

IMPORTANT NOTICE

The U.S. Postal Service continues to irradiate letters, flats, Express and Priority Mail with stamps for postage and other packages with stamps for postage destined to government agencies in the ZIP Code ranges 202 through 205.

Mail that is irradiated may exhibit a discolored (tan-colored) quality, as well as be brittle, show spots on envelopes and make address labels unreadable. Irradiation may destroy electronic format materials provided on computer discs. Customers and businesses sending mail to ZIP Codes 202-205 can avoid the irradiation process by affixing postage meter strips or permit indicia instead of postage stamps to Express or Priority Mail. The use of corporate accounts for Express Mail or registered mail also is another way to avoid the irradiation process.

Due to potential delays in receiving mail and potential for receipt of damaged computer discs, offerors are encouraged to use alternatives to the mail when submitting proposals.

This solicitation contains the provision at FAR 52.215-5 which authorizes facsimile proposals. Offerors are encouraged to use alternatives to the mail when submitting proposals.

SOLICITATION, OFFER AND AWARD

1. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 350)

RATING

DO-C9

PAGE OF

1 | 24 PAGES

2. CONTRACT NO. _____ 3. SOLICITATION NO. **N00173-02-R-CB04**

4. TYPE OF SOLICITATION
 SEALED BID (IFB)
 NEGOTIATED (RFP)

5. DATE ISSUED **05 Aug 2002**

6. REQUISITION/PURCHASE NO. _____

7. ISSUED BY
 CONTRACTING OFFICER
 NAVAL RESEARCH LABORATORY
 ATTN: CODE 3230.CB
 WASHINGTON DC 20375-5326

8. ADDRESS OFFER TO (If other than Item 7)
 CODE **N00173**

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".

SOLICITATION

9. Sealed offers in original and _____ copies for furnishing the supplies or services in the Schedule will be received at the place specified in Item 8, or if handcarried, in the depository located in **See Section L-2** until **3:00** local time **06 Sep 2002**
 (Hour) (Date)

CAUTION - LATE Submissions, Modifications, and Withdrawals: See Section L, Provision No. 52.214-7 or 52.215-10. All offers are subject to all terms and conditions contained in this solicitation.

10. FOR INFORMATION CALL: **Cheri Burkhardt** A. NAME B. TELEPHONE NO. (Include area code) (NO COLLECT CALLS) **(202)767-6542**

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OFFER (Must be fully completed by offeror)

NOTE: Item 12 does not apply if the solicitation includes the provisions at 52.214-16, Minimum Bid Acceptance Period.

12. In compliance with the above, the undersigned agrees, if this offer is accepted within _____ calendar days (60 calendar days unless a different period is inserted by the offeror) from the date for receipt of offers specified above, to furnish any or all items upon which prices are offered at the price set opposite each item, delivered at the designated point(s), within the time specified in the schedule.

13. DISCOUNT FOR PROMPT PAYMENT (See Section I, Clause No. 52-232-8)

10 CALENDAR DAYS	20 CALENDAR DAYS	30 CALENDAR DAYS	CALENDAR DAYS
%	%	%	%

14. ACKNOWLEDGMENT OF AMENDMENTS (The offeror acknowledges receipt of amendments to the SOLICITATION for offerors and related documents numbered and dated:

AMENDMENT NO.	DATE	AMENDMENT NO.	DATE

15A. NAME AND ADDRESS OF OFFEROR CODE _____ FACILITY _____

16. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER (Type or print)

15B. TELEPHONE NO. (Include area code) _____

15C. CHECK IF REMITTANCE ADDRESS IS DIFFERENT FROM ABOVE - ENTER SUCH ADDRESS IN SCHEDULE.

17. SIGNATURE _____ 18. OFFER DATE _____

AWARD (To be completed by Government)

19. ACCEPTED AS TO ITEMS NUMBERED _____ 20. AMOUNT _____

21. ACCOUNTING AND APPROPRIATION _____

22. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION:
 10 U.S.C. 2304(c) () 41 U.S.C. 253(c) ()

23. SUBMIT INVOICES TO ADDRESS SHOWN IN (4 copies unless otherwise specified) **ITEM**

24. ADMINISTERED BY (If other than Item 7) CODE _____

25. PAYMENT WILL BE MADE BY _____ CODE _____

26. NAME OF CONTRACTING OFFICER (Type or print) _____

27. UNITED STATES OF AMERICA _____
 (Signature of Contracting Officer)

28. AWARD DATE _____

IMPORTANT - Award will be made on this Form, or on Standard Form 26, or by other authorized official written notice.

PART I - THE SCHEDULE
SECTION B
SUPPLIES OR SERVICES AND PRICES/COSTS

B-1 SUPPLIES OR SERVICES AND PRICES/COSTS

ITEM NUMBER	SUPPLIES OR SERVICES	QTY	UNIT	UNIT PRICE	AMOUNT
0001	Shielded Anechoic Chamber/RF Test Facility and warranty/remedial maintenance in accordance with Section C and Attachment No. 1, Statement of Work	1	LO	\$	\$
0002	The contractor shall provide training in accordance with Section C and Attachment No. 1, Statement of Work, Paragraph 7.1	1	LO	\$	\$
0003	The contractor shall provide an independent tester for chamber performance test in accordance with Section C and Attachment No. 1, Statement of Work, Paragraph 6.3.8.	1	LO	\$	\$
0004	Reports and Data in accordance with Exhibit A (DD1423)	1	LO	*NSP	*NSP
OPTION 1					
0005	Recessed Equipment Pit in accordance with Section C and Attachment No. 1, Statement of Work, Paragraph 8.2	1	LO	\$	\$
OPTION 2					
0006	Network Analyzer Equipment in accordance with Section C and Attachment No. 1, Statement of Work, Paragraph 8.3	1	LO	\$	\$

OPTION 3

0007	Chamber Construction Technique in accordance with Section C and Attachment No 1, Statement of Work, Paragraph 8.1	1	LO	\$	\$
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TOTAL DOLLAR AMOUNT FOR CLINs, If exercised*:	\$
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*CONTRACT LINE ITEM NUMBER

*Not Separately Priced

SECTION C
DESCRIPTION/SPECIFICATIONS/STATEMENT OF WORK

C-1 Items furnished under this contract shall comply with Attachment (1), Statement of Work with Exhibit A, DD Form 1423, Contracts Data Requirements List, and all other Attachments cited in Section J, which are incorporated by reference into Section C.

C-2 REQUIREMENTS FOR ON-SITE CONTRACTORS

For those portions of the work under this contract performed at any NRL site, the contractor shall comply with the Requirements for On-Site Contractors dated 19 October 2001 which are hereby incorporated by reference. The full text is available at <http://heron.nrl.navy.mil/contracts/home.htm>.

SECTION D
PACKAGING AND MARKING

D-1 Preservation, packaging, packing and marking of all deliverable contract line items must conform to normal commercial packing standards to assure safe delivery at destination.

D-2 The Contractor shall mark all shipments under this contract in accordance with the edition of ASTM-D-3951-90 "Standard Practice for Commercial Packaging" in effect on the date of the contract.

**SECTION E
INSPECTION AND ACCEPTANCE**

E-1 INSPECTION AND ACCEPTANCE CLAUSES BY REFERENCE:

FAR CLAUSE TITLE

- 52.246-2 - Inspection Of Supplies - Fixed -Price (AUG 1996)
- 52.246-4 - Inspection Of Services - Fixed Price (AUG 1996)
- 52.246-16 - Responsibility For Supplies (APR 1984)

DFARS CLAUSE TITLE

- 252.246-7000 - Material Inspection And Receiving Report (DEC 1991)

E-2 INSPECTION AND ACCEPTANCE

Inspection and acceptance of the final delivery will be accomplished by the Technical Manager (TM) or Contracting Officer Representative (COR) designated in Section G of this contract . Inspection and acceptance will be performed at the Naval Research Laboratory, Washington DC 20375-5320.

**SECTION F
DELIVERIES OR PERFORMANCE**

F-1 DELIVERIES OR PERFORMANCE CLAUSES BY REFERENCE:

FAR CLAUSE TITLE

- 52.211-17 - Delivery Of Excess Quantities (SEP 1989)
- 52.242-15 - Stop-Work Order (AUG 1989)
- 52.242-17 - Government Delay Of Work (APR 1984)
- 52.247-34 - F.O.B. Destination (NOV 1991)

F-2 FAR 52.211-8 - TIME OF DELIVERY (JUN 1997)

(a) The Government requires delivery to be made according to the following schedule:

REQUIRED DELIVERY SCHEDULE		
<i>[Contracting Officer insert specific details]</i>		
Item No.	Quantity	Within Days After Date Of Contract
0001	1	240 DAYS
0002	1	240 DAYS
0004	1	240 DAYS
OPTION		
0006	1	240 DAYS
0007	1	240 DAYS
0008	1	240 DAYS

F-3 DELIVERIES OR PERFORMANCE

(b) The principal place of performance of this contract shall be contractor's facility

F-4 PLACE OF DELIVERY - FOB DESTINATION

The contractor shall deliver supplies, all transportation charges paid, to destination in accordance with the clause in Section F of the Schedule titled FAR 52.247-34 FOB Destination (NOV 1991).

Receiving Officer
 Naval Research Laboratory
 Contract Number
 ATTN: *
 CODE: *
 LOCATION: *
 Bldg. 49
 4555 Overlook Avenue, SW
 Washington DC 20375-5320

(* To be filled in at time of award.)

SECTION G
CONTRACT ADMINISTRATION DATA

G-1 PROCURING OFFICE REPRESENTATIVE

In order to expedite administration of the contract, the Administrative Contracting Officer (ACO) will direct inquiries to the appropriate office listed below. Please do not direct routine inquiries to the person listed in Item 20A on Standard Form 26.

Contract Matters- *

Security Matters- *

Safety Matters- *

Patent Matters- *

Release of Data- *

The ACO will forward invention disclosures and reports directly to the Associate Counsel for Patents, Code 1008.2, Naval Research Laboratory, Washington DC 20375-5320. The Associate Counsel for Patents will return the reports along with a recommendation to the Administrative Contracting Officer. The Associate Counsel for Patents will represent the Contracting Officer with regard to invention reporting matters arising under this contract.

(* To be filled in at time of award)

In order to expedite administration of the contract, the Administrative Contracting Officer (ACO) will direct inquiries to the

G-2 TECHNICAL DIRECTION MEMORANDUM (TDM)

- (a) For the purposes of this clause, technical direction includes the following:
- (1) Direction to the Contractor which shifts work emphasis between work areas or tasks, requires pursuit of certain lines of inquiry, fills in details or otherwise describes work which will accomplish the objectives described in the statement of work;
 - (2) Guidelines to the Contractor which assist in interpretation of drawings, specifications or technical portions of work description.
- (b) Technical instructions must be within the scope of work stated in the contract. Technical instructions may not be used to:
- (1) Assign additional work under the contract;
 - (2) Direct a change as defined in the contract clause entitled "Changes";
 - (3) Increase or decrease the estimated contract cost, the fixed fee, or the time required for contract performance; or
 - (4) Change any of the terms, conditions or specifications of the contract

- (c) The TDM shall be written by the Contracting Officer's Representative (COR), with the original given to the Contractor and a copy retained in the CORs file. Technical direction may be issued orally only in emergency situations. If technical direction is issued orally, a TDM must follow within two (2) working days from the date of the oral direction. Amendments, corrections, or changes to TDMs shall also be in written format and shall include all the information set forth in paragraph (e) below.
- (d) A TDM shall be considered issued when the Government deposits it in the mail, or if transmitted by other means, when it is physically delivered to the contractor.
- (e) TDMs shall include, but not be limited to, the following information:
- (1) Date of TDM,
 - (2) Contract Number,
 - (3) Reference to the relevant portion or item in the Statement of Work,
 - (4) The specific technical direction or clarification, and
 - (5) The signature of the COR.
- (f) CORs shall retain all files containing TDMs for a period of two (2) years after the final contract completion date.
- (g) The only individual authorized in any way to amend or modify any of the terms of this contract shall be the Contracting Officer. When, in the opinion of the Contractor, any technical direction calls for effort outside the scope of the contract or inconsistent with this special provision, the Contractor shall notify the Contracting Officer in writing within ten (10) working days after its receipt.

G-3 TECHNICAL MANAGER - FUNCTIONS AND LIMITATIONS

* is hereby designated the cognizant Technical Manager who will represent the Contracting Officer in the administration of technical details within the scope of this contract and inspection and acceptance. The Technical Manager is not otherwise authorized to make any representations or commitments of any kind on behalf of the Contracting Officer or the Government. The Technical Manager does not have the authority to alter the Contractor's obligations or change the specifications in the contract. If, as a result of technical discussions, it is desirable to alter contract obligations or statements of work, a modification must be issued in writing and signed by the Contracting Officer. The Technical Manager, after review and signature of the "Material Inspection and Receiving Report, DD Form 250, If applicable, will forward a copy to the Administrative Contracting Officer.

(* To be filled in at time of award)

G-4 SUBCONTRACTORS/CONSULTANTS

- (a) Advance notification or requests for consent pursuant to the contract clause entitled "Subcontracts" (FAR 52.244-2) shall be directed to the cognizant administrative contracting officer (ACO).
- (b) The following subcontractors/consultants have been identified in the Contractor's proposal as necessary for performance of this contract:

Subcontractor/Consultant Name	Estimated Cost
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(Paragraph (b) will be included and filled in at time of award if subcontractor/consultants are proposed by the successful offeror)

G-5 NAPS 5252.232-9000 - SUBMISSION OF INVOICES (FIXED PRICE) (JUL 1992)

- (a) "Invoices" as used in this clause does not include contractor's requests for progress payments.
- (b) The contractor shall submit original invoices with 4 copies to the address identified in the solicitation/contract award form (SF 26-Block 10; SF 33-Block 23; SF 1447-Block 14), unless delivery orders are applicable, in which case invoices will be segregated by individual order and submitted to the address specified in the order (DD 1155-Block 13 or SF 26-Block 10).
- (c) The use of copies of the Material Inspection and Receiving Report (MIRR), DD Form 250, as an invoice is encouraged. DFARS Appendix F-306 provides instructions for such use. Copies of the MIRR used as an invoice are in addition to the standard distribution stated in DFARS F-401.
- (d) In addition to the requirements of the Prompt Payment clause of this contract, the contractor shall cite on each invoice the contract line item number (CLIN); the contract subline item number (SLIN), if applicable; the accounting classification reference number (ACRN) as identified on the financial accounting data sheets, and the payment terms.
- (e) The contractor shall prepare:
- a separate invoice for each activity designated to receive the supplies or services.
 - a consolidated invoice covering all shipments delivered under an individual order.
 - either of the above.
- (f) If acceptance is at origin, the contractor shall submit the MIRR or other acceptance verification directly to the designated payment office. If acceptance is at destination, the consignee will forward acceptance verification to the designated payment office.

G-6 INVOICING ADDRESS

With reference to paragraph (b) of the above provision, "Submission of Invoices(Fixed Price)", the contractor shall submit invoices to the address in Block 12 of the contract award form (SF26).

**SECTION H
SPECIAL CONTRACT REQUIREMENTS**

H-1 TYPE OF CONTRACT

(To be filled in at time of award)

H-2 REPRESENTATIONS AND CERTIFICATIONS

The Contractor's completed Representations, Certifications, and Other Statements of Offerors or Respondents is incorporated herein by reference in any resultant award.

H-3 OPTION(S)

The Government may require delivery of the optional items under this contract by the Contracting Officer's exercising options 1,2 and 3 at time of award.

H-4 ELECTRONIC AND INFORMATION TECHNOLOGY (EIT)

In accordance with Section 508 of the Rehabilitation Act of 1973 (29 U.S.C. 794d), all EIT supplies and services provided under this contract must comply with the applicable accessibility standards issued by the Architectural and Transportation Barriers Compliance Board at 36 CFR part 1194 (see FAR Subpart 39.2). Electronic and information technology (EIT) is defined at FAR 2.101.

H-5 SUBCONTRACTING PLAN

The contractor's Comprehensive Small Business Subcontracting Plan is incorporated into this contract in accordance with DFARS SUBPART 219.7 *Test Program for Negotiation of Comprehensive Small Business Subcontracting Plans*.

H-5 CHAMBER PERFORMANCE TEST (INDEPENDENT TESTER) – SOW PARAGRAPH 6.3.8

The contractor shall notify the TM of the test schedule seven (7) days in advance of the test. NRL personnel will be observing the entire test at NRL.

PART II - CONTRACT CLAUSES
SECTION I
CONTRACT CLAUSES

I-1 52.252-2 - CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available.

Also, the full text of a clause may be accessed electronically at this/these address(es):

<http://www.arnet.gov/far>

<http://heron.nrl.navy.mil/contracts/home.htm>

a. FEDERAL ACQUISITION REGULATION CLAUSES

FAR CLAUSE TITLE

- 52.202-1 - Definitions (DEC 2001)
- 52.203-3 - Gratuities (APR 1984)
- 52.203-5 - Covenant Against Contingent Fees (APR 1984)
- 52.203-6 - Restrictions On Subcontractor Sales To The Government (JUL 1995)
- 52.203-7 - Anti-Kickback Procedures (JUL 1995)
- 52.203-8 - Cancellation, Rescission, And Recovery Of Funds For Illegal Or Improper Activity (JAN 1997)
- 52.203-10 - Price Or Fee Adjustment For Illegal Or Improper Activity (JAN 1997)
- 52.203-12 - Limitation On Payments To Influence Certain Federal Transactions (JUN 1997)
- 52.204-4 - Printed Or Copied Double-Sided On Recycled Paper (AUG 2000)
- 52.209-6 - Protecting The Government's Interest When Subcontracting With Contractors Debarred, Suspended, Or Proposed For Debarment (JUL 1995)
- 52.211-5 - Material Requirements (AUG 2000)
- 52.211-15 - Defense Priority And Allocation Requirements (SEP 1990)
- 52.215-2 - Audit And Records-Negotiation (JUN 1999)
- 52.215-8 - Order Of Precedence - Uniform Contract Format (OCT 1997)
- 52.215-14 - Integrity Of Unit Prices (OCT 1997)
- 52.215-17 - Waiver Of Facilities Capital Cost Of Money(OCT 1997) (*will be included if the successful offeror does not propose facilities capital cost of money*)
- 52.215-21 - Requirements For Cost Or Pricing Data Or Information Other Than Cost Or Pricing Data -Modifications (OCT 1997)
- 52.219-4 - Notice Of Price Evaluation Preference For HUBZone Small Business Concerns (JAN 1999) Offeror elects to waive the evaluation preference.
- 52.219-8 - Utilization Of Small Business Concerns (OCT 2000)
- 52.219-9 - Small Business Subcontracting Plan (JAN 2002)
- 52.219-16 - Liquidated Damages - Subcontracting Plan (JAN 1999)
- 52.222-3 - Convict Labor (AUG 1996)
- 52.222-19 - Child Labor – Cooperation With Authorities And Remedies (DEC 2001)
- 52.222-20 - Walsh-Healey Public Contracts Act (DEC 1996)

- 52.222-21 - Prohibition of Segregated Facilities (FEB 1999)
- 52.222-26 - Equal Opportunity (APR 2002)
- 52.222-35 - Equal Opportunity For Special Disabled Veterans, Veterans Of The Vietnam Era, And Other Eligible Veterans (DEC 2001)
- 52.222-36 - Affirmative Action For Workers With Disabilities (JUN 1998)
- 52.222-37 - Employment Reports On Special Disabled Veterans, Veterans Of The Vietnam Era, And Other Eligible Veterans (DEC 2001)
- 52.223-3 - Hazardous Material Identification And Material Safety Data (JAN 1997)
- 52.223-5 - Pollution Prevention and Right-To-Know Information (APR 1998)
- 52.223-6 - Drug-Free Workplace (MAY 2001)
- 52.223-10 - Waste Reduction Program (AUG 2000)
- 52.223-14 - Toxic Chemical Release Reporting (OCT 2000)
- 52.225-13 - Restrictions On Certain Foreign Purchases (JUL 2000)
- 52.227-1 - Authorization And Consent (JUL 1995)
- 52.227-2 - Notice And Assistance Regarding Patent And Copyright Infringement (AUG 1996)
- 52.227-3 - Patent Indemnity (APR 1984)
- 52.228-5 - Insurance - Work on a Government Installation (JAN 1997)
- 52.229-3 - Federal, State, And Local Taxes (JAN 1991)
- 52.229-5 - Taxes - Contracts Performed In U.S. Possessions Or Puerto Rico (APR 1984)
- 52.230-2 - Cost Accounting Standards (APR 1998)
- 52.230-6 - Administration Of Cost Accounting Standards (NOV 1999)
- 52.232-1 - Payments (APR 1984)
- 52.232-8 - Discounts For Prompt Payment (FEB 2002)
- 52.232-9 - Limitation On Withholding Of Payments (APR 1984)
- 52.232-11 - Extras (APR 1984)
- 52.232-17 - Interest (JUN 1996)
- 52.232-23 - Assignment Of Claims (JAN 1986)
- 52.232-25 - Prompt Payment (FEB 2002)
- 52.232-33 - Payment By Electronic Funds Transfer-Central Contractor Registration (MAY 1999)
- 52.233-1 - Disputes (JUL 2002)
- 52.233-3 - Protest After Award (AUG 1996)
- 52.237-2 - Protection Of Government Buildings, Equipment, And Vegetation (APR 1984)
- 52.242-13 - Bankruptcy (JUL 1995)
- 52.243-1 - Changes - Fixed Price (AUG 1987)
- 52.243-1 - Changes - Fixed Price (AUG 1987) Alternate II (APR 1984)
- 52.244-6 - Subcontracts For Commercial Items (MAY 2002)
- 52.245-2 - Government Property (Fixed-Price Contracts) (DEC 1989)
- 52.245-19 - Government Property Furnished "As Is" (APR 1984)
- 52.246-23 - Limitation Of Liability (FEB 1997)
- 52.248-1 - Value Engineering (FEB 2000)
- 52.249-2 - Termination For Convenience Of The Government (Fixed Price) (SEP 1996)
- 52.249-4 - Termination For Convenience Of The Government (Services) (Short Form) (APR 1984)
- 52.249-8 - Default (Fixed-Price Supply And Service) (APR 1984)
- 52.251-1 - Government Supply Sources (APR 1984)

- 52.252-6 - Authorized Deviations In Clauses (APR 1984) fill in Defense Federal Acquisition Regulation Supplement (48 CFR Chapter 2);
 52.253-1 - Computer Generated Forms (JAN 1991)

DFARS CLAUSE TITLE

- 252.203-7001 - Prohibition On Persons Convicted Of Fraud Or Other Defense Contract Related Felonies (MAR 1999)
 252.204-7003 - Control Of Government Personnel Work Product (APR 1992)
 252.204-7004 - Required Central Contractor Registration (NOV 2001)
 252.205-7000 - Provision Of Information To Cooperative Agreement Holders (DEC 1991)
 252.209-7000 - Acquisition From Subcontractors Subject To On-Site Inspection Under The Intermediate-Range Nuclear Forces (INF) Treaty (NOV 1995)
 252.211-7005 **Substitutions for Military or Federal Specifications and Standards**
 252.209-7004 - Subcontracting With Firms That Are Owned Or Controlled By The Government Of A Terrorist Country (MAR 1998)
 252.219-7003 - Small, Small Disadvantaged And Women-Owned Small Business Subcontracting Plan (DoD Contracts) (APR 1996)
 252.223-7006 - Prohibition On Storage And Disposal Of Toxic And Hazardous Materials (APR 1993)
 252.225-7002 - Qualifying Country Sources As Subcontractors (DEC 1991)
 252.225-7007 - Buy American Act--Trade Agreements—Balance Of Payments Program (SEP 2001)
 252.225-7009 - Duty-Free Entry - Qualifying Country Supplies (End Products And Components) (AUG 2000)
 252.225-7012 - Preference For Certain Domestic Commodities (APR 2002)
 252.225-7016 - Restriction On Acquisition Of Ball And Roller Bearings (DEC 2000)
 252.225-7025 - Restriction On Acquisition Of Forgings (JUN 1997)
 252.225-7031 - Secondary Arab Boycott Of Israel (JUN 1992)
 252.226-7001 - Utilization of Indian Organizations and Indian-Owned Economic Enterprises-DoD Contracts (SEP 2001)
 252.227-7013 - Rights In Technical Data--Noncommercial Items (NOV 1995)
 252.227-7016 - Rights In Bid or Proposal Information (JUN 1995)
 252.227-7030 - Technical Data--Withholding Of Payment (MAR 2000)
 252.227-7036 - Certification Of Technical Data Conformity (JAN 1997)
 252.227-7037 - Validation Of Restrictive Markings On Technical Data (SEP 1999)
 252.231-7000 - Supplemental Cost Principles (DEC 1991)
 252.242-7000 - Postaward Conference (DEC 1991)
 252.242-7004 - Material Management And Accounting System (DEC 2000)
 252.243-7001 - Pricing Of Contract Modifications (DEC 1991)
 252.243-7002 - Requests For Equitable Adjustment (MAR 1998)
 252.244-7000 - Subcontracts For Commercial Items And Commercial Components (DOD Contracts) (MAR 2000)
 252.247-7023 - Transportation Of Supplies By Sea (MAY 2002)

- 252.247-7024 - Notification Of Transportation Of Supplies By Sea (MAR 2000) *(will be included if the successful offeror made a negative response to the inquiry at DFARS 252.247-7022)*
- 252.251-7000 - Ordering From Government Supply Sources (MAY 1995)

I-2 FAR 52.223-11 - OZONE-DEPLETING SUBSTANCES (MAY 2001)

(a) *Definitions.* "Ozone-depleting substance", as used in this clause, means any substance the Environmental Protection Agency designates in 40 CFR Part 82 as –

- (1) Class I, including, but not limited to, chlorofluorocarbons, halons, carbon tetrachloride, and methyl chloroform; or
- (2) Class II, including, but not limited to, hydrochlorofluorocarbons.

(b) The Contractor shall label products which contain or are manufactured with ozone-depleting substances in the manner and to the extent required by 42 U.S.C. 7671j (b), (c), and (d) and 40 CFR Part 82, Subpart E, as follows:

WARNING

Contains (or manufactured with, if applicable) _____, a substance(s) which harm(s) public health and environment by destroying ozone in the upper atmosphere.

*The Contractor shall insert the name of the substance(s).

I-3 DFARS 252.225-7008 - SUPPLIES TO BE ACCORDED DUTY-FREE ENTRY (MAR 1998)

In accordance with paragraph (b) of the Duty-Free Entry clause of this contract, in addition to duty-free entry for all qualifying country supplies (end products and components) and all eligible end products subject to applicable trade agreements (if this contract contains the Buy American Act - Trade Agreements - Balance of Payments Program clause or the Buy American Act - North American Free Trade Agreement Implementation Act - Balance of Payments Program clause), the following foreign end products that are neither qualifying country end products nor eligible end products under a trade agreement, and the following nonqualifying country components, are accorded duty free entry:

PART III - LIST OF DOCUMENTS, EXHIBITS, AND OTHER ATTACHMENTS

SECTION J

LIST OF ATTACHMENTS

J-1 Attachment (1) - Statement of Work - 30 Pages, with Exhibit A - DD Form 1423, Contract Data Requirements – 3 Pages.

J-2 Attachment (2) - Accounting and Appropriation Data. 1 page. *

(To be included at time of award)*

PART IV - REPRESENTATIONS AND INSTRUCTIONS

SECTION K

**REPRESENTATIONS, CERTIFICATIONS
AND OTHER STATEMENTS OF OFFERORS OR RESPONDENTS**

K-1 REPRESENTATIONS, CERTIFICATIONS, AND OTHER STATEMENTS OF OFFERORS OR RESPONDENTS

Each Offeror must submit a completed Representations, Certifications, and Other Statements Of Offerors or Respondents with its proposal which is available electronically in full text at <http://heron.nrl.navy.mil/contracts/rep&certs.htm>

Use Representations and Certifications: A

K-2 FILL IN FOR FAR 52.219-1 - SMALL BUSINESS PROGRAM REPRESENTATIONS (MAR 2001)

The fill in information is as follows:

The NAICS code for this acquisition is 333298

The small business size standard is 500

SECTION L
INSTRUCTIONS, CONDITIONS, AND NOTICES TO OFFERORS OR RESPONDENTS

L-1 52.252-1 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FEB 1998)

This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this/these address(es):

<http://www.arnet.gov/far>
<http://heron.nrl.navy.mil/contracts/home.htm>

FAR CLAUSE TITLE

- | | | |
|-----------|---|---|
| 52.204-6 | - | Data Universal Numbering System (DUNS) Number (JUNE 1999) |
| 52.214-34 | - | Submission Of Offers In The English Language (APR 1991) |
| 52.214-35 | - | Submission Of Offers In U.S. Currency (APR 1991) |
| 52.215-1 | - | Instructions To Offerors- Competitive Acquisition (MAY 2001) |
| 52.215-5 | - | Facsimile Proposals (OCT 1997)
Paragraph (c) is completed as follows: (202) 767- (primary) or (202) 767-0494 (alternate). In addition proposals may be transmitted by e-mail to @contracts.nrl.navy.mil (primary) or @contracts.nrl.navy.mil (alternate) in either Microsoft Word (version 97 or earlier) or pdf format. |
| 52.215-16 | - | Facilities Capital Cost Of Money (OCT 1997) |
| 52.237-1 | - | Site Visit (APR 1984) |

DFAR CLAUSE TITLE

- | | | |
|--------------|---|---|
| 252.209-7001 | - | Disclosure Of Ownership Or Control By The Government Of A Terrorist Country in all solicitations expected to result in contracts of \$100,000 or more. (MAR 1998) |
| 252.211-7005 | - | Substitutions For Military Or Federal Specifications And Standards (OCT 2001) |

L-2 SITE VISIT

An onsite visit will be available for three (3) days the date and time is August 15, 16, and 22 at 9:30AM to 11:30 AM and 1:30 PM to 3:30 PM for each day . The site visit will take approximately two hours to complete. Contact Cheri R. Burkhardt at (202)767-6542 to set up a site visit.

L-3 INSTRUCTIONS FOR RECEIPT OF PROPOSALS/OFFERS

All proposals shall be submitted in accordance with FAR 52.215-1- *Instructions to Offerors-Competitive Acquisition*. Proposals/offers submitted in paper media through the United States Postal Service (USPS) or overnight delivery services shall be addressed to:

Contracting Office
Naval Research Laboratory(NRL)
4555 Overlook Avenue, S.W.
Washington, D.C. 20375

Solicitation/RFP No. – N00173-02-R-CB04

Closing Date: _____ Time _____

Proposals may be hand delivered to the Contracting Office, NRL, 4555 Overlook Avenue, S.W., Washington, D.C. 20375, Building 222, Room 115 between the hours of 8AM until 4PM, local time, excluding weekends and federal holidays. NRL is a controlled-access facility. Photo identification will be required. Report first to Building 72, Visitor Control for access to NRL. After receiving a Visitor Pass, proceed directly to Building 222, Room 115, Contracting Office Receptionist to deliver the proposal. All offerors shall allow sufficient time for delivery of their proposal to the Contracting Office prior to the closing date and time announced in the solicitation. Directions and additional information about NRL is available at <http://www.nrl.navy.mil/aboutdc.htm>

If facsimile proposals are authorized, contracting officers may request offeror(s) to provide the complete; original signed proposal at a later date.

L-4 FAR 52.211-14 - NOTICE OF PRIORITY RATING FOR NATIONAL DEFENSE USE (SEP 1990)

Any contract awarded as a result of this solicitation will be a DX rated order; DO rated order certified for national use under the Defense Priorities and Allocations system (DPAS) (15 CFR 700), and the Contractor will be required to follow all of the requirements of this regulation.

L-5 FAR 52.215-20 REQUIREMENTS FOR COST OR PRICING DATA OR INFORMATION OTHER THAN COST OR PRICING DATA (OCT 1997)ALTERNATE IV (OCT 1997)

(a) Submission of cost or pricing data is not required.

(b) Provide information described below :

Offerors should provide information to enable the Contracting Officer to determine that the proposed price is fair and reasonable. Such information could include published price lists, information on previous sales of the same or similar items, or the projected costs of fabricating and installing the item (material costs, labor costs, etc).

L-6 FAR 52.216-1 - TYPE OF CONTRACT (APR 1984)

The Government contemplates award of a Firm Fixed Price Supply/Service (warranty/remedial maintenance)contract resulting from this solicitation.

L-7 FAR 52.233-2 - SERVICE OF PROTEST (AUG 1996)

(a) Protests, as defined in Section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the General Accounting Office (GAO) shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from the Receptionist Desk, Code 3200, Bldg. 222, Rm. 115, Naval Research Laboratory, 4555 Overlook Ave., S.W., Washington DC 20375-5326.

(b) The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

L-8 DFARS 252.227-7017 - IDENTIFICATION AND ASSERTION OF USE, RELEASE, OR DISCLOSURE RESTRICTIONS (JUN 1995)

- (a) The terms used in this provision are defined in following clause or clauses contained in this solicitation—
- (1) If a successful offeror will be required to deliver technical data, the Rights in Technical Data--Noncommercial Items clause, or, if this solicitation contemplates a contract under the Small Business Innovative Research Program, the Rights in Noncommercial Technical Data and Computer Software--Small Business Innovative Research (SBIR) Program clause.
 - (2) If a successful offeror will not be required to deliver technical data, the Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation clause, or, if this solicitation contemplates a contract under the Small Business Innovative Research Program, the Rights in Noncommercial Technical Data and Computer Software--Small Business Innovative Research (SBIR) Program clause.
- (b) The identification and assertion requirements in this provision apply only to technical data, including computer software documents, or computer software to be delivered with other than unlimited rights. For contracts to be awarded under the Small Business Innovative Research Program, the notification requirements do not apply to technical data or computer software that will be generated under the resulting contract. Notification and identification is not required for restrictions based solely on copyright.
- (c) Offers submitted in response to this solicitation shall identify, to the extent known at the time an offer is submitted to the Government, the technical data or computer software that the Offeror, its subcontractors or suppliers, or potential subcontractors or suppliers, assert should be furnished to the Government with restrictions on use, release, or disclosure.
- (d) The Offeror's assertions, including the assertions of its subcontractors or suppliers or potential subcontractors or suppliers shall be submitted as an attachment to its offer in the following format, dated and signed by an official authorized to contractually obligate the Offeror:

Identification and Assertion of Restrictions on the Government's Use, Release, or Disclosure of
Technical Data or Computer Software.

The Offeror asserts for itself, or the persons identified below, that the Government's rights to use, release, or disclose the following technical data or computer software should be restricted:

Technical Data Computer Software to be Furnished With Restrictions*	Basis for Assertion **	Asserted Rights Category ***	Name of Person Asserting Restrictions****
(List)*****	(List)	(List)	(List)

* For technical data (other than computer software documentation) pertaining to items, components, or processes developed at private expense, identify both the deliverable technical data and each such items, component, or process. For computer software or computer software documentation identify the software or documentation.

** Generally, development at private expense, either exclusively or partially, is the only basis for asserting restrictions. For technical data, other than computer software documentation, development refers to development of the item, component, or process to which the data pertain. The Government's rights in computer software documentation generally may not be restricted. For computer software, development refers to the software. Indicate whether development was accomplished exclusively or partially at private expense. If development was not accomplished at private expense, or for computer software documentation, enter the specific basis for asserting restrictions.

*** Enter asserted rights category (e.g., government purpose license rights from a prior contract, rights in SBIR data generated under another contract, limited, restricted, or government purpose rights under this or a prior contract, or specially negotiated licenses).

**** Corporation, individual, or other person, as appropriate.

***** Enter "none" when all data or software will be submitted without restrictions.

Date _____
 Printed Name and Title _____

 Signature _____

(End of identification and assertion)

- (e) An offeror's failure to submit, complete, or sign the notification and identification required by paragraph (d) of this provision with its offer may render the offer ineligible for award.
- (f) If the Offeror is awarded a contract, the assertions identified in paragraph (d) of this provision shall be listed in an attachment to that contract. Upon request by the Contracting Officer, the Offeror shall provide sufficient information to enable the Contracting Officer to evaluate any listed assertion.

L-9 DFARS 252.227-7028 - TECHNICAL DATA OR COMPUTER SOFTWARE PREVIOUSLY DELIVERED TO THE GOVERNMENT (JUN 1995)

The Offeror shall attach to its offer an identification of all documents or other media incorporating technical data or computer software it intends to deliver under this contract with other than unlimited rights that are identical or substantially similar to documents or other media that the Offeror has produced for, delivered to, or is obligated to deliver to the Government under any contract or subcontract. The

attachment shall identify - -

- (a) The contract number under which the data or software were produced;
- (b) The contract number under which, and the name and address of the organization to whom, the data or software were most recently delivered or will be delivered; and
- (c) Any limitations on the Government's rights to use or disclose the data or software, including, when applicable, identification of the earliest date the limitations expire.

L-10 GOVERNMENT-FURNISHED PROPERTY

No material, labor, or facilities will be furnished by the Government unless provided for in the solicitation.

L-11 INQUIRIES CONCERNING THE RFP

Any questions concerning the RFP must be submitted in writing to the Contracting Officer at the location noted in blocks 7 and 9 of the Standard Form 33, "Solicitation, Offer and Award," no less than fifteen (15) days before closing. The Government will not consider questions received after this date. Offerors are cautioned against directing any questions concerning this RFP to technical personnel at the Naval Research Laboratory.

L-12 INSTRUCTIONS FOR SUBMISSION AND INFORMATION REQUIRED TO EVALUATE PROPOSALS

- (1) Information for the technical/management proposal shall be placed in Volume I and be completely separate from the business proposal (Volume II).
- (2) Proposal Identification/Mailing - The proposal should be packaged for delivery so as to permit safe and timely arrival at destination. The proposal package should be sent to the address shown in Block 7 of the RFP face page and marked:

Solicitation No. N00173-02-R-CB04
Closing Date: September 6, 2002
(As specified in Block 9, RFP face page)
Attn: Code: 3230.CB

- (3) Proposal Format and Length - No attempt is made to restrict the proposal format and style. However, the proposal should be written and organized so as to be compatible with the RFP. Offerors are encouraged to use recycled paper and maximize the use of double sided copying when preparing responses to solicitations.

L-13 VOLUME I - TECHNICAL/MANAGEMENT PROPOSAL

REQUIRED COPIES: 1 ORIGINAL AND 4 COPIES .

(1)The following information is required for evaluation of your technical/management :

A. Technical Specification Compliance and Competence

The proposal provided must clearly demonstrate the offeror's ability to meet the specifications for the Tapered Anechoic chamber facility as stated in the SOW. It must also clearly demonstrate the offeror's understanding of the technical requirements necessary to construct a high-performance measurement chamber, as well as the offeror's technical expertise in this area. Description of all aspects of the construction of the chamber facility should be considered – with special emphasis on demonstrating the predicted electrical performance of the chamber. Mathematical understanding of tapered anechoic chambers and chamber design impacts on the size and the quality of the quiet zone should also be accomplished. Also, imperative to the use of the tapered anechoic chamber facility itself is a proper addressing of the issues involved with construction of the larger supporting facility, from an RF and electrical standpoint, security and safety standpoint, as well as the usefulness and suitability for use by the operators. The offeror should provide as much detail about the proposed facility as possible, including preliminary drawings, computed/estimated RF electrical performance, and other information where applicable. The offeror must demonstrate that the proposed capability meets or exceeds performance requirements.

Any deviations from the specifications must be discussed.

B. Critical Component Review

The proposal provided must clearly demonstrate the offeror's ability to meet the specifications for the Tapered Anechoic chamber facility as stated in the SOW. It must also clearly demonstrate the offeror's understanding of the technical requirements necessary to construct a high-performance measurement chamber, as well as the offeror's technical expertise in this area.. The offeror should provide details data sheets describing these components: all types of anechoic chamber RF absorbing foam, the construction and performance of door assemblies, power line filters, and other information that the offeror believes will help complete the government understand the entire design.

Any deviations from the specifications must be discussed.

C Corporate Experience

Proposals must provide a narrative description of company experience on projects with tasks similar to those required in the Statement of Work. The experience to be addressed include: (1) tapered anechoic chamber system design and implementation, (2) complete testing and performance assessment and (3) integration into existing facilities. The offeror shall indicate past

experience on related contracts and the internal research and development efforts of both the offeror and relevant subcontractors

D. PAST PERFORMANCE INFORMATION

(a) Offerors shall submit the following information as part of their proposal. (Offerors are encouraged to submit the information prior to other parts of the proposal to assist the government in reducing the length of the evaluation period.) List the last 6 contracts or subcontracts completed by the offeror or predecessor companies during the past 4 years for services similar in nature to this requirement. Include in the 6 any current contracts or subcontracts for similar services that were awarded at least one year prior to the date of this solicitation. Offerors that have no similar previous or current contracts should provide the requested information for proposed subcontractors that will perform major or critical aspects of the requirement or for the proposed project manager or key personnel responsible for major or critical aspects of the requirement.

1. Name of contracting organization.
2. Contract number
3. Contract type
4. Total contract value
5. Description of the contract work
6. Contracting officer and telephone number
7. Contracting officer's representative, program manager, or similar official and telephone number

(b) Offerors shall contact the contracting organizations identified pursuant to paragraph (a) as soon as possible and request them to send past performance information on the identified contracts to the address in Block 7 of the face page of this solicitation. The past performance report which is available electronically in full text at <http://heron.nrl.navy.mil/contracts/home.htm> is to be provided to the contracting organization for this purpose. If the contracting organization has already collected past performance information on the contract pursuant to FAR Subpart 42.15, the format used to collect the information may be used instead of the past performance report.

(c) Offerors may include in their proposals specific information relating to problems encountered in performing the identified contracts and any corrective actions by the offeror. Offerors should not provide general information on their performance on the identified contracts as this will be obtained from the contracting organizations.

L-14 VOLUME II - BUSINESS PROPOSAL

REQUIRED COPIES: 1 ORIGINAL AND 3COPIES

(1) PRICE PROPOSAL

The offeror shall submit a business proposal that includes a price proposal with supporting information. The supporting breakdown should include such elements as materials, direct labor, indirect cost, and other costs such as travel. The offeror shall provide exhibits as necessary to substantiate the price.

(2) SMALL BUSINESS PARTICIPATION

(a) In addition to complying with the clause at FAR 52.219-9, Small Business Subcontracting Plan (JAN 2002) with its Alternate II (OCT 2000), proposals must include information to permit evaluation of the extent of participation of small businesses and historical black colleges or universities and minority institutions in performance of the contract. Participation to be identified may be in the form of a joint venture, teaming arrangement, or subcontract. Small business concerns that are not required by FAR 52.219-9 to submit a subcontracting plan must indicate the extent to which proposed joint ventures, teaming arrangements, or subcontracts are with historically black colleges or universities and minority institutions. Information provided should include the extent of participation of such firms in terms of the value of the total acquisition and the complexity and variety of the work such firms are to perform.

SECTION M EVALUATION FACTORS FOR AWARD

M-1 EVALUATION

Award will be made to that offeror whose proposal is determined to be the best value to the Government, proposed price and other factors considered. The Government reserves the right to make award to other than the low offeror.

M-2 EVALUATION FACTORS FOR AWARD

Proposals will be evaluated in accordance with the following criteria. The technical factor is more important than the price factor.

The technical subfactors are listed in descending order of importance with Technical Specifications Compliance and Competence being significantly more important than the remaining three (3) technical subfactors.

M-2-1. TECHNICAL/MANAGEMENT

A. Technical Specifications Compliance and Competence

The proposal will be evaluated based on the offeror's technical capability in meeting the requirements of the Tapered Anechoic Chamber Facility described in the Statement of Work (SOW). The proposal, which best meets or exceeds the specifications in the SOW will be rated the highest in this category. The Technical Competence of the offeror will also be evaluated on the basis of the knowledge demonstrated in the understanding of the requirements of designing and constructing the Tapered Anechoic chamber itself, and the supporting facility in general. Technical information on the proposed design and implementation of the facility should be clear

and show to the Government the offeror's ability to meet the critical performance specifications.

B. Critical Component Review

The proposal will be evaluated based on the offeror's selection of critical components to be used in building the facility. Since the design and implementation of an anechoic chamber facility includes key components, which impact the electrical performance of the system as a whole most strongly, this is being evaluated separately from the technical approach. This criterion will examine the use of critical materials and how their selection will meet the required specifications when used in the design provided by the offeror. The offeror will also be evaluated on the selection of these key components and their ability, coupled with the design they propose (Technical factor 1) shall demonstrate that the combination of design and materials will meet the specifications

C. Corporate Experience

The proposal will be evaluated based on the offeror's corporate expertise in work which is closely related to the efforts required in the Statement of Work. The experience of the offeror and proposed subcontractors shall be evaluated for appropriate expertise in the technical fields relevant to the design, analysis, development and testing of a high performance anechoic systems, both large and small.

D. PAST PERFORMANCE

Past performance will be evaluated on the basis of the quality of the work performed or supplies delivered and timeliness of performance or delivery. The evaluation will be based on the information provided pursuant to Section L and other sources if available. The evaluation will take into account past performance information regarding predecessor companies, subcontractors that will perform major or critical aspects of the requirement, or the proposed project manager or key personnel responsible for major or critical aspects of the requirement. Offerors that have no relevant performance history or for which past performance information is not available will not be evaluated favorably or unfavorably on past performance. The government may begin proposal evaluation prior to receipt of past performance information. If, after completion of proposal evaluation except evaluation of past performance, the contracting officer determines that evaluation of past performance will not affect the outcome of competitive selection, the contracting officer may waive its evaluation in accordance with FAR 15.304(c)(3)(iv).

M-2-2 PRICE TO THE GOVERNMENT

Proposed estimated price to the Government.

M-2-3 SMALL BUSINESS PARTICIPATION

(a) The extent of participation of small businesses and historically black colleges or universities and minority institutions in performance of the contract will be evaluated on the basis of the proposed extent of participation of such firms in terms of the value of the total acquisition and the complexity and variety of the work such firms are to perform.

M-3 AWARD BY FULL QUANTITY

An offeror must propose on all items in this solicitation to be eligible for award.

M-4 FAR 52.217-5 - EVALUATION OF OPTIONS (JUL 1990)

Except when it is determined in accordance with FAR 17.206(b) not to be in the Government's best interests, the Government will evaluate offers for award purposes by adding the total price for all options to the total price for the basic requirement. Evaluation of options will not obligate the Government to exercise the option(s).

**STATEMENT OF WORK
DESIGN AND INSTALLATION OF
A TURNKEY ANECHOIC CHAMBER/RF TEST FACILITY**

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1. INTRODUCTION

This SOW establishes the design, construction, quality assurance and safety requirements of a turnkey Anechoic Chamber/RF Test Facility, consisting of a facility housing a Tapered Anechoic Chamber primarily for antenna testing over the frequency range of 100 MHz to 100 GHz, as shown in Figure 1. The facility house both the Tapered Anechoic Chamber and provide laboratory space for RF measurements and R&D work, plus serve as a control room for the tapered chamber. Hereafter in this document, the “room” that encloses the tapered anechoic chamber and the laboratory space will be referred to as the “Chamber Facility”. The shielded, anechoic foam equipment unit will be referred to as the “tapered anechoic chamber.”

The provision of RF instrumentation equipment, antenna positioners and associated control equipment is not included as a requirement for this procurement, with the exception of an option to provide network analyzer equipment.

2. BACKGROUND

This facility is being constructed to replace an existing facility located in building 68 at NRL. The existing facility will be lost when building 68 is demolished in 2003/2004 in accord with an existing plan. Code 8000 has used the existing facility for the last 25 years in the testing and analysis of antennas and antenna systems for both space applications and ground applications. It's anticipated that critical Program requirements will continue to include antenna development and test into the future, along with associated receiver and signal analysis.

3. SCOPE

The contractor shall be responsible for the design, construction, assembly, installation, performance testing, documentation, materials, and labor for a complete and functional facility. The facility shall be used for RF antenna testing. The facility will be subjected to varying and movable floor loads, repetitious use of the access doors, and continuous duty cycle of all ancillary equipment.

The Chamber/RF Test facility shall include the following as a minimum:

- Modular panel anechoic chamber
- Lighting (with Filters)
- Penetrations - Doors, Ventilation, Connector Panels
- Electrical Power (with Filters)
- Heating Ventilation and Air Conditioning (HVAC)
- Fire Protection
- Ceiling Hoist in Chamber Work Area
- Smoke Duct with Security Grill
- Source Antenna Positioner Mount
- Designated Storage Areas

Existing capability shown in photos of the existing chamber (Exhibit C) shall be considered part of the minimum requirements.

4. APPLICABLE DOCUMENTS

The following documents of the issue in effect on the date of contract award, form a part of this SOW. The NRL contracting office will be able to supply copies of internal NRL reports. Commercial standards documents should be acquired from the appropriate standards body.

4.1 MILITARY STANDARDS

DCID 1/21 Physical Security Standards For Sensitive Compartmented Information Facilities
<http://www.fas.org/irp/offdocs/dcid1-21.htm>

4.2 NRL INSTRUCTION

5101.3C Fire Safety In Anechoic Chamber Operations 7/13/98

4.3 NRL REPORT

8093 “Modified Smoldering Test of Urethane Foams Used in Anechoic Chambers”
Tests 1, 2 and 3.

4.4 IEEE STANDARDS

IEEE-STD-299 Attenuation Measurement for Enclosures, Electromagnetic Shielding for Electrical Test Purposes, Method of
<http://odysseus.ieee.org/query.html?qt=299&qc=isol&col=isol&qp=&qs=&ws=0&qm=0&st=1&nh=25&lk=1&rf=0&oq=&rq=0&submit=+search+>

4.5 COMMERCIAL STANDARDS

4.5.1 American Institute of Steel Construction (AISC) Publications

S303 Code of Standard Practices for Steel Buildings and Bridges
<http://www.aisc.org/template.cfm?Template=/search/searchdisplay.cfm>

S335 Specification for Structural Steel Buildings 9th ed. Allowable Stress Design (ASD), Manual of Steel Structures
<http://www.aisc.org/Template.cfm?Section=Search&template=/Search/SearchDisplay.cfm>

4.5.2 American Society Of Civil Engineers (ASCE) Publications

ASCE 7-95 Minimum Design Loads for Buildings and Other Structures
http://www.asce.org/publications/dsp_pubdetails.cfm?puburl=http://www.pubs.asce.org/BOOKdisplay.cgi?9601615

4.5.3 American Welding Society (AWS) Publications

AWS D1.1 Structural Welding Code - Steel
<http://www.aws.org/pr/nov6a-2001.html>

AWS D1.3 Structural Welding Code - Sheet Steel
<http://www.aws.org/>

AWS B2.1 Specification for Welding Procedure and Performance Qualification
<http://www.aws.org/pr/jul31-2001.html>

4.5.4 International Conference Of Building Officials (ICBO) Publications

1997 Ed. Uniform Building Code
<http://www.icbo.org/gateway/001C97.html>

4.5.5 National Fire Protection Association (NFPA) Publications

70-1998 National Electrical Code
http://www.nfpa.org/Codes/NFPA_Codes_and_Standards/List_of_NFPA_documents/NFPA_70.asp

NFPA 13 Standard for the Installation of Sprinkler Systems
http://www.nfpa.org/Codes/NFPA_Codes_and_Standards/List_of_NFPA_documents/NFPA_13.asp

NFPA 72 National Fire Alarm Code(r)
http://www.nfpa.org/Codes/NFPA_Codes_and_Standards/List_of_NFPA_documents/NFPA_72.asp

NFPA 90A Standard for the Installation of Air-Conditioning and Ventilating Systems
http://www.nfpa.org/Codes/NFPA_Codes_and_Standards/List_of_NFPA_documents/NFPA_90a.asp

NFPA 101 Code for Safety to Life from Fire in Buildings and Structures
http://www.nfpa.org/Codes/NFPA_Codes_and_Standards/List_of_NFPA_documents/NFPA_101.asp

4.5.6 Underwriters' Laboratories, Inc Publications

UL 486A Standard for Safety; Wire Connectors and Soldering Lugs for use with Copper Conductors
<http://www.comm-2000.com/ULstandard5B.asp>

UL 1283 Standard for Safety; Electromagnetic Interference Filters
<http://www.comm-2000.com/ULstandard5B.asp>

4.5.7 National Electrical Manufacturers Association (NEMA)

http://www.nema.org/index_nema.cfm/1427/

250-1997 Enclosures For Electrical Equipment (1000 Volts Maximum)

Sg 5-1995 Power Switchgear Assemblies

Wd 1-1983 General Requirements For Wiring Devices

Wd 6-1996 Wiring Devices - Dimensional Requirements

4.5.8 Factory Mutual Loss Prevention Data I-53

<http://www.fmglobal.com/scripts/store/product.asp?P9810>

4.5.9 Free Space VSWR Method for Testing Anechoic Chamber Quiet Zone

J. Appel-Hansen, "Reflectivity Level of Radio Anechoic Chambers", IEEE Trans. On Antennas and Propagation, vol AP-21, No.4, July 1973.

5. REVIEWS AND MEETINGS

5.1 KICK-OFF MEETING

A kick-off meeting shall be held at the government facility seven (7) days after contract award. The government will provide the agenda for the meeting, which will include NRL facilities personnel as well as the required technical personnel. The government will make all Bldg A59 drawings, mechanical and electrical, available for review by the contractor. The contractor will be required to search all building drawing files, and perform field verification inspections, to determine accurate existing conditions.

5.2 PRELIMINARY DESIGN REVIEW (PDR)

A Preliminary Design Review (PDR) between the contractor architect-engineers and the government representatives shall be held at the government's facility 2 weeks after contract award. The government will provide the agenda for the meeting. At this time the contractor shall provide the following documentation in accordance with Exhibit (A): (a) preliminary construction schedule, (b) list of outline shop drawings, (c) summary of equipment design and performance objectives, (d) Outline of Quality Assurance Control Plan, (e) and Outline of Safety Plan. The purpose of this design review is to make sure everyone understands the requirements and answer any questions that might exist. The contractor shall provide all the PDR documentation for review, comments, and approval.

5.3 CRITICAL DESIGN REVIEW (CDR)

A Critical Design Review (CDR) between the contractor architect-engineers and the government representatives shall be held at the government's facility 45 days after contract award. The government will provide the agenda for the meeting. At this time the contractor shall provide the following documentation in accordance with Exhibit (A): (a) construction schedule, (b) outline shop drawings, (c) equipment design and performance objectives, (d) electrical circuit schematics, (e) a bill of material for all major components, (f) the Quality Assurance Control Plan, (g) and the Safety Plan. The purpose of the design review is to assess if specified electrical and mechanical requirements have been properly and fully interpreted and understood. The contractor shall provide all the CDR documentation for review, comments, and approval.

6. TECHNICAL REQUIREMENTS

6.1 GENERAL

6.1.1 Work Site

The work site for this contract is located within Building A59 of NRL. Building A59 is a large "high-bay" facility with a concrete floor. The area for installation of this facility has no roof-supporting column or other obstructions to complicate construction.

Contractor personnel shall be restricted to the designated work area and shall not be allowed in adjoining rooms without prior approval of the government representative in charge of construction. The Government will designate an area for storage of all contractor materials and equipment and the contractor shall provide adequate environmental protection for all stored materials. The contractor shall maintain a clean work area upon completion of the day's work.

6.1.2 Available Floor Space

The anechoic chamber facility shall consist of the outer room, and the inner tapered chamber facility – far field range. The larger room will be the chamber room/enclosure, with the smaller anechoic chamber within it, as shown in Figure 1. Both facilities share a common wall on the south side and west side. The floor space available for the main facility room is nominally 63 (l) x 29(w) feet. The room shall be positioned in the available floor space of Bldg A59 as shown in Figure 1. The floor of the parent building is reinforced concrete. Support columns for the A59 structure are indicated on the diagram below.

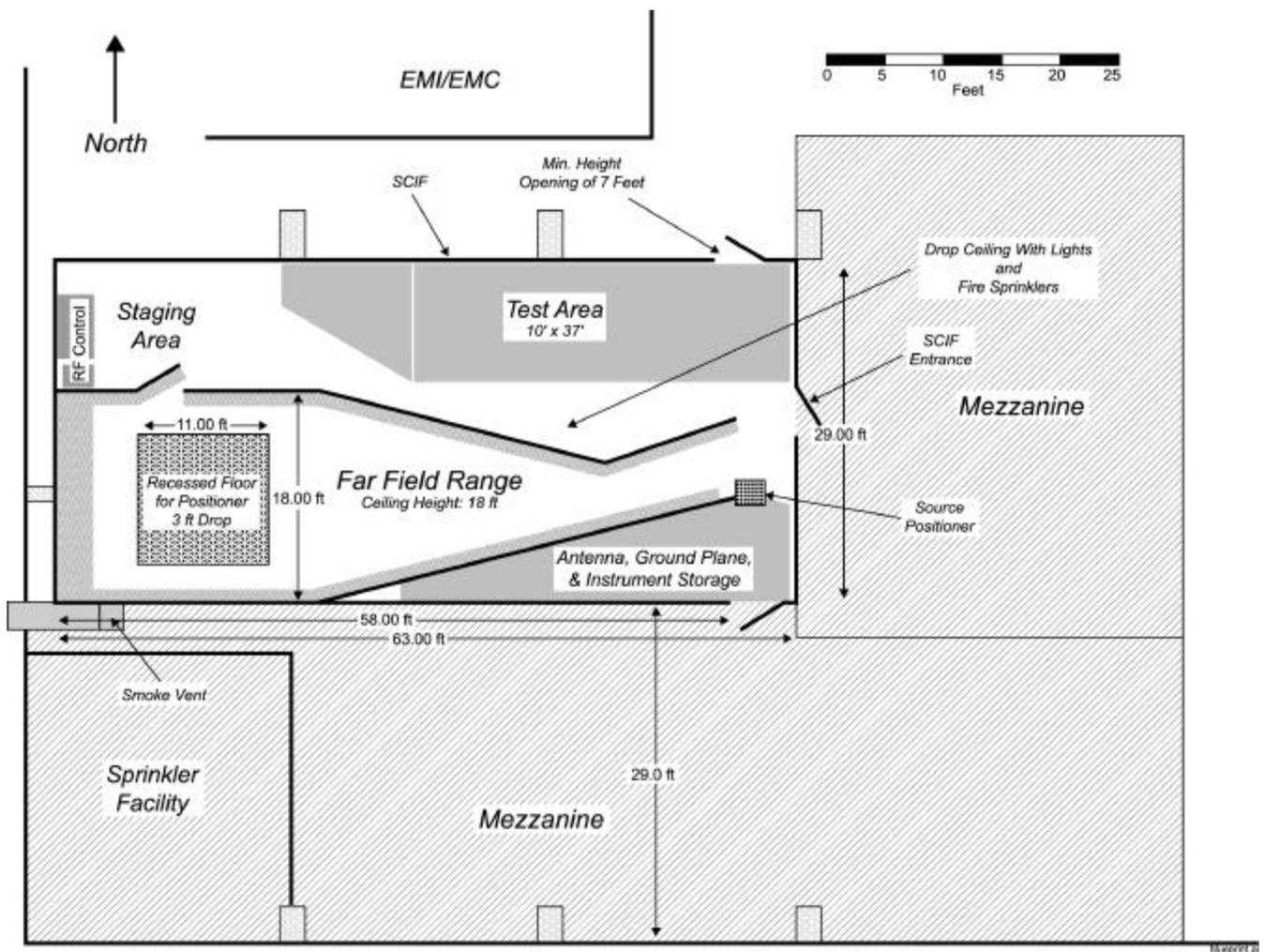


Figure 1. Building A59 Floor Plan

6.1.3 Heating Ventilation and Air Conditioning (HVAC)

The contractor shall install a standalone, package unit HVAC system in accordance with local, state, and federal building and safety codes. The HVAC system shall include, as a minimum, the HVAC package unit, the air handler, ductwork, filters, and all controls. The contractor will utilize standard HVAC industry “best practices” to calculate the HVAC systems capacity required. The contractor shall install a steam to hot water heat exchanger and use hot water reheat coils. The HVAC shall use hot water reheat coils for humidity control. The parent building will supply the steam. The contractor shall install a humidistat to monitor the humidity in the shielded enclosure and the anechoic chamber. The ductwork shall provide fresh outside air from outside of Bldg A59, and exhaust ducts shall take exhaust air outside of Bldg A59, and should utilize a fresh-air heat exchanger system. Fresh air will be electronically filtered.

The contractor shall assume when performing head-load calculations that the exterior temperature of the chamber may reach temperatures as high as 50° C. The contractor cannot dump heat loads from a forced air condenser unit into the high bay air space of Bldg A59. A chilled water heat exchanger for cooling would be acceptable, and NRL will supply chilled water connections at the building site. No humidification is required.

The required temperature range shall be from 65°F to 75°F with thermostatic control. The required humidity shall be a max of 55%. The contractor should assume a 30kW heat load inside of the chamber facility, in addition to loads provided by lighting and exterior walls. The contractor may assume that the concrete slab floor does not exceed 70 degrees F.

Split systems, central ceiling-duct systems, and central raised-floor systems are acceptable possibilities, assuming they meet the other requirements.

The HVAC system shall be controlled via a programmable electronic thermostat.

6.1.4 Parent Building Floor Levelness

The parent building concrete floor levelness shall be determined by measurement. It is assumed that the floor or sub-floor of the quiet zone, where positioner position would be mounted will be level in two-dimensions to within 0.1 degree.

6.1.5 Fire Protection

The contractor shall comply with all codes and regulations set forth in NRL 5101.3C (Para. 4.2) Fire Safety and Anechoic Chamber Operations Manual (Attachment 2) and Factory Mutual Loss Prevention Data I-53 (Para. 4.5.8), NFPA 13, NFPA 72 and NFPA 90A (Para. 4.5.5). The contractor shall provide the government with a manufacturers Material Safety Data Sheet (MSDS) for all materials used. All anechoic chamber absorber, that may have to be installed must meet NRL 5101.3C (Para. 4.2) and have had a period of at least 6 months (post manufacturing) to off-gas organic vapors. Contractor will be required to run flow test and pressure test by opening a hydrant and making measurements. NRL will be required to send Fire Protection plans to CHESDIV for review and approval.

The tapered chamber and its contents shall be protected from fire hazards by the use of a pre-action telescoping sprinkler system. The design of the fire protection system shall be configured such that the detection of any

possible combustion inside the chamber shall generate visual and audible alarms in the control room and surrounding areas.

6.1.5.1 Requirements for the Tapered Chamber's Pre-Action Sprinkler System

- Ordinary temperature, quick response, upright sprinklers installed in the pendent position (telescoping)
- Design density of $0.60 \text{ gpm}/\text{ft}^2$. The design area shall be the entire floor area of the chamber. Include a hose stream allowance of 500 gpm.
- Sprinklers spaced no more than 10 feet on center.
- Sprinkler deflector shall extend at least 6 inches beyond the tip of the liner material for pyramids up to 1 foot long and 12 inches for pyramids exceeding 2 feet.
- Provide an air sampling smoke detection system. Smoke sampling system shall have two alarm points based on obscuration levels. First alarm point shall initiate the buildings fire alarm system. The second alarm point shall activate the pre-action sprinkler system.

6.1.5.2 Requirements Chamber Facility (Outside Tapered Enclosure)

- Photoelectric, spot-type smoke detectors.
- Wet-pipe sprinkler system with a design density of $0.20 \text{ gpm}/\text{ft}^2$ over the entire area.
- Ordinary temperature, quick response sprinklers.
- Maximum sprinkler spacing of 130 ft^2 .
- 500 gpm hose stream allowance.
- Provide dry-chemical fire extinguishers (4A:60B:C).

The fire alarm panel shall be located in the control room area and integrated into the host building's fire alarm system located in Bldg. A-59. Air sampling smoke detection system shall be located in the anechoic chamber. Photoelectric spot-type smoke detectors shall be located in the control room area.

The telescoping sprinkler heads are only required in the anechoic chamber area. OSHA approved or UL (Para. 4.5.6) approved sprinkler heads shall be utilized in the control room area.

6.1.5.3 Powered Smoke Vent

A powered smoke vent will be provided in the anechoic chamber, for the purpose of exhausting fumes after a fire. Manual control shall be provided and be accessible from outside the chamber facility, with instructions for use by the Fire Dept.

6.1.6 Contractor Furnished Equipment (CFE)

The contractor shall supply the cranes, compressed air, and all other special facilities to construct, assemble, and install the anechoic chamber facility. Single phase 115 Volt, 60 Hz electrical power shall be made available to the contractor at the construction site.

6.1.7 REMEDIAL MAINTENANCE

The contractor shall provide warranty/remedial maintenance support for the complete chamber facility for a period of five (5) years from the completion of construction. The warranty/maintenance covers parts, material, and labor for any chamber components that do not carry their own commercial warranty as supplied by the manufacturer. During the warranty/maintenance period, the contractor will replace or repair components that fail due to a construction or manufacturing defect. The chamber manufacturer, when contacted about a warranty/maintenance support, shall provide a plan for addressing the issue within two business days, and make the necessary fixes within 5 business days.

All “consumable” components to the chamber facility for the operational period of five years should be provided by the contractor.

The chamber manufacturer will provide, without extra charge, telephone support to the chamber operators to diagnose both electrical and performance issues that occur, as well as facility issues as required, within the scope of this facility.

6.2 CHAMBER FACILITY (Exterior Room)

6.2.1 General Chamber Facility Construction Requirements

The Outer chamber facility shall be constructed in accordance with the requirements contained in the Federal Spec DCID 1/21 (Para. 4.1) such that the chamber facility can be certified for use as a SCIF (Sensitive Compartmented Information Facility). Note that this specification defines how penetrations are made into and out of the chamber facility, construction techniques (drywall type, thickness, stud design), acceptable entry and egress door types, and many other specifications not listed here.

In general, it is assumed that the general facility will be constructed with steel-stud construction, with drywall on both the interior and exterior walls of the facility. Drywall will be finished, taped, and painted with a primer and final topcoat with white paint, on both the interior and exterior walls of the facility. Walls should be finished with baseboard molding at the bottom, and walls should be caulked and sealed both on the interior and exterior drywall against air, dirt, and pest infiltration.

Roof loading for the chamber facility structure meet ASCE and UBC requirements (Para. 4.5.2). However, see requirements later for roof-structure mounted source system.

The facility will be installed within the interior of an existing structure, so no exterior sheathing, weatherproofing, or shingles are required. However, the interior of the larger structure is not climate controlled, and the contractor should consider provide insulation for both the walls and ceiling of the chamber facility to provide energy efficiency.

The floor of the chamber facility itself should be provided by the floor of the existing concrete floor of the existing structure, and covered in vinyl tile. The contractor should bid a 1 ft to 18” raised flooring system.

The interior ceiling of the chamber facility should be constructed of a grid – acoustical tile arrangement. This surface should be at least 12 feet from the floor of the facility. Fire protection / suppression equipment may be located above the acoustical tile ceiling (with sprinkler heads protruding) and below the structural roof of the facility. The facility should be constructed such that the ceiling of the facility is supported only around the perimeter and not with internal columns, so the interior space is unobstructed.

6.2.2 Material

All materials, parts, mechanical and electrical assemblies used in the installation of the Anechoic Chamber Facility shall be new, undamaged and of a quality consistent with the usage of the Anechoic Chamber Facility. Certificates shall be submitted to the TM attesting that the materials used in the Anechoic Chamber Facility fabrication meet the requirements specified herein. If requested, material samples shall be provided.

6.2.3 Interior Floors

The finished floor of the shielded enclosure shall be covered with 1/8 inch commercial vinyl tile. The contractor shall provide protection from any moisture accumulating between the underlying floor and finished floor in each chamber. The floor shall be prepared as appropriate, cracks such repair as appropriate.

6.2.4 Loading

The facility ceiling must be capable of supporting loads in accordance with ASCE and UBC requirements (Para. 4.5.2).

The facility walls shall be capable of supporting loads in accordance with ASCE and UBC requirements (Para. 4.5.2).

The facility sub-floor, when suitably supported by the parent-building floor, must be capable of supporting a minimum floor load of 1000 pounds per square foot. The finished floor shall be capable of supporting loads of 1000 pounds per square foot and point loads of 1000 pounds on suitable casters.

The facility ceiling shall support a walk-on load and provide storage for light loads consisting of antennas. A suitable surface shall be installed above the ceiling and utilize the ceiling support structure.

6.2.5 Facility Size

The anechoic chamber facility dimensions shall be 63 feet (l) x 29 feet (w) x 18 feet (h) as shown in Figure 1.

6.2.6 Penetrations

6.2.6.1 General

All penetrations of the chamber facility shall be protected in a manner that conforms to the SCIF specifications, Federal Spec DCID 1/21 (paragraph 4.1).

6.2.6.2 Doors

The facility shall be supplied with two doors, the dimensions are (1) 6' x 7' double door at the east location and (1) 42" x 7' single door at the southeast location. The southeast location, single door, should be designed with a "vestibule", and an interior door. The vestibule area should be approximately 6' x 6'. Federal Spec DCID 1/21 should be used when selecting doors. Contractor shall provide "Cypher Lock" (or equivalent) electronic access systems for all doors, although the NRL Lock Shop will perform installation after the conclusions of the construction period.

The contractor shall include a door maintenance kit and a recommended maintenance schedule if required.

6.2.6.3 Shielded Vents

The contractor shall design and install the air conditioning and heating ducts through the walls and ceiling of the chamber facility. The contractor shall use meet the requirements of SCIF specifications, Federal Spec DCID 1/21.

6.3 TAPERED ANECHOIC CHAMBER – FAR FIELD RANGE

6.3.1 Anechoic Chamber Effectiveness: Quiet Zone Performance Requirement / Reflected Attenuation

The minimum attenuation values specified below shall be obtained throughout the entire quiet zone at all test locations. When tested by use of the Free-space VSWR Method (Para. 4.5.9), the completed anechoic chamber shall provide minimum reflection attenuation, in accordance with the following.

Frequency	Maximum Reflection Level Goal	Maximum Reflection Level Requirement
100 MHz	-32 dB	-28 dB
220 MHz	-34 dB	-30 dB
500 MHz	-42 dB	-37 dB
1 GHz	-47 dB	-41 dB
3 GHz	-52 dB	-46 dB
10-40 GHz	-55 dB	-50 dB
100 GHz	-50 dB	-45 dB

The contractor shall propose a complete chamber facility and provide a shielded floor.

6.3.2 Anechoic Chamber Effectiveness: Cross-Polarization Performance

The tapered anechoic chamber will provide cross-polarization performance to at least 40 dB isolation between polarizations.

6.3.2.1 Contractor Supplied Equipment

The contractor must supply all test equipment required to perform this test, including test equipment, positioner equipment (if required), and data-collection and recording means.

6.3.3 Tapered Anechoic Chamber Physical Specifications

The tapered chamber (see Fig.2) shall be 18ft. high x 18ft. wide x 58ft. long. The conical taper apex with flat absorber shall be 11ft. long to accommodate the required source antennas. Since the existing source antennas will be used with the new chamber, the taper of the first 11-foot section must be the same as the existing chamber. The government can make available to the contractor for short periods the source antennas for fit checking and other purposes. The conical taper shall be split in the vertical plane and one side shall swing open, a wheel shall support this swinging side so no sag is experienced upon opening and re-closing.

- The source positioner shall be ceiling-mounted (See C5).
- There shall be lighted storage space under the taper.
- There shall be ladder access to storage space above taper (See C8).
- There shall be access to lighted storage space behind taper.
- A video camera shall be installed in the taper, for viewing the quiet zone during test. The video camera will be connected to a monitor located at the control console.
- Note: In figure 2 below, the critical dimensions for the chamber are indicated. Other unspecified dimensions should be determined by the electrical design of the chamber .

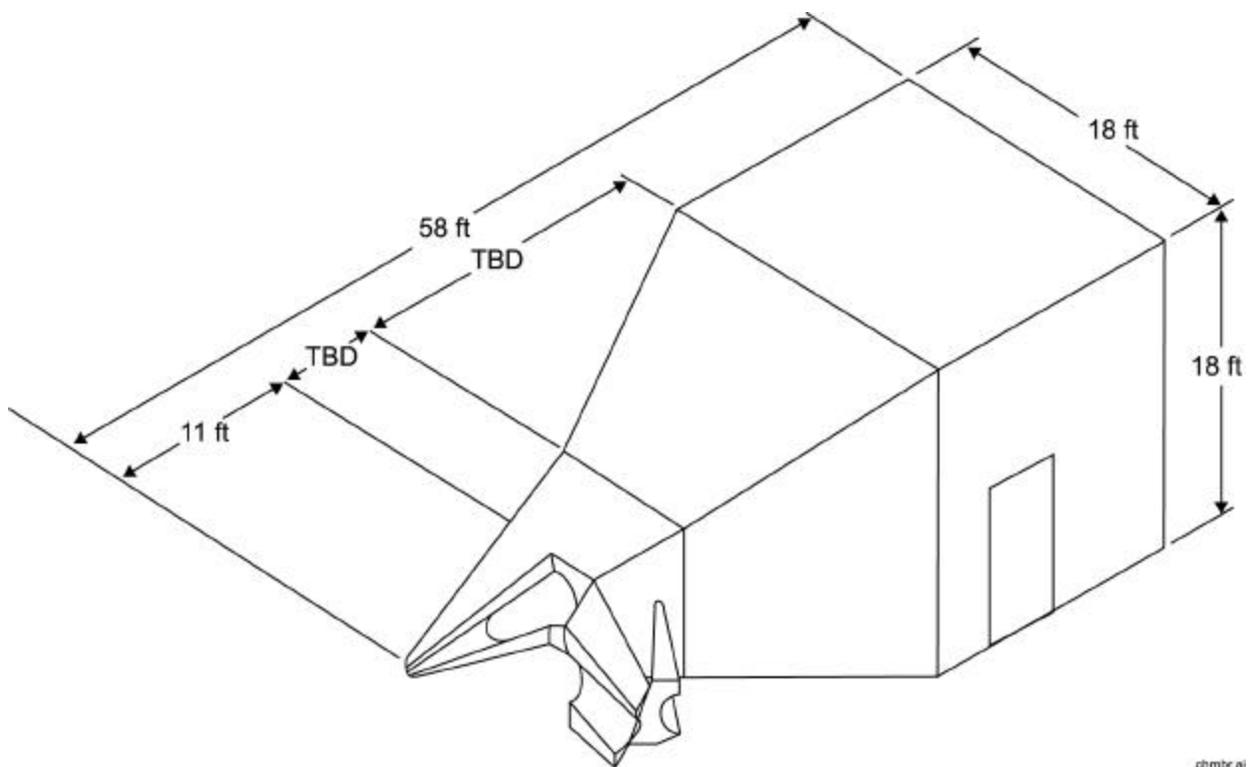


Figure 2. Anechoic Chamber Overview (based on existing design)

6.3.4 RF/Electrical Specifications

Quiet Zone	6ft. diameter sphere.
Primary Frequency Range	220 MHz – 40 GHz.
Secondary Frequency Ranges	100 MHz – 220 MHz 40 GHz – 100 GHz

6.3.5 RF Absorber Material

The absorber material shall be Pyramidal and/or Wedge Shaped, manufactured from Urethane Foam.

The absorber materials shall be highly fire retardant meeting NRL Report 8093 Tests 1, 2 and 3 (Para. 4.3) and test results from each manufacturing batch shall be submitted with the material. The manufacturer shall certify the absorber to conform to ASTM-E84-97 Class A Material. Test results shall be submitted but the test need not be performed on the exact batch of material supplied for this project.

Walkway absorber material, capable of supporting 200 lb/sq.ft., shall be installed for access from the door to the positioner, covering the floor and surrounding area of the rectangular section. This floor material shall be removable for any maintenance or repair. Walkway panels shall be 24 in.x 48 in.

6.3.6 Ceiling Hoist

An electrically operated hoist shall be mounted on the roof of the Chamber facility over the quiet zone, with a hook that can be dropped into the quiet zone through a hatch in top of the tapered anechoic chamber. It shall be operated with a hand-held remote control which shall be able to be disconnected and removed from the chamber when not in use. The hoist shall connected to a safety switch that allows disconnection of both the hot and neutral wires so that the remote control system is completely de-energized when not in use. The hoist shall be cable of lifting loads of up to 750 lbs. The unit shall be used to assist in the mounting of test articles on the model tower.

6.3.7 Absorber Installation

The RF absorber shall be installed so it is permanently bonded in place. Given an adhesive bonding of the absorber, the contractor will warrant proper bonding and adhesive performance.

Good workmanship and installation practices shall be followed so there are no gaps between installed absorber and the wedges are well aligned.

6.3.8 Chamber Performance Test

The finished anechoic installation shall be performance verified via a free space VSWR test at 10 frequencies, each at two polarizations and at one elevation. The contractor is to provide a NRL-approved independent tester to perform the chamber performance verification tests. The independent tester can not be changed by the contractor unless approved by NRL. The contractor will not be permitted back into the chamber facility until the independent testing has been completed. The contractor should assume that no government-furnished equipment will be available for the acceptance testing with the exception of source horn antennas. All other equipment required for the performance testing will be provided by the contractor.

The frequencies shall be 100 MHz, 220 MHz, 1, 3, 5, 9, 12, 15, 18 and 35 GHz. Nominally H and V polarization will be tested.

A complete test report, including actual test data shall be submitted in hard copy as well as a soft copy format on ISO 9600 format CDROM in Adobe Acrobat or Rich Text Format (CDRL A005).

6.3.9 Source Positioner Mount

The source antenna positioner must be suspended from the structure of the chamber facility. The shielding support structure must be adequate to carry the load of the antennas and positioner and have the positioner operating in a vibration free mode. This structure will be tied to the Chamber facility structure such that it will support 500 lbs. The structure will be rigid enough to support 50 lbs on an 8 foot moment arm with a total

deflection of less than 1/4" The structure will not be subject to torsion around the z-axis more than 0.01 degree at 100 ft-lbs of force. This structure shall be supported from the ceiling and not require additional columns or supports from the mount to the floor.

The source positioner mount structure shall also contain, on the rear side, opposite the positioner mounting surface, a 19" rack mount cage of at least 10 rack units high, and 24" deep for the mounting of test and measurement equipment. A quad-duplex, RF filtered, 120VAC power outlet must also be mounted here.

6.3.10 Source Positioner Cable Ladder

Contractor shall supply a cable-tray or cable ladder arrangement to route cables (power, positioner, and RF) from the source back to the RF test equipment location. This cable ladder shall be at least 6 square inches in area, and have a surface that cables may be wire tied to. This cable ladder system should extend back to the RF Control area, as shown in Figure 1.

6.3.11 Penetrations and Attachments

The contractor shall make all the required penetrations in the anechoic chamber.

For work performed by subcontractors, the contractor shall either provide the attachment joints and brackets, or provide instructions to the subcontractor involved, in writing, to ensure that attachments do not degrade the shielding effectiveness of the anechoic chamber.

The tapered chamber will have (1) 4' x 7' single leaf door, lined with appropriate absorber material.

The chamber should provide the capability for cable from the quiet zone area to the outside of the chamber for the positioner equipment. A trough or guides embedded in the floor should provide routing of cables underneath absorber foam to ensure proper operations and electrical performance. Nominally, two 4" diameter penetrations should be provided with appropriate shielding hardware.

An appropriate penetration should also be provided at the top of the chamber, near the quiet zone, for the mounting of video and laser alignment heads and the proper routing of their cables at a later time.

6.4 ELECTRICAL POWER

6.4.1 General

The contractor shall provide all materials and labor to wire the Anechoic Chamber Facility for electrical power and lighting in accordance with National Electrical Safety Code (Para. 4.5.7). The work includes, but is not limited to furnishing and installing all wiring, conduits, wiring devices, lighting fixtures, switches, receptacles, filters., isolation transformers, distribution panels, breakers, fuses, together with any and all other equipment and accessories indicated, specified or necessary for a complete Anechoic Chamber Facility installation. This includes all installation wiring inside and outside of the Anechoic Chamber Facility.

Minimum wire size shall be number 12 AWG. All wiring shall be routed inside conduit.

The contractor shall assume that the facility electrical power will be provided as, 120/208 volt, 200 amp, 3-phase 4-wire WYE power.

6.4.2 Material and Workmanship

Complete wiring schematics of all electrical work along with the detailed engineering drawings certified by a registered electrical engineer for compliance to the National Electric Code (Para. 4.5.7), shall be submitted to the TM for approval (Para. 7.4). NRL will inspect all electrical work prior to the final connection to the supply power of the parent building.

6.4.3 Parent Building Supply Power

The contractor shall make all power connections inside and outside the Anechoic Chamber Facility up to the supply power of the parent building. The contractor shall notify the TM to have the government electrical trades make the final connection to the parent building supply power. The contractor should supply a main disconnect unit for the facility located on the exterior of the building at the power entry point.

6.4.4 Breaker Panels

The contractor shall supply the electrical distribution panels, circuit breakers, and all hardware required by the installation drawings to distribute electrical power and lighting power to the Anechoic Chamber Facility. The materials shall be installed and rated in accordance with the National Electrical Safety Code.

6.4.5 Identification of Circuits

The contractor shall identify and label all circuit breakers, switches, receptacles, with adhesive type labels. Labels shall be marked with panel numbers and circuit number.

6.4.6 Power Line Filter Units

The contractor shall provide power line filter units for operation on 60 Hz electric power lines with voltage and current ratings as indicated. These power line filters are only required to filter power used on equipment that connects into the chamber. The power line filter units shall be designed for the reduction of conducted RF energy, and shall provide an insertion loss from the load side of the filter to the supply side as specified herein, and tested in accordance with UL1283 (Para. 4.5.6). The filters shall provide at least 100 dB attenuation above 14 KHz.

The power line filter units shall be mounted on the exterior walls of the chamber facility. The location shall allow easy access for maintenance and repairs.

6.4.6.1 Markings for Filter Units, Enclosures and Individual Filters

Each filter enclosure, and individual filters shall be durably marked by the manufacturer with the rated current, rated voltage, operating frequency, nomenclature, number of phases for which it is designed, and with the manufacturer's name. The filter enclosure markings shall be visible without removing cover plates or disturbing the interior parts or wiring. The nameplates and warning labels shall be permanently attached.

In addition, the individual filter and the filter enclosures must be durably marked by the manufacturer with the following: "WARNING: Before working on circuits connected to power line filters, the circuits must be temporarily grounded to ensure discharge of capacitors.

6.4.6.2 Filter Unit Enclosure

The filter unit enclosures shall be NEMA Type 1 enclosures made of steel of not less than 14 gauges with welded seams. The filter unit enclosure shall meet the shielding effectiveness requirement of the overall shielded enclosure. The filter unit enclosures shall be galvanized or electroplated after fabrication and welding, or the enclosures shall be finished with a corrosion-inhibiting primer and two coats of finish enamel of the manufacturer's standard color. All unpainted surfaces shall be protected by highly conductive corrosion-resistant plating.

6.4.6.3 Internal Configuration

Each filter unit enclosure shall be divided into two compartments. The power input compartment shall be separated from the power output compartment by a solid steel RF barrier plate of the same gauge as the filter unit enclosure extending across the entire width of the enclosure. A ground stud shall be welded on each side of the RF barrier plate for power line safety ground connections.

The power input compartment shall house the individual filters and the input terminals of the filters. The power output compartment shall house the output terminals of the individual filter.

6.4.6.4 Electrical Requirements

The insertion loss of the individual filters shall be equal to or greater than 100 dB from 14 kHz to 50 GHz, at 10% to 100% of rated load when tested. The individual filters shall be designed with a passband for use with DC to 60 Hz power.

All individual filters shall be provided with bleeder resistors to drain the stored charge from the capacitors when power is shut off. Drainage of stored charge shall be in accordance with the National Electrical Code (Para. 4.5.7).

6.4.6.5 Temperature Rise

All components of the individual filters shall be suitable for continuous full load operation in an ambient temperature of 50°C.

6.4.7 Power Line Safety Ground and Neutral Conductor Connections

The power line safety ground wire shall be routed through the filter enclosure and connected to the ground stud welded on each side of the RF barrier plate. The safety ground wire shall be grounded to all conduit, lighting fixtures and receptacles per the National Electrical Safety Code (Para. 4.5.7).

The neutral conductor shall be filtered. The neutral conductor shall be attached to ground per the National Electrical Safety Code (Para. 4.5.7).

6.4.8 Conduit

The conduit, conduit fittings, junction boxes shall be galvanized rigid metal conduit conforming to NEMA standards (Para. 4.5.7). Conduit should be run within walls whenever possible.

6.4.9 Outlet Requirements

The 120/208 volt service shall be used to supply twenty (20) 120 volt, 20 amp, 1-phase circuits. Eight (8) of these circuits shall be provided for ceiling lights, including one for the anechoic chamber lighting. Eight (8) spare circuits shall be provided. Standard NEMA NEMA 5-20R configured straight blade receptacles shall be used. The circuits shall be wired to evenly distribute the 1-phase load on the 3-phase service. The circuits shall be routed along each wall in a raceway or through the walls in conduit, in accordance with National Electrical Codes. Power outlet boxes shall be located every six feet with 4 receptacles per box.

Two (2) 208 volt, 30 amp 3-phase 4-wire circuits shall be routed along each wall in conduit, or in a raceway, in accordance with National Electrical Codes. Four (4) standard NEMA L14-30R configured locking receptacles shall be evenly distributed in the chamber, preferably on each wall. The four receptacles shall be wired to evenly distribute the load between the two circuits.

Every 15 feet, a 120VAC, 30 Amp electrical outlet should be provided using an NEMA L5-30R twist lock connector.

No electric power outlets will be required inside of the tapered anechoic chamber.

6.4.10 Computer Network and Telephone Lines

Category 5e or better, twisted pair wire will be used to provide telephone and computer network capability to the chamber facility. Duplex RJ-45 outlets will be provided approximately every 8 linear feet for computer and telephone connections. Labeled, twisted pair wire will return back to a central location for NRL completion of wiring and installation of telephone and computer networking equipment. Contractor shall supply wall mounted rack mount cabinet with punch-down-blocks for telephone and network capability. Rack should include at least 6U, 12" deep space for user-installed equipment. Category 5e should be run inside of conduit.

6.5 LIGHTING

The contractor shall design and install the lighting system in accordance with National Electrical Safety Code (Para. 4.5.7). The contractor shall use both incandescent and fluorescent type lighting in the shielded enclosure, incandescent only in the anechoic chamber. Either system can be used independently of the other, while meeting full lighting requirements. The work includes supplying and installing all wiring, conduits, wiring devices, lighting fixtures, switches, receptacles, together with any and all other equipment and accessories indicated, specified or necessary for a complete Anechoic Chamber Facility lighting system installation. All wiring shall be routed inside conduit.

Fluorescent fixtures shall be provided such that they provide non-glare baffles, and each light should provide four tubes. Fluorescent lighting shall be wired to provide separate control of pairs of tubes so that reduced lighting may be used at times.

In the anechoic chamber, the contractor shall integrate the design and installation of the lighting system with the design and installation of the anechoic material. The contractor shall provide eight (8) 150W spotlight type lighting fixtures, equally distributed in the ceiling of the chamber work area. The design and installation shall be in accordance with National Electrical Codes (Para. 4.5.7). A light level of 200 LUX (underneath lights) and 10 LUX (between lights) shall be required and be verified by measurement.

A timer electronic timer system shall be installed to control the internal incandescent lighting inside of the anechoic chamber.

6.5.1 Lighting Control

The lighting in the chamber facility shall be controlled from two (2) locations. A switch shall be located inside the shielded enclosure near the west access door, and a second switch shall be located near the east access door. A separate switch near the west access door will be used for the anechoic chamber lighting.

All switches for the lighting system shall be mounted approximately 54" above the finished floor and located on the same side as the door handle is to be mounted on.

7. DOCUMENTATION AND TRAINING

All reports, schematics, drawings, manuals, etc, shall be provided in accordance with Exhibit A. All documents will be delivered on ISO 9660 complaint CDROM. Documents shall be provided in Adobe Acrobat format, as well as copies in the format of the native application that created them. Documents may be delivered by electronic means to the TM in addition to the requirement of the physical delivery of the documents. Additionally, all documents shall be provided at least one (1) printed copy, as specified in the CDRL list.

7.1 TRAINING

The contractor will provide to the government two orientation training sessions detailing the operation of the tapered anechoic chamber facility itself, and orientation tours of the facility. Each training sessions shall last 4 hours, and will be attended by 6 NRL employees. The contractor may assume that the attendees will already have experience operating anechoic chambers.

Training should cover at least the following items, although should not be limited to just these items:

Safety, operation of chamber specific components (doors, split-entry access, etc), proper use of equipment such as the chamber overhead crane/winch, HVAC systems, and explanation of proper operation of the facility in order to achieve the rated electrical performance.

7.2 MAINTENANCE AND USERS MANUAL

The contractor shall provide a user and maintenance manual for the shielded enclosure, doors, and all ancillary equipment needing routine maintenance. The manuals shall describe the procedure in detail to maintain the shielded enclosure and the entire facility under the contractor's warranty. All commercial warranty documentation will be provided as part of the maintenance and users manual package. The maintenance and users manuals shall be delivered at the time of chamber delivery. The manuals shall also include the standard user's manuals for all commercial components utilized in the construction of the facility, and their corresponding commercial warranty statements, if appropriate.

Reference CDRL A0007.

7.3 MONTHLY TECHNICAL AND MANAGEMENT STATUS REPORT

The contractor shall provide monthly status reports. The status report shall, at a minimum, indicate the schedule of the design and installation tasks, upcoming critical milestones and dates, pending construction or design issues, and possible future problem areas. Once onