” and “T”
1.13	10.3.2.1	The Contractor must agree to provide guidance and concurrence of embedded pit design and installation.	Compliance statement.  <u>Evaluation:</u> Pass/Fail		“A”
INSTALLATION					
1.14	10.4.2.4	The Contractor must agree to review the installation drawings provided by NETE, and to perform a site inspection of the facility preparations before delivery of the system.	Compliance statement.  <u>Evaluation:</u> Pass/Fail		“A”
1.15	3.1.1.1.2	The Contractor must agree to provide a CSA compliant system, to be inspected and certified on-site. Any corrections or upgrade required for CSA compliance are at the expense of the Contractor.	Compliance statement.  <u>Evaluation:</u> Pass/Fail		“A”

Table 2: Mandatory Bidders Compliance Check



No.	SOW Ref	Requirement	Test Method	Bidders Response	Associated Definition(s)
1.16	10.4.2.2 10.4.2.3	The Contractor must agree to provide the required power input isolation transformer (if required) and inline EMI/RFI filters to ensure both a clean power source to the Shaker and avoid contamination of the facility power network by the Shaker amplifier. A dedicated and common reference ground connection will be provided for the Shaker.	Compliance statement.  <u>Evaluation:</u> Pass/Fail		“A”
COMMISSIONING					
1.17	6.2.2	The Contractor must agree to perform an inspection of the installed system prior to the initial power up.	Compliance statement.  <u>Evaluation:</u> Pass/Fail		“A”
1.18	6.2.6	The Contractor must agree to perform initial commissioning of the Shaker (with support from NETE), including a written statement report on: <ul style="list-style-type: none"> <li>• Verification of all safety interlocks and limits;</li> <li>• Configuration of controller parameters for Shaker limits and scaling factors; and,</li> <li>• Define normal operating parameters.</li> </ul>	Compliance statement.  <u>Evaluation:</u> Pass/Fail		“A”
1.19	6.2.7	The Contractor must agree that upon successful completion of the SATs, the Contractor will present NETE with a written statement report on: <ul style="list-style-type: none"> <li>• Validation that all TSOR parameters are met;</li> <li>• Shaker Frequency Response (bare);</li> <li>• Head Expander Frequency Response (bare); and,</li> <li>• Slip Table Frequency Response (bare).</li> </ul>	Compliance statement.  <u>Evaluation:</u> Pass/Fail		“A”
1.20	5.1 5.2 5.4	The Contractor must agree to provide local staff training for safe operation and preventative maintenance of the system. This can be concurrent to SAT activities.	Compliance statement.  <u>Evaluation:</u> Pass/Fail		“A”

Table 2: Mandatory Bidders Compliance Check





No.	SOW Ref	Requirement	Test Method	Bidders Response	Associated Definition(s)
1.21	6.2.5	The Contractor must agree to conduct (with support from NETE) the following typical tests for an expected minimum duration of one (1) week to verify: <ul style="list-style-type: none"> <li>• D-03-003-019/SG-001 Sine Test (Horizontal &amp; Vertical) with typical load;</li> <li>• MIL-STD-167-1A Sine Test (Horizontal &amp; Vertical) with typical load;</li> <li>• MIL-STD-810H Method 514.8: Random Vibration, 5 to 50 Hz @ 0.0010 g<sup>2</sup>/Hz</li> <li>• MIL-STD-810H Method 514.8: Sine on Random Vibration;</li> <li>• MIL-STD-810H Method 514.8: Random (1 g<sup>2</sup>/Hz) on Random (0.030 g<sup>2</sup>/Hz) Vibration</li> <li>• MIL-STD-810H Method 516.8 Procedure 1: Sawtooth Shock Test at 20g;</li> <li>• MIL-STD-810H Method 516.8 Procedure 3: Trapezoidal Shock Test at 30g.</li> </ul>	Compliance statement.  <u>Evaluation:</u> Pass/Fail		“A”
1.22	5.3 10.4.2.2.1	Spares The Contractor must agree to provide a Recommended Spare Parts List (RPSL). The RSPL must contain the Contractor's recommendation for spares required to maintain the equipment for a 60-month period. This list must include the necessary spares for the inline EMI/RFI filters.	Compliance statement.  <u>Evaluation:</u> Pass/Fail		“A”

Table 2: Mandatory Bidders Compliance Check



No.	SOW Ref	Requirement	Test Method	Bidders Response	Associated Definition(s)
1.23	5.1 5.4 5.5 5.6 5.7 CDRL-TRG-01 DID-TRG-01	Training The Contractor must agree to provide necessary training sessions and training materials to the identified NETE personnel and outlined in the SOW Section 5 and CDRL-TRG-01 together with DID-TRG-01. All training materials must be in English language minimum.	Compliance statement.  <u>Evaluation:</u> Pass/Fail		"A"

Table 2: Mandatory Bidders Compliance Check



1.3 PHASE 2 - MANDATORY TECHNICAL REQUIREMENTS CHECK

1.3.1 This phase evaluates Bidder's specifications and supporting documents.

1.3.2 Evaluation Methodology:

1.3.2.1 A check mark will be placed in either "Pass" or "Fail" column in the Table 3 against each listed technical requirements entry.

1.3.2.2 Bidder must meet all mandatory technical requirements in order to be deemed compliant.

1.3.2.3 Bidders must not fill out "Pass" and "Fail" columns. Bidders are required to reference where in their bid the required technical data can be found in "Bidder's proposal reference" column.

