



THE CITY OF WINNIPEG

TENDER

TENDER NO. 297-2025

SUPPLY & DELIVERY OF MICROWAVE FREQUENCY COUNTER/ANALYZER

TABLE OF CONTENTS

PART A - BID SUBMISSION

Form A: Bid/Proposal
Form B: Prices

PART B - BIDDING PROCEDURES

B1. Contract Title	1
B2. Submission Deadline	1
B3. Enquiries	1
B4. Confidentiality	1
B5. Addenda	1
B6. Substitutes	2
B7. Bid Submission	3
B8. Bid	3
B9. Prices	4
B10. Disclosure	4
B11. Conflict of Interest and Good Faith	4
B12. Qualification	6
B13. Opening of Bids and Release of Information	6
B14. Irrevocable Bid	7
B15. Withdrawal of Bids	7
B16. Evaluation of Bids	7
B17. Award of Contract	7

PART C - GENERAL CONDITIONS

C0. General Conditions	1
------------------------	---

PART D - SUPPLEMENTAL CONDITIONS

General

D1. General Conditions	1
D2. Scope of Work	1
D3. Definitions	1
D4. Contract Administrator	1
D5. Accessible Customer Service Requirements	1
D6. Unfair Labour Practices	2
D7. Information Management	3

Submissions

D8. Authority to Carry on Business	4
------------------------------------	---

Schedule of Work

D9. Commencement	4
D10. Delivery	5
D11. Liquidated Damages	5
D12. Supply Chain Disruption Schedule Delays	5
D13. Orders	6
D14. Records	6

Measurement and Payment

D15. Invoices	Error! Bookmark not defined.
D16. Payment	6

Warranty

D17. Warranty	6
---------------	---

Dispute Resolution

D18. Dispute Resolution	6
-------------------------	---

Third Party Agreements

D19. Funding and/or Contribution Agreement Obligations	7
--	---

PART E - SPECIFICATIONS

General

E1. Applicable Specifications	1
E2. Goods	1

PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 Supply & Delivery of Microwave Frequency Counter/Analyzer

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 4:00 p.m. Winnipeg time, November 4, 2025.

B2.2 The Contract Administrator or the Manager of Purchasing may extend the Submission Deadline by issuing an addendum at any time prior to the time and date specified in B2.1.

B3. ENQUIRIES

B3.1 All enquiries shall be directed to the Contract Administrator identified in D4.1.

B3.2 If the Bidder finds errors, discrepancies or omissions in the Tender, or is unsure of the meaning or intent of any provision therein, the Bidder shall promptly notify the Contract Administrator of the error, discrepancy or omission at least five (5) Business Days prior to the Submission Deadline.

B3.3 Responses to enquiries which, in the sole judgment of the Contract Administrator, require a correction to or a clarification of the Tender will be provided by the Contract Administrator to all Bidders by issuing an addendum.

B3.4 Responses to enquiries which, in the sole judgment of the Contract Administrator, do not require a correction to or a clarification of the Tender will be provided by the Contract Administrator only to the Bidder who made the enquiry.

B3.5 The Bidder shall not be entitled to rely on any response or interpretation received pursuant to B3 unless that response or interpretation is provided by the Contract Administrator in writing.

B3.6 Any enquiries concerning submitting through MERX should be addressed to:
MERX Customer Support
Phone: 1-800-964-6379
Email: merx@merx.com

B4. CONFIDENTIALITY

B4.1 Information provided to a Bidder by the City or acquired by a Bidder by way of further enquiries or through investigation is confidential. Such information shall not be used or disclosed in any way without the prior written authorization of the Contract Administrator. The use and disclosure of the confidential information shall not apply to information which:

- (a) was known to the Bidder before receipt hereof; or
- (b) becomes publicly known other than through the Bidder; or
- (c) is disclosed pursuant to the requirements of a governmental authority or judicial order.

B4.2 The Bidder shall not make any statement of fact or opinion regarding any aspect of the Tender to the media or any member of the public without the prior written authorization of the Contract Administrator.

B5. ADDENDA

B5.1 The Contract Administrator may, at any time prior to the Submission deadline, issue addenda correcting errors, discrepancies or omissions in the Tender, or clarifying the meaning or intent of any provision therein.

- B5.2 The Contract Administrator will issue each addendum at least two (2) Business Days prior to the Submission Deadline, or provide at least two (2) Business Days by extending the Submission Deadline.
- B5.3 Addenda will be available on the MERX website at www.merx.com.
- B5.4 The Bidder is responsible for ensuring that they have received all addenda and is advised to check the MERX website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.
- B5.5 The Bidder shall acknowledge receipt of each addendum in Paragraph 10 of Form A: Bid/Proposal. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.
- B5.6 Notwithstanding B3, enquiries related to an Addendum may be directed to the Contract Administrator indicated in D4.

B6. SUBSTITUTES

- B6.1 The Work is based on the materials, equipment, methods and products specified in the Tender.
- B6.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.
- B6.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least five (5) Business Days prior to the Submission Deadline.
- B6.4 The Bidder shall ensure that any and all requests for approval of a substitute:
- (a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the material, equipment, method or product as either an approved equal or alternative;
 - (b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;
 - (c) identify any anticipated cost or time savings that may be associated with the substitute;
 - (d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the Contract;
 - (e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the Contract.
- B6.5 The Contract Administrator, after assessing the request for approval of a substitute, may in their sole discretion grant approval for the use of a substitute as an “approved equal” or as an “approved alternative”, or may refuse to grant approval of the substitute.
- B6.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, to the Bidder who requested approval of the substitute.
- B6.6.1 The Contract Administrator will issue an Addendum, disclosing the approved materials, equipment, methods and products to all potential Bidders. The Bidder requesting and obtaining the approval of a substitute shall be responsible for disseminating information regarding the approval to any person or persons they wish to inform.
- B6.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.

B6.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may base their Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B16.

B6.9 No later claim by the Contractor for an addition to the price(s) because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.

B7. BID SUBMISSION

B7.1 The Bid shall consist of the following components:

- (a) Form A: Bid/Proposal;
- (b) Form B: Prices;

B7.2 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely.

B7.3 The Bid shall be submitted electronically through MERX at www.merx.com.

B7.3.1 Bids will **only** be accepted electronically through MERX.

B7.4 Bidders are advised that inclusion of terms and conditions inconsistent with the Tender document, including the General Conditions, will be evaluated in accordance with B16.1(a).

B8. BID

B8.1 The Bidder shall complete Form A: Bid/Proposal, making all required entries.

B8.2 Paragraph 2 of Form A: Bid/Proposal shall be completed in accordance with the following requirements:

- (a) if the Bidder is a sole proprietor carrying on business in their own name, their name shall be inserted;
- (b) if the Bidder is a partnership, the full name of the partnership shall be inserted;
- (c) if the Bidder is a corporation, the full name of the corporation shall be inserted;
- (d) if the Bidder is carrying on business under a name other than their own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.

B8.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B8.2.

B8.3 In Paragraph 3 of Form A: Bid/Proposal, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.

B8.4 Paragraph 13 of Form A: Bid/Proposal shall be signed in accordance with the following requirements:

- (a) if the Bidder is a sole proprietor carrying on business in their own name, it shall be signed by the Bidder;
- (b) if the Bidder is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;
- (c) if the Bidder is a corporation, it shall be signed by their duly authorized officer or officers.
- (d) if the Bidder is carrying on business under a name other than their own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.

B8.4.1 The name and official capacity of all individuals signing Form A: Bid/Proposal should be entered below such signatures.