No.	SOW Ref	Mandatory Technical Requirement	Bidder's Proposal Ref	Pass	Fail
DIMENSIONS					
2.1	10.2.1.1	Payload Weight (min): 4,536 kg (10,000 lbs) total, for all axis tests.			
2.2	10.2.1.2	Payload Size (min) (LxWxH): 1,500 x 1,500 x 2,140 mm (~60 x 60 x 84 inch), Center of Gravity (CG) at or below vertical midpoint			
2.3	10.2.1.3	Shaker Height (max): 2,600 mm (~103 inch) max from concrete floor, including head expander in vertical plane			
EXCITER					
2.4	10.2.2.1	Bandwidth (min): 3 to 1,700 Hz			
2.5	10.2.2.2	Displacement (min): 63.5 mm (2.5 inch) pk-pk continuously			
2.6	10.2.2.3	Velocity (min): 1.5 m/s (59 inch/s)			
2.7	10.2.2.4	Force Sine Peak (min): 187 kN (42,000 lbf)			
2.8	10.2.2.5	Armature Diameter (min): 600 mm (~24 inch) or 2.5 ratio to Head Expander size of 1,500 mm			
2.9	10.2.2.6	Load Centering Capability: Automatic at full load, compressed air available.			
2.10	10.2.2.7	Stray Magnetic Field limit (max): 1 mT (10 G) at 152 mm (6 inch) from Table Top			

Table 3: Mandatory Technical Requirements Check



No.	SOW Ref	Mandatory Technical Requirement	Bidder's Proposal Ref	Pass	Fail
2.11	10.2.2.8	Cooling System: Included with liquid to liquid heat exchanger, 15 l/min service water available at up to 30°C			
2.12	10.2.2.9	Cooling System Acoustic Noise (max): 87 dBA at 1 m (as per SOR/86-304)			
<b>HEAD EXPANDER</b>					
2.13	10.2.3.1	Material: Magnesium, Flat to ±0.125 mm (5 mils)			
2.14	10.2.3.2	Test Area Size (min) (LxW): 1,500 x 1,500 mm (~60 x 60 inch) working area with round or chamfer corners			
2.15	10.2.3.3	Inserts: 3/8"-16UNC threads on 4 x 4 inch grid and radial pattern matching exciter head, centered			
2.16	10.2.3.4	Support & Guidance: As required for maximum payload capacity, compressed air available			
<b>SLIP TABLE</b>					
2.17	10.2.4.1	Material: Magnesium, Flat to ±0.125 mm (5 mils)			
2.18	10.2.4.2	Test Area Size (min) (LxW): 1,500 x 1,500 mm (~60 x 60 inch) working area with driver bar attached			
2.19	10.2.4.3	Inserts: 3/8"-16UNC threads on 4 x 4 inch grid and radial pattern matching exciter head at far end.			
2.20	10.2.4.4	Linear Bearings (min): Hydrostatic linear bearings, including Hydraulic compressor.			
<b>POWER AMPLIFIER</b>					
2.21	10.2.5.1 10.2.5.1.1	Power Capacity (min): The Contractor must demonstrate that the proposed amplifier shall be matching with the proposed Exciter (both to be provided by Contractor).			
2.22	10.2.5.2 10.2.5.2.1 2.2.2.4	Controller: The Contractor must demonstrate that their proposed solution is fully compatible with the existing DataPhysics SignalStar Vector controller (provided by NETE).			
2.23	10.2.5.3	Analog Control Input (max): 10 V full scale audio signal, Adjustable attenuator desirable for low range operations.			

Table 3: Mandatory Technical Requirements Check



No.	SOW Ref	Mandatory Technical Requirement	Bidder's Proposal Ref	Pass	Fail
2.24	10.2.5.4	Total Harmonic Distortion (max): 0.5% from 3 Hz to 1.7 kHz at 100% capacity (for current) 0.8% from 3 Hz to 1.7 kHz at 1% capacity			
2.25	10.2.5.5	Signal to Noise ratio (min): 65 dB below full output level			
2.26	10.2.5.6	Alarm Indicators: Local power, temperature, pressure, limits, and Remote interface (Panel and/or Ethernet)			
2.27	10.2.5.7	Safeties: Emergency Stop buttons and Limit Interlocks for over-travel, temperatures, pressures, and currents			
2.28	10.2.5.8	Power Supply: NETE installations provide 575V three-phase delta 60 Hz electrical power from Hydro-Québec with current fitted capacity of 300 kVA. The Contractor must supply the appropriate isolation and/or conversion transformer required for their proposed shaker system. The Contractor must also provide the total input power requirements.			
2.29	10.2.5.9	Power Filters: 3 phases RFI/EMI filters for main power supply			
2.30	10.2.5.10	Power Cables (min): 18 m (60 feet) between Amplifier Cabinets and Exciter			
2.31	10.2.5.11	Acoustic Noise level (max): 87 dBA max at 1m (as per SOR/86-304)			
PNEUMATIC MOUNTS					
2.32	10.3.1.2	Shaker Mounts: The Shaker must be fitted with pneumatic mounts for isolation with the building structure and environmental noise, providing a natural frequency of 3 Hz or less			

Table 3: Mandatory Technical Requirements Check