B8.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid and the Contract, when awarded, shall be both joint and several.

B9. PRICES

B9.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.

B9.1.1 Prices on Form B: Prices shall include:

- (a) duty;
- (b) freight and cartage;
- (c) Provincial and Federal taxes [except the Goods and Services Tax (GST) and Manitoba Retail Sales Tax (MRST, also known as PST), which shall be extra where applicable] and all charges governmental or otherwise paid;
- (d) profit and all compensation which shall be due to the Contractor for the Work and all risks and contingencies connected therewith.

B9.1.2 Prices on Form B: Prices shall not include Environmental Handling Charges (EHC) or fees, which shall be extra where applicable.

B9.2 The quantities listed on Form B: Prices are to be considered approximate only. The City will use said quantities for the purpose of comparing Bids.

B9.3 The quantities for which payment will be made to the Contractor are to be determined by the Work actually performed and completed by the Contractor, to be measured as specified in the applicable Specifications.

B9.4 The Bidder shall enter the Total Bid Price from Form B: Prices into the Total Bid Price field in MERX.

B9.5 Bidders are advised that the calculation indicated in B16.4 will prevail over the Total Bid Price entered in MERX.

B10. DISCLOSURE

B10.1 Various Persons provided information or services with respect to this Work. In the City's opinion, this relationship or association does not create a conflict of interest because of this full disclosure. Where applicable, additional material available as a result of contact with these Persons is listed below.

B10.2 The Persons are:

- (a) Testforce Systems Inc. Provided budget estimate.

B10.3 Additional Material: none

B11. CONFLICT OF INTEREST AND GOOD FAITH

B11.1 Further to C3.2, Bidders, by responding to this Tender, declare that no Conflict of Interest currently exists, or is reasonably expected to exist in the future.

B11.2 Conflict of Interest means any situation or circumstance where a Bidder or employee of the Bidder proposed for the Work has:

- (a) other commitments;

- (b) relationships;
- (c) financial interests; or
- (d) involvement in ongoing litigation;

that could or would be seen to:

- (i) exercise an improper influence over the objective, unbiased and impartial exercise of the independent judgment of the City with respect to the evaluation of Bids or award of the Contract; or
- (ii) compromise, impair or be incompatible with the effective performance of a Bidder's obligations under the Contract;
- (e) has contractual or other obligations to the City that could or would be seen to have been compromised or impaired as a result of their participation in the Tender process or the Work; or
- (f) has knowledge of confidential information (other than confidential information disclosed by the City in the normal course of the Tender process) of strategic and/or material relevance to the Tender process or to the Work that is not available to other bidders and that could or would be seen to give that Bidder an unfair competitive advantage.

B11.3 In connection with their Bid, each entity identified in B11.2 shall:

- (a) avoid any perceived, potential or actual Conflict of Interest in relation to the procurement process and the Work;
- (b) upon discovering any perceived, potential or actual Conflict of Interest at any time during the Tender process, promptly disclose a detailed description of the Conflict of Interest to the City in a written statement to the Contract Administrator; and
- (c) provide the City with the proposed means to avoid or mitigate, to the greatest extent practicable, any perceived, potential or actual Conflict of Interest and shall submit any additional information to the City that the City considers necessary to properly assess the perceived, potential or actual Conflict of Interest.

B11.4 Without limiting B11.3, the City may, in their sole discretion, waive any and all perceived, potential or actual Conflicts of Interest. The City's waiver may be based upon such terms and conditions as the City, in their sole discretion, requires to satisfy itself that the Conflict of Interest has been appropriately avoided or mitigated, including requiring the Bidder to put into place such policies, procedures, measures and other safeguards as may be required by and be acceptable to the City, in their sole discretion, to avoid or mitigate the impact of such Conflict of Interest.

B11.5 Without limiting B11.3, and in addition to all contractual or other rights or rights at law or in equity or legislation that may be available to the City, the City may, in their sole discretion:

- (a) disqualify a Bidder that fails to disclose a perceived, potential or actual Conflict of Interest of the Bidder or any of their employees proposed for the Work;
- (b) require the removal or replacement of any employees proposed for the Work that has a perceived, actual or potential Conflict of Interest that the City, in their sole discretion, determines cannot be avoided or mitigated;
- (c) disqualify a Bidder or employees proposed for the Work that fails to comply with any requirements prescribed by the City pursuant to B11.4 to avoid or mitigate a Conflict of Interest; and
- (d) disqualify a Bidder if the Bidder, or one of their employees proposed for the Work, has a perceived, potential or actual Conflict of Interest that, in the City's sole discretion, cannot be avoided or mitigated, or otherwise resolved.

B11.6 The final determination of whether a perceived, potential or actual Conflict of Interest exists shall be made by the City, in their sole discretion.

B12. QUALIFICATION

B12.1 The Bidder shall:

- (a) undertake to be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba, or if the Bidder does not carry on business in Manitoba, in the jurisdiction where the Bidder does carry on business; and
- (b) be financially capable of carrying out the terms of the Contract; and
- (c) have all the necessary experience, capital, organization, and equipment to perform the Work in strict accordance with the terms and provisions of the Contract.

B12.2 The Bidder and any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:

- (a) be responsible and not be suspended, debarred or in default of any obligations to the City. A list of suspended or debarred individuals and companies is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Purchasing Division website at <https://www.winnipeg.ca/matmgt/Templates/files/debar.pdf>

B12.3 The Bidder and/or any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:

- (a) have successfully carried out work similar in nature, scope and value to the Work; and
- (b) be fully capable of performing the Work required to be in strict accordance with the terms and provisions of the Contract;
- (c) have a written workplace safety and health program, if required, pursuant to The Workplace Safety and Health Act (Manitoba); and
- (d) have completed the Accessible Customer Service online training required by the Accessibility for Manitobans Act (AMA) (see B12.4 and D5).

B12.4 Further to B12.3(d), the Bidder acknowledges they and all Subcontractors have obtained training required by the Accessibility for Manitobans Act (AMA) available at [Accessibility Training](#) for anyone that may have any interaction with the public on behalf of the City of Winnipeg.

B12.5 The Bidder shall submit, within three (3) Business Days of a request by the Contract Administrator, proof satisfactory to the Contract Administrator of the qualifications of the Bidder and of any proposed Subcontractor.

B12.6 The Bidder shall provide, on the request of the Contract Administrator, full access to any of the Bidder's equipment and facilities to confirm, to the Contract Administrator's satisfaction, that the Bidder's equipment and facilities are adequate to perform the Work.

B13. OPENING OF BIDS AND RELEASE OF INFORMATION

B13.1 Bids will not be opened publicly.

B13.2 Following the Submission Deadline, the names of the Bidders and their Total Bid Prices (unevaluated and pending review and verification of conformance with requirements) will be available on the MERX website at www.merx.com.

B13.3 After award of Contract, the name(s) of the successful Bidder(s) and their Contract amount(s) will be available on the MERX website at www.merx.com.

B13.4 The Bidder is advised that any information contained in any Bid may be released if required by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law or by City policy or procedures (which may include access by members of City Council).

- B13.4.1 To the extent permitted, the City shall treat as confidential information, those aspects of a Bid Submission identified by the Bidder as such in accordance with and by reference to Part 2, Section 17 or Section 18 or Section 26 of The Freedom of Information and Protection of Privacy Act (Manitoba), as amended.

B14. IRREVOCABLE BID

- B14.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 11 of Form A: Bid/Proposal.
- B14.2 The acceptance by the City of any Bid shall not release the Bids of the next two lowest evaluated responsive Bidders and these Bidders shall be bound by their Bids on such Work until a Contract for the Work has been duly formed and the contract securities have been furnished as herein provided, but any Bid shall be deemed to have lapsed unless accepted within the time period specified in Paragraph 11 of Form A: Bid/Proposal.

B15. WITHDRAWAL OF BIDS

- B15.1 A Bidder may withdraw their Bid without penalty at any time prior to the Submission Deadline.

B16. EVALUATION OF BIDS

- B16.1 Award of the Contract shall be based on the following bid evaluation criteria:
- (a) compliance by the Bidder with the requirements of the Tender, or acceptable deviation therefrom (pass/fail);
 - (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B12 (pass/fail);
 - (c) Total Bid Price;
 - (d) economic analysis of any approved alternative pursuant to B6;
- B16.2 Further to B16.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid Submission is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities. The Award Authority may reject all or any part of any Bid, or waive technical requirements or minor informalities or irregularities if the interests of the City so require.
- B16.3 Further to B16.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in their Bid or in other information required to be submitted, that they are qualified.
- B16.4 Further to B16.1(c), the Total Bid Price shall be the sum of the quantities multiplied by the unit prices for each item shown on Form B: Prices.
- B16.4.1 Further to B16.1(a), in the event that a unit price is not provided on Form B: Prices, the City may determine the unit price by dividing the Amount (extended price) by the approximate quantity, for the purposes of evaluation and payment.
- B16.4.2 Bidders are advised that the calculation indicated in B16.4 will prevail over the Total Bid Price entered in MERX.
- B16.5 This Contract will be awarded as a whole.

B17. AWARD OF CONTRACT

- B17.1 The City will give notice of the award of the Contract or will give notice that no award will be made.
- B17.2 The City will have no obligation to award a Contract to a Bidder, even though one or all of the Bidders are determined to be qualified, and the Bids are determined to be responsive.

- B17.2.1 Without limiting the generality of B17.2, the City will have no obligation to award a Contract where:
- (a) the prices exceed the available City funds for the Work;
 - (b) the prices are materially in excess of the prices received for similar work in the past;
 - (c) the prices are materially in excess of the City's cost to perform the Work, or a significant portion thereof, with their own forces;
 - (d) only one Bid is received; or
 - (e) in the judgment of the Award Authority, the interests of the City would best be served by not awarding a Contract.
- B17.3 Where an award of Contract is made by the City, the award shall be made to the qualified Bidder submitting the lowest evaluated responsive Bid, in accordance with B16.
- B17.4 Further to Paragraph 7 of Form A: Bid/Proposal and C4, the City may issue a purchase order to the successful Bidder in lieu of the execution of a Contract.
- B17.4.1 The Contract Documents, as defined in C1.1(p), in their entirety shall be deemed to be incorporated in and to form a part of the purchase order notwithstanding that they are not necessarily attached to or accompany said purchase order.
- B17.5 Following the award of contract, a Bidder will be provided with information related to the evaluation of their Bid upon written request to the Contract Administrator.

PART C - GENERAL CONDITIONS

C0. GENERAL CONDITIONS

- C0.1 The *General Conditions for the Supply of Goods* (Revision 2020-01-31) are applicable to the Work of the Contract.
- C0.1.1 The *General Conditions for the Supply of Goods* are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Purchasing Division website at http://www.winnipeg.ca/matmgt/gen_cond.stm
- C0.2 A reference in the Tender to a section, clause or subclause with the prefix “C” designates a section, clause or subclause in the *General Conditions for Supply of Goods*.

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

- D1.1 In addition to the *General Conditions for the Supply of Goods*, these Supplemental Conditions are applicable to the Work of the Contract.

D2. SCOPE OF WORK

- D2.1 The Work to be done under the Contract shall consist of Supply of a Microwave Frequency Counter/Analyzer (New) to be used as a tool for measurement, analysis and calibration of Microwave Frequency, Power, and Pulsed RF time parameters like pulse width and Pulse Repetition Interval (PRI).

D3. DEFINITIONS

- D3.1 When used in this Tender:
- (a) “**PRI**” means Pulse Repetition Interval.
 - (b) “**RF**” means Radio Frequency.
 - (c) “ **Supply Chain Disruption** ” means an inability by the Contractor to obtain goods or services from third parties necessary to perform the Work of the Contract within the schedule specified therein, despite the Contractor making all reasonable commercial efforts to procure same. Contractors are advised that increased costs do not, in and of themselves, amount to a Supply Chain Disruption.

D4. CONTRACT ADMINISTRATOR

- D4.1 The Contract Administrator is:
Olawale D. Jegede P.Eng.
Coordinator – Communication Systems Branch
Telephone No.: 204 391 5859
Email Address: ojegede@winnipeg.ca

D5. ACCESSIBLE CUSTOMER SERVICE REQUIREMENTS

- D5.1 The Accessibility for Manitobans Act (AMA) imposes obligations on The City of Winnipeg to provide accessible customer service to all persons in accordance with the Customer Service Standard Regulation (“CSSR”) to ensure inclusive access and participation for all people who live, work or visit Winnipeg regardless of their abilities.
- D5.1.1 The Contractor agrees to comply with the accessible customer service obligations under the CSSR and further agrees that when providing the Goods or Services or otherwise acting on the City of Winnipeg’s behalf, shall comply with all obligations under the AMA applicable to public sector bodies.
- D5.1.2 The accessible customer service obligations include, but are not limited to:
- (a) providing barrier-free access to goods and services;
 - (b) providing reasonable accommodations;
 - (c) reasonably accommodating assistive devices, support persons, and support animals;
 - (d) providing accessibility features e.g. ramps, wide aisles, accessible washrooms, power doors and elevators;
 - (e) inform the public when accessibility features are not available;

- (f) providing a mechanism or process for receiving and responding to public feedback on the accessibility of all goods and services; and
- (g) providing adequate training of staff and documentation of same.

D6. SUPPLIER CODE OF CONDUCT

- D6.1 The Contractor has reviewed and understands the City's Supplier Code of Conduct. This document is located at: <https://www.winnipeg.ca/media/4891>
- D6.2 The Contractor agrees to comply with the Supplier Code of Conduct as it may be amended or replaced from time to time. The Contractor is responsible for periodically checking the above link for updates to the Supplier Code of Conduct. Contract signature on Form A: Bid/Proposal from the Contractor signifies agreement to the Supplier Code of Conduct which comes into effect once the Contract starts.
- D6.3 If there is a conflict between the Contract and the Supplier Code of Conduct – the Contract will prevail.

D7. UNFAIR LABOUR PRACTICES

- D7.1 Further to C3.2, the Contractor declares that in bidding for the Work and in entering into this Contract, the Contractor and any proposed Subcontractor(s) conduct their respective business in accordance with established international codes embodied in United Nations Universal Declaration of Human Rights (UDHR) <https://www.un.org/en/about-us/universal-declaration-of-human-rights> International Labour Organization (ILO) [https://www.ilo.org/global/lang--en/index.htm](https://www.ilo.org/global/lang-en/index.htm) conventions as ratified by Canada.
- D7.2 The City of Winnipeg is committed and requires its Contractors and their Subcontractors, to be committed to upholding and promoting international human and labour rights, including fundamental principles and rights at work covered by ILO eight (8) fundamental conventions and the United Nations Universal Declaration of Human Rights which includes child and forced labour.
- D7.3 Upon request from the Contract Administrator, the Contractor shall provide disclosure of the sources (by company and country) of the raw materials used in the Work and a description of the manufacturing environment or processes (labour unions, minimum wages, safety, etc.).
- D7.4 Failure to provide the evidence required under D7.3, may be determined to be an event of default in accordance with C16.
- D7.5 In the event that the City, in its sole discretion, determines the Contractor to have violated the requirements of this section, it will be considered a fundamental breach of the Contract and the Contractor shall pay to the City a sum specified by the Contract Administrator in writing ("Unfair Labour Practice Penalty"). Such a violation shall also be considered an Event of Default, and shall entitle the City to pursue all other remedies it is entitled to in connection with same pursuant to the Contract.
- D7.5.1 The Unfair Labour Practice Penalty shall be such a sum as determined appropriate by the City, having due regard to the gravity of the Contractor's violation of the above requirements, any cost of obtaining replacement goods/ services or rectification of the breach, and the impact upon the City's reputation in the eyes of the public as a result of same.
- D7.5.2 The Contractor shall pay the Unfair Labour Practice Penalty to the City within thirty (30) Calendar Days of receiving a demand for same in accordance with D7.5. The City may also hold back the amount of the Unfair Labour Practice Penalty from payment for any amount it owes the Contractor.
- D7.5.3 The obligations and rights conveyed by this clause survive the expiry or termination of this Contract, and may be exercised by the City following the performance of the Work, should

the City determine, that a violation by the Contractor of the above clauses has occurred following same. In no instance shall the Unfair Labour Practice Penalty exceed the total of twice the Contract value.

D8. INFORMATION MANAGEMENT

- D8.1 The following provisions are in addition to any preceding obligations of confidentiality contained in this document. All requirements apply to the Contractor. Further, where the Services &/or Work is being provided by a third party (either by a Subcontractor or authorized third party reseller), the Contractor represents and warrants that it will ensure that the third party meets all of the relevant requirements of the Information Management clauses and will assume responsibility and liability for the third party's compliance or non-compliance.
- D8.2 The Contractor acknowledges that The Freedom of Information and Protection of Privacy Act ("FIPPA") and Personal Health Information Act ("PHIA") imposes obligations on the City to collect, store, use, disclose, and destroy "personal information", as that term is defined in FIPPA, ("Personal Information") in the strictest of confidence and in accordance with FIPPA and PHIA.
- D8.3 The Contractor:
- (a) Shall be deemed to be an Information Manager as that term is defined in FIPPA;
 - (b) Shall be responsible to ensure that all Personal Information is collected, stored, used, disclosed or destroyed only and strictly in accordance with the Contract; and
 - (c) Shall, in respect of all Personal Information, implement and comply with the security requirements, controls, policies, and standards set out in the Contract and the Specifications.
- D8.4 While this Contract is in effect, and at all times thereafter, the Contractor shall treat as confidential any and all Confidential Information which it acquires or that is collected, stored, used, disclosed or destroyed, or to which it is given access, or which in any other way it comes into possession or knowledge of, during the course of the performance of the Contract. For the purposes of this Contract, Personal Information shall be considered to be Confidential Information.
- D8.5 The Contractor shall comply with section 44.1 of FIPPA, and more generally, any collection, storage, use, disclosure or destruction of Personal Information by the Contractor shall be in compliance with FIPPA and PHIA.
- D8.6 Further to C21 of the General Conditions, all Confidential Information is and shall remain the property of the City.
- D8.7 The Contractor shall not disclose or appropriate to their own use, or to the use of any third party, all or any part of the Confidential Information without the prior written consent of the Contract Administrator. The Contractor shall not at any time make any public announcement, press release, or statement of fact or opinion regarding the Bid Opportunity, the Contract, the Work, the City, or the Confidential Information without the prior written consent of the Contract Administrator.
- D8.8 While this Contract is in effect and at all times thereafter the Contractor shall: (a) only collect, store, use, disclose or destroy the Confidential Information for the purposes expressly permitted by the City, and only to the extent necessary to perform its obligations under this Contract:
- (a) ensure that access to the Confidential Information is only provided or permitted a "need to know" basis, and that access, when given, shall be the minimum amount necessary to accomplish the task;
 - (b) not disclose or permit the disclosure of the Confidential Information or any copies thereof, whether in whole or in part, in any form or medium, to any third party, including Subcontractors or agents, without the prior written consent of the Contract Administrator;

- (c) not reproduce any Confidential Information, in whole or in part, in any form or medium, without the express prior written consent of the Contract Administrator; and
 - (d) inform its Subcontractors of the obligations imposed upon it under this Contract and FIPPA, and shall take whatever steps are necessary to ensure that all of its Subcontractors comply with those obligations, including (but not limited to) binding said Subcontractors to terms no less strict than those herein through written confidentiality agreements.
- D8.9 The Contractor shall put into place reasonable security arrangements, including administrative, technical, and physical safeguards that ensure the confidentiality and security of the Confidential Information. The standard of such security arrangements shall be the greater of:
 - (a) the standards the Contractor has in place to protect its own confidential information; or
 - (b) the standards imposed on the Contractor by the Contract Administrator.
- D8.10 Upon becoming aware of any unauthorized use or handling of the Confidential Information (a "Confidentiality Breach"), the Contractor shall immediately notify the Contract Administrator in writing, take all reasonable steps to prevent the recurrence of any such Confidentiality Breach, and notify the Contract Administrator of said steps in writing.
- D8.11 Upon receiving a subpoena or other validly issued administrative or judicial order seeking Confidential Information, the Contractor shall provide the Contract Administrator with prompt notice thereof, deliver a copy of its proposed response to the Contract Administrator, and thereafter be entitled to comply with the demand to the extent permitted or required by law (unless the demand has been time-limited, quashed, or extended). The Contractor shall cooperate with the Contract Administrator in the defense of the demand, if so requested by the Contract Administrator.
- D8.12 The Contractor shall, and shall ensure its Subcontractors, comply with all directives issued by the Contract Administrator with respect to safeguarding or otherwise ensuring the confidentiality of the Confidential Information, and shall cooperate with the Contract Administrator so that the Contract Administrator can verify that the Contractor has complied, and is complying, with its obligations hereunder.

SUBMISSIONS

D9. AUTHORITY TO CARRY ON BUSINESS

- D9.1 The Contractor shall be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba, or if the Contractor does not carry on business in Manitoba, in the jurisdiction where the Contractor does carry on business, throughout the term of the Contract, and shall provide the Contract Administrator with evidence thereof upon request.

SCHEDULE OF WORK

D10. COMMENCEMENT

- D10.1 The Contractor shall not commence any Work until they are in receipt of a notice of award from the City authorizing the commencement of the Work.
- D10.2 The Contractor shall not commence any Work until:
 - (a) the Contract Administrator has confirmed receipt and approval of:
 - (i) evidence of authority to carry on business specified in D9;
 - (ii) evidence of the workers compensation coverage specified in C6.17;
 - (iii) the direct deposit application form specified in D16; and

- (b) the Contractor has attended a meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a meeting.

D11. DELIVERY

- D11.1 Goods shall be delivered within twenty-one (21) Business Days of the award of contract, f.o.b. destination, freight prepaid to:

Communication Systems Branch (Radio Shop)
421 Osborne Street
Winnipeg, MB Canada
R3L 2A2

- D11.2 Goods shall be delivered between 8:30 a.m. and 4:30 p.m. on Business Days.

- D11.3 The Contractor shall off-load goods as directed at the delivery location.

D12. LIQUIDATED DAMAGES

- D12.1 If the Contractor fails to achieve delivery of the goods within the time specified in D11.1 Delivery the Contractor shall pay the City two hundred dollars (\$200) per Calendar Day for each and every Calendar Day until the goods have been delivered.

- D12.2 The amount specified for liquidated damages in D12.1 is based on a genuine pre-estimate of the City's damages in the event that the Contractor does not achieve Delivery by the day fixed herein for same.

- D12.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

D13. SUPPLY CHAIN DISRUPTION SCHEDULE DELAYS

- D13.1 The City acknowledges that the schedule for this Contract may be impacted by Supply Chain Disruption. Commencement and progress of the Work shall be performed by the Contractor with due consideration to the delivery requirements and schedule identified in the Contract, in close consultation with the Contract Administrator.

- D13.2 If the Contractor is delayed in the performance of the Work by reason of Supply Chain Disruption, the Work schedule may be adjusted by a period of time equal to the time lost due to such delay and costs related to such delay will be determined as identified herein.

- D13.3 A minimum of seven (7) Calendar Days prior to the commencement of Work, the Contractor shall declare whether a Supply Chain Disruption will affect the start date. The Contractor shall provide sufficient evidence that the delay is directly related to a Supply Chain Disruption, including but not limited to evidence related to ordering of material or goods, production and/or manufacturing schedules or availability of staff as appropriate.

- D13.4 For any delay related to Supply Chain Disruption and identified after Work has commenced, the Contractor shall within seven (7) Calendar Days of becoming aware of the anticipated delay declare the additional delay and shall provide sufficient evidence as indicated in D13.3. Failure to provide this notice will result in no additional time delays being considered by the City.

- D13.5 The Work schedule, including the durations identified in D11 where applicable, will be adjusted to reflect delays accepted by the Contract Administrator.

- D13.6 Any time or cost implications as a result of Supply Chain Disruption and in accordance with the above, as confirmed by the Contract Administrator, shall be documented in accordance with C7.

D14. ORDERS

- D14.1 The Contractor shall provide a local Winnipeg telephone number or a toll-free telephone number at which orders for delivery may be placed.

D15. RECORDS

- D15.1 The Contractor shall keep detailed records of the goods supplied under the Contract.
- D15.2 The Contractor shall record, as a minimum, for each item listed on Form B: Prices:
- (a) user name(s) and addresses;
 - (b) order date(s);
 - (c) delivery date(s); and
 - (d) description and quantity of goods supplied.
- D15.3 The Contractor shall provide the Contract Administrator with a copy of the records for each quarter year within fifteen (15) Calendar Days of a request of the Contract Administrator.

MEASUREMENT AND PAYMENT

D16. INVOICES

- D16.1 Further to C10, the Contractor:
- (a) shall submit invoices for Work performed in accordance with the instruction on the City's website at: <https://www.winnipeg.ca/finance/corporate-accounts-payable.stm>; and
 - (b) should copy the Contract Administrator on submission of its invoice.

D17. PAYMENT

- D17.1 Further to C10, the City shall make payments to the Contractor by direct deposit to the Contractor's banking institution, and by no other means. Payments will not be made until the Contractor has made satisfactory direct deposit arrangements with the City. Direct deposit application forms are at https://legacy.winnipeg.ca/finance/files/Direct_Deposit_Form.pdf.

WARRANTY

D18. WARRANTY

- D18.1 Notwithstanding C11, the warranty period shall begin on the date of Total Performance and shall expire **TWO (2) years** thereafter unless extended pursuant to C11.3, in which case it shall expire when provided for thereunder.

DISPUTE RESOLUTION

D19. DISPUTE RESOLUTION

- D19.1 If the Contractor disagrees with any opinion, determination, or decision of the Contract Administrator, the Contractor shall act in accordance with the Contract Administrator's opinion, determination, or decision unless and until same is modified by the process followed by the parties pursuant to D19.
- D19.2 The entire text of C19.4 is deleted, and amended to read: "Intentionally Deleted"
- D19.3 The entire text of C19.5 is deleted, and amended to read:

- (a) If Legal Services has determined that the Disputed Matter may proceed in the Appeal Process, the Contractor must, within ten (10) Business Days of the date of the Legal Services Response Letter, submit their written Appeal Form, in the manner and format set out on the City's Purchasing Division Website, to the Chief Administrative Officer, and to the Contract Administrator. The Contractor may not raise any other disputes other than the Disputed Matter in their Appeal Form.
- D19.4 Further to C19, prior to the Contract Administrator's issuance of a Final Determination, the following informal dispute resolution process shall be followed where the Contractor disagrees with any opinion, determination, or decision of the Contract Administrator ("Dispute"):
- (a) In the event of a Dispute, attempts shall be made by the Contract Administrator and the Contractor's equivalent representative to resolve Disputes within the normal course of project dealings between the Contract Administrator and the Contractor's equivalent representative.
 - (b) Disputes which in the reasonable opinion of the Contract Administrator or the Contractor's equivalent representative cannot be resolved within the normal course of project dealings as described above shall be referred to a without prejudice escalating negotiation process consisting of, at a minimum, the position levels as shown below and the equivalent Contractor representative levels:
 - (i) The Contract Administrator;
 - (ii) Supervisory level between the Contract Administrator and applicable Department Head;
 - (iii) Department Head.
- D19.4.1 Names and positions of Contractor representatives equivalent to the above City position levels shall be determined by the Contractor and communicated to the City at the pre-commencement or kick off meeting.
- D19.4.2 As these negotiations are not an adjudicative hearing, neither party may have legal counsel present during the negotiations.
- D19.4.3 Both the City and the Contractor agree to make all reasonable efforts to conduct the above escalating negotiation process within twenty (20) Business Days, unless both parties agree, in writing, to extend that period of time.
- D19.4.4 If the Dispute is not resolved to the City and Contractor's mutual satisfaction after discussions have occurred at the final escalated level as described above, or the time period set out in D19.4.3, as extended if applicable, has elapsed, the Contract Administrator will issue a Final Determination as defined in C1.1(v), at which point the parties will be governed by the Dispute Resolution process set out in C19.

THIRD PARTY AGREEMENTS

D20. FUNDING AND/OR CONTRIBUTION AGREEMENT OBLIGATIONS

- D20.1 In the event that funding for the Work of the Contract is provided to the City of Winnipeg by the Government of Manitoba and/or the Government of Canada, the following terms and conditions shall apply, as required by the applicable funding agreements.
- D20.2 Further to D20.1, in the event that the obligations in D20 apply, actual costs legitimately incurred by the Contractor as a direct result of these obligations ("Funding Costs") shall be determined by the actual cost to the Contractor and not by the valuation method(s) outlined in C7.4. In all other respects Funding Costs will be processed in accordance with Changes in Work under C7.
- D20.3 For the purposes of D20:
- (a) **"Government of Canada"** includes the authorized officials, auditors, and representatives of the Government of Canada; and

- (b) **“Government of Manitoba”** includes the authorized officials, auditors, and representatives of the Government of Manitoba.

D20.4 Modified Insurance Requirements

- D20.4.1 Where applicable, the Contractor will be required to provide wrap-up liability insurance in an amount of no less than two million dollars (\$2,000,000) inclusive per occurrence. Such policy will be written in the joint names of the City, Contractor, Consultants and all subcontractors and subconsultants and include twelve (12) months completed operations. The Government of Manitoba and their Ministers, officers, employees, and agents shall be added as additional insureds.
- D20.4.2 If applicable the Contractor will be required to provide builders' risk insurance (including boiler and machinery insurance, as applicable) providing all risks coverage at full replacement cost, or such lower level of insurance that the City may identify on a case-by-case basis, such as an installation floater.
- D20.4.3 The Contractor shall obtain and maintain third party liability insurance with minimum coverage of two million dollars (\$2,000,000.00) per occurrence on all licensed vehicles operated at the Site. In the event that this requirement conflicts with another licensed vehicle insurance requirement in this Contract, then the requirement that provides the higher level of insurance shall apply.
- D20.4.4 Insurers shall provide satisfactory Certificates of Insurance to the Government of Manitoba prior to commencement of Work as written evidence of the insurance required. The Certificates of Insurance must provide for a minimum of thirty (30) days' prior written notice to the Government of Manitoba in case of insurance cancellation.
- D20.4.5 All policies must be taken out with insurers licensed to carry on business in the Province of Manitoba.

D20.5 Indemnification By Contractor

- D20.5.1 In addition to the indemnity obligations outlined in C15 of the General Conditions for Goods, the Contractor agrees to indemnify and save harmless the Government of Canada and the Government of Manitoba and each of their respective Ministers, officers, servants, employees, and agents from and against all claims and demands, losses, costs, damages, actions, suit or other proceedings brought or pursued in any manner in respect of any matter caused by the Contractor or arising from this Contract or the Work, or from the goods or services provided or required to be provided by the Contractor, except those resulting from the negligence of any of the Government of Canada's or the Government of Manitoba's Ministers, officers, servants, employees, or agents, as the case may be.
- D20.5.2 The Contractor agrees that in no event will Canada or Manitoba, their respective officers, servants, employees or agents be held liable for any damages in contract, tort (including negligence) or otherwise, for:
- (a) any injury to any person, including, but not limited to, death, economic loss or infringement of rights;
 - (b) any damage to or loss or destruction of property of any person; or
 - (c) any obligation of any person, including, but not limited to, any obligation arising from a loan, capital lease or other long term obligation;

in relation to this Contract or the Work.

D20.6 Records Retention and Audits

- D20.6.1 The Contractor shall maintain and preserve accurate and complete records in respect of this Contract and the Work, including all accounting records, financial documents, copies of contracts with other parties and other records relating to this Contract and the Work during the term of the Contract and for at least six (6) years after Total Performance. Those

records bearing original signatures or professional seals or stamps must be preserved in paper form; other records may be retained in electronic form.

- D20.6.2 In addition to the record keeping and inspection obligations outlined in C6 of the General Conditions for Goods, the Contractor shall keep available for inspection and audit at all reasonable times while this Contract is in effect and until at least six (6) years after Total Performance, all records, documents, and contracts referred to in D20.6.1 for inspection, copying and audit by the City of Winnipeg, the Government of Manitoba and/or the Government of Canada and their respective representatives and auditors, and to produce them on demand; to provide reasonable facilities for such inspections, copying and audits, to provide copies of and extracts from such records, documents, or contracts upon request by the City of Winnipeg, the Government of Manitoba, and/or the Government of Canada and their respective representatives and auditors, and to promptly provide such other information and explanations as may be reasonably requested by the City of Winnipeg, the Government of Manitoba, and/or the Government of Canada from time-to-time.

D20.7 Other Obligations

- D20.7.1 The Contractor consents to the City providing a copy of the Contract Documents to the Government of Manitoba and/or the Government of Canada upon request from either entity.
- D20.7.2 If the Lobbyists Registration Act (Manitoba) applies to the Contractor, the Contractor represents and warrants that it has filed a return and is registered and in full compliance with the obligations of that Act, and covenants that it will continue to comply for the duration of this Contract.
- D20.7.3 The Contractor shall comply with all applicable legislation and standards, whether federal, provincial, or municipal, including (without limitation) labour, environmental, and human rights laws, in the course of providing the Work.
- D20.7.4 The Contractor shall properly account for the Work provided under this Contract and payment received in this respect, prepared in accordance with generally accepted accounting principles in effect in Canada, including those principles and standards approved or recommended from time-to-time by the Chartered Professional Accountants of Canada or the Public Sector Accounting Board, as applicable, applied on a consistent basis.
- D20.7.5 The Contractor represents and warrants that no current or former public servant or public office holder, to whom the Value and Ethics Code for the Public Sector, the Policy on Conflict of Interest and Post Employment, or the Conflict of Interest Act applies, shall derive direct benefit from this Contract, including any employment, payments, or gifts, unless the provision or receipt of such benefits is in compliance with such codes and the legislation.
- D20.7.6 The Contractor represents and warrants that no member of the House of Commons or of the Senate of Canada or of the Legislative Assembly of Manitoba is a shareholder, director or officer of the Contractor or of a Subcontractor, and that no such member is entitled to any benefits arising from this Contract or from a contract with the Contractor or a Subcontractor concerning the Work.

ADJUSTMENTS FOR CHANGES IN LAWS, TAXES, OR TARIFFS

D21. ADJUSTMENTS FOR CHANGES IN LAWS, TAXES, OR TARIFFS

- D21.1 Further to C12.4 and subject to C6.13, the Contract Price shall be adjusted if any change in a law or tax imposed under the Excise Act, the Excise Tax Act, the Customs Act, the Customs Tariff, The Mining Tax Act (Manitoba), or The Retail Sales Tax Act (Manitoba), by an act of the Congress of the United States of America, or by Executive Order by the President of the United States under the International Emergency Economic Powers Act of the United States of America or similar legislation:

- (a) occurs after the Submission Deadline;
- (b) applies to Material; and
- (c) affects the cost of that Material to the Contractor.

D21.1.1 Further to C12.5, if a change referred to in C12.4 occurs, the Contract Price shall be increased or decreased by an amount equal to the amount that is established, by an examination of the relevant records of the Contractor, to be the increase or decrease in the cost incurred that is directly attributable to that change, and which the Contractor has proven to the Contract Administrator represents the minimum amount of increase necessary in order to obtain necessary Material or Plant. For the avoidance of doubt, the Contractor shall be required to provide satisfactory proof that it has investigated alternative options for obtaining equivalent Material or Plant and reducing or eliminating the increase in Contract Price, up to and including entering into purchase agreements with vendors located in other jurisdictions, in order for Contractor to be able to avail itself of the increase in Contract Price permitted.

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS

- E1.1 These Specifications shall apply to the Work.
- E1.2 Bidders are reminded that requests for approval of substitutes as an approved equal or an approved alternative shall be made in accordance with B6. In every instance where a brand name or design specification is used, the City will also consider approved equals and/or approved alternatives in accordance with B6.

E2. GOODS

- E2.1 The Contractor shall supply a Pulsed RF Microwave Frequency Counter/Analyzer in accordance with the requirements hereinafter specified.
- E2.2 Pulsed RF Microwave Frequency Counter/Analyzer (New) shall be provided to meet the specifications given below.

E2.2.1 Mandatory Requirements

- a) Shall support measurement, analysis and calibration of Microwave Frequency, Power, and Pulsed RF time parameters like pulse width and PRI.
- b) Measuring Functions – Frequency A, B, C:
 - i. Range:
 - a. Input A, B: 0.002 Hz to 400 MHz
 - b. Input C: 300 MHz to 27, 40, 46 or 60 GHz
 - ii. Resolution: 12 digits in 1s measuring time
 - iii. Acquisition C: Auto or Manual
 - a. Acquisition time: 25 ms in Auto (typ.)
 - iv. Aux. Parameters:
 - a. Input A, B: Vmax, Vmin, Vp-p
 - b. Input C: Power C in dBm or W Shall support calibration and test on Doppler Radar
- c) Measuring Functions – Frequency Burst A, B:
 - i. Range:
 - a. Input A, B: 0.002 Hz to 400 MHz
 - b. Input C: Requires option 28 - see "Pulsed RF" specs
 - ii. Minimum Burst Duration: Down to 40 ns
 - iii. Minimum Pulses in Burst:
 - a. Input A or B: 3 (6 above 160 MHz)
 - iv. PRF Range: 0.5 Hz to 1MHz
 - v. Start Delay: 10 ns to 2sec., 10 ns resolution
 - vi. Aux. Parameter: PRF
- d) Measuring Functions – Period A, B (single or average), C (average):
 - i. Mode: Single, Average
 - ii. Range:
 - a. Input A, B: 2.5 ns to 1000 s
 - b. Input C: 3.3 ns down to 37, 25, 22 or 17 ps

- iii. Resolution: 100 ps (single); 12 digits/s (avg)
- iv. Acquisition C: Auto or Manual
 - a. Acquisition time: 25 ms in Auto (typ.)
- v. Aux. Parameters: See Freq. A, B, or C measurements
- e) Measuring Functions – Ratio A/B, B/A, C/A, C/B
 - i. Range: (10^{-9}) to 10^{11}
 - ii. Input Frequency:
 - a. Input A, B: 0.1 Hz to 300 MHz
 - b. Input C: 300 MHz to 27, 40, 46 or 60 GHz
 - iii. Aux Parameters: Freq 1, Freq 2
- f) Measuring Functions – Time Interval A to B, B to A, A to A, B to B
 - i. Range:
 - a. Normal Calculation: 0ns to +106 sec.
 - b. Smart Calculation: -106 sec. to +106 sec.
 - ii. Resolution: 100 ps
 - iii. Min. Pulse Width: 1.6 ns
 - iv. Smart Calculation: Smart Time Interval to determine sign (A before B or A after B)
- g) Measuring Functions – Positive and Negative Pulse Width A, B
 - i. Range: 2.3 ns to 106 sec.
 - ii. Min. Pulse Width: 2.3 ns
 - iii. Aux. Parameters: Vmax, Vmin, Vp-p
- h) Measuring Functions – Rise and Fall Time A, B
 - i. Range: 1.5 ns to 106 sec.
 - ii. Trigger Levels: 10% and 90% of signal Vp-p
 - iii. Min. Pulse Width: 1.6 ns
 - iv. Aux. Parameters: Slew rate, Vmax, Vmin
- i) Measuring Functions – Positive and Negative Duty Factor A, B
 - i. Range: 0.000001 to 0.999999
 - ii. Freq. Range: 0.1 Hz to 300 MHz
 - iii. Aux. parameters: Period, pulse width
- j) Measuring Functions – Phase A Relative B, B Relative A
 - i. Range: -180° to $+360^{\circ}$
 - ii. Resolution: Single-cycle: 0.001° to 10 kHz, decreasing to 1° >10 MHz. Resolution can be improved via averaging (statistics)
 - iii. Freq. Range: up to 160 MHz
 - iv. Aux. Parameters: Freq (A), Va/Vb (in dB)
- k) Measuring Functions – Vmax, Vmin, Vp-p A, B
 - i. Range: -50 V to +50 V, -5V to +5V. Range is limited by the specification for max input voltage without damage (see input A, B)
 - ii. Freq. Range: DC, 1Hz to 300 MHz
 - iii. Mode: Vmax, Vmin, Vp-p
 - iv. Resolution: 2.5 mV
 - v. Uncertainty (5V range, typical):
 - a. DC, 1Hz to 1kHz: 1% +15 mV
 - b. 1kHz to 20 MHz: 3% +15 mV

- c. 20 to 100 MHz: 10% +15 mV
- d. 100 to 300 MHz: 30% +15 mV
- vi. Aux parameters: Vmin, Vmax, Vp-p
- l) Measuring Functions – Time Stamping A, B, C: Raw time stamp data together with pulse counts on inputs A, B or C, accessible via GPIB or USB only.
 - i. Max Sample Speed: See GPIB specifications
 - ii. Max Frequency: 160 MHz
 - iii. Timestamp Resolution: 70 ps
- m) Measuring Functions – Power C
 - i. Range:
 - a. Power: -35 dBm to +10 dBm
 - b. Frequency: 300 MHz to 27, 40, 46 or 60 GHz
 - ii. Display units: dBm (default) or W
 - iii. Resolution: 0.01 dBm @100 ms measuring time
 - iv. Accuracy (typ.): <1dBm to 27 GHz; <2dBm to 40 GHz; <3dBm to 60 GHz
 - v. Acquisition: Auto or Manual (within ± 40 MHz). Acquisition time: 20 to 30 ms in Auto (typ.)
 - vi. Aux .Parameters: Frequency C
- n) Pulsed RF parameters:
 - i. Pulse ON voltage range:
 - a. 0.4 to 40 GHz: -15 dBm to +13 dBm
 - b. (-20 dBm typ. to +13 dBm)
 - c. 40 to 46 GHz: -10 dBm (typ.) to +13 dBm
 - d. 46 to 60 GHz: 0 dBm (typ.) to +10 dBm
 - ii. Min ON/OFF ratio: 15 dB
 - iii. Pulse Width
 - a. Range: 30 ns to 1 sec.
 - b. Resolution: 200 ps rms
 - c. Accuracy: $<10 \text{ ns} + \text{TBE} * \text{P_width}$
 - iv. PRI (pulse repetition interval)
 - a. Range: 60 ns to 1 sec.
 - b. Resolution: 200 ps rms
 - c. Accuracy: $<2 \text{ ns} + \text{TBE} * \text{PRI}$ Shall support calibration and test on RF and microwave instrumentation calibration
 - v. PRF (pulse repetition frequency)
 - a. Range: 1 Hz to 16.7 MHz (20 MHz typ.)
 - b. Resolution: $(200\text{ps}/\text{Meas_time}) * \text{PRF Hz}$
 - vi. Frequency in Burst
 - a. Range: 400 MHz to 60 GHz
 - b. Pulse width: down to 100 ns
 - c. Resolution: $(50\text{ps}/\sqrt{N}/\text{Gate_time}) * \text{FREQ Hz}$
 - d. Acquisition: Manual
 - vii. Peak Power in Burst
 - a. Range: - 20dBm to +10 dBm
 - b. Pulse width: down to 50 us

c.Acquisition: Manual

d.Resolution:

1. 0.1 dBm < 1ms pulse
2. 0.01 dBm>1ms pulse

o) Input and Output Specifications: Inputs A and B

- i. Frequency Range
 - a.DC-Coupled: DC to 400 MHz
 - b.AC-Coupled: 10 Hz to 400 MHz
- ii. Impedance: 1M Ω // 20 pF or 50 Ω (VSWR $\leq$ 2:1)
- iii. Trigger Slope: Positive or negative
- iv. Max. Channel Timing Difference: 500 ps
- v. Sensitivity:
 - a.DC-200 MHz: 15 mVrms
 - b.200-300 MHz: 25 mVrms
 - c.300-400 MHz: 35 mVrms
- vi. Attenuation: x1, x10
- vii. Dynamic Range (x1): 30 mVp-p to 10 Vp-p within $\pm$ 5V window
- viii. Trigger Level: Read-Out on display
 - a.Resolution: 3mV
 - b.Uncertainty (x1): $\pm$ (15 mV + 1% of trigger level)
 - c.AUTO Trigger Level: Automatically set to 50% point of input signal (10% and 90% for Rise Fall Time)
- ix. AUTO Hysteresis:
 - a.Freq. range: 1Hz to 300 MHz
 - b.Time: Min hysteresis window (hysteresis compensation)
 - c.Frequency: 40% of input signal amplitude (typ.)
- x. Analog LP Filter: Nominal 100 kHz, RC-type.
- xi. Digital LP Filter: 1Hz to 50 MHz cut-off frequency
- xii. Max Voltage Without Damage: 1M: 350 V (DC + AC pk) to 440 Hz, falling to 12 Vrms at 1MHz; 50 Ω : 12 Vrms
- xiii. Connector: BNC

p) Input and Output Specifications: Input C

- i. Frequency Range: 0.3 to 27, 40, 46, 60 GHz depending on model
- ii. Operating input voltage range:
 - a.0.3 to 18 GHz: -33 to +13 dBm
 - b.18 to 20 GHz: -29 to +13 dBm
 - c.20 to 27 GHz: -27 to +13 dBm
 - d.27 to 40 GHz: -23 to +13 dBm
 - e.40 to 46 GHz: -17 to +13 dBm
 - f. 46 to 60 GHz: -15 to +10 dBm
- iii. Impedance: 50 Ω nominal, AC coupled
- iv. VSWR:
 - a.0.3 to 27 GHz: <2.0:1 (typ.)

- b. 27 to 46 GHz: <2.5:1 (typ.)
 - c. 46 to 60 GHz: <3.0:1 (typ.)
 - v. FM tolerance:
 - a. Manual acq.: 50 MHz p-p; freq C >3.5 GHz
 - b. 30 MHz p-p; freq C <3.5 GHz
 - c. Auto acq.: 20 MHz p-p; for any freq C and
 - d. modulation frequency > 0.1 MHz
 - vi. AM tolerance: Any modulation index (minimum signal must be within sensitivity range)
 - vii. Automatic Amplitude Discrimination: 10 dB separation between 2 signals within 30 MHz, 20 dB otherwise
 - viii. Max Voltage Without Damage: +25 dBm
 - ix. Overload indication: ON when input C power >+10 dBm
 - x. Connector:
 - a. 27 and 40 GHz: 2.92 mm sparkplug female
 - b. 46 and 60 GHz: 1.85 mm sparkplug female (all connectors are field replaceable)
- q) Input and Output Specifications - Rear Panel Inputs and Outputs
 - i. Reference Input: 1, 5, or 10 MHz; 0.1 to 5Vrms sine; impedance $\geq 1k\Omega$
 - ii. Reference Output: 10 MHz; >1Vrms sine into 50Ω
 - iii. Arming Input:
 - a. Arming of all measuring functions
 - b. Impedance: Approx. $1k\Omega$
 - c. Freq. Range: DC to 80 MHz
 - iv. Connector: BNC
- r) Other Measuring Functions
 - i. Trigger Hold-Off: Time Delay Range: 20 ns to 2sec., 10 ns resolution
 - ii. External Start and Stop Arming
 - a. Modes: Start and Stop Arming
 - b. Input Channels: A, B or E (Ext. Arming input)
 - c. Max Rep. Rate for Arming Signal:
 - 1. Channel A, B: 160 MHz
 - 2. Channel E: 80 MHz
 - d. Start Time Delay Range: 20 ns to 2sec., 10 ns resolution
 - iii. Statistics
 - a. Functions: Maximum, Minimum, Δ Max-Min, Mean, Standard Deviation and Allan Deviation
 - b. Display: Numeric, histograms or trend plots
 - c. Sample Size: 2 to 2×10^9 samples
 - d. Limit Qualifier: OFF or Capture values above/ below/inside or outside limits
 - e. Measurement Pacing: 4s to 500 sec.
 - iv. Mathematics
 - a. Functions: $(K \cdot X + L)/M$, $(K/X + L)/M$ or $X/M - 1$. X is current reading and K, L and M are constants; set via keyboard or as frozen reference value (X_0)
 - v. Other Functions

- a. Measuring Time: 20 ns to 1000 s for Frequency, Burst, PRF, Period Average and Power. Single cycle for other measuring functions
- b. Timebase Reference: Internal, External or Automatic
- c. Display Hold: Freezes result, until a new measurement is initiated via Restart
- d. Limit Alarm: Graphical indication on front panel and/or SRQ via GPIB.
 - i. Limit Values: Lower limit, Upper limit.
 - ii. Settings: OFF or Alarm if value is above/below/ inside or outside limits
 - iii. On Alarm: STOP or CONTINUE
 - iv. Display: Numeric + Graphic
- e. Stored Instrument Set-ups: 20 instrument setups can be saved/recalled from internal non-volatile memory. 10 can be user protected.
- f. Result Storage: Up to 8 measurements of max 32k samples can be stored in local memory for later downloading.
- g. Display: Backlit LCD Graphics screen for menu control, numerical read-out and status information.
 - i. Number of Digits: 14 digits in numerical mode
 - ii. Resolution: 320*97 pixels
- vi. GPIB Interface
 - a. Compatibility: IEEE 488.2-1987, SCPI 1999 or 53131A/53132A compatibility mode
 - b. Interface Functions: SH1, AH1, T6, L4, SR1, RL1, DC1, DT1, E2
 - c. Max. Measurement Rate:
 - 1. GPIB: 5k readings/s (block mode) 500 readings/s (individual GET trig'ed)
 - d. To Internal Memory: 250k readings/s
 - e. Internal Memory Size: Up to 750k readings.
- vii. USB Interface
 - a. USB Version: 2.0 Full speed (11 Mbits/s) Other
- s) Calibration
 - i. Mode: Closed case, menu controlled
 - ii. Cal. Frequencies: 0.1, 1, 5, 10, 1.544 and 2.048 MHz
- t) General Specifications – Environmental Data
 - i. Class: MIL-PRF-28800F, Class 3
 - ii. Installation category: II
 - iii. Operating Temp: 0 °C to +50 °C bench top; 0 °C to +40 °C rack mounted
 - iv. Storage Temp: -40 °C to +71 °C
 - v. Humidity: 5%-95% (10 °C to 30 °C). 5%-75% (30 °C to 40 °C). 5%-45% (40 °C to 50 °C)
 - vi. Altitude: 4 600 m
 - vii. Vibration: Random and sinusoidal according to MIL-PRF-28800F, Class 3
 - viii. Shock: Half-sine 30G per MIL-PRF-28800F Bench handling
 - ix. Transit drop test: According to MIL-PRF-28800F
 - x. Safety: EN 61010-1, pollution degree 2, meas cat I, CSA C22.2 No 1010-1, CE. Indoor use only
 - xi. EMC: EN 61326 (1997); A1 (1998), increased test levels according to EN 50082-2, Group 1, Class B, CE

- xii. Mains power: 100-240 Vac, 50-400 Hz (Nom.), <40 W, <60 W if battery option
- u) General Specifications – Dimensions and Weight
 - i. Width x Height x Depth: 210x90x395 mm (8.25x3.6x15.6 in)
 - ii. Weight: Net 2.7 kg (5.8 lb), Shipping app. 3.5 kg (app. 7.5 lb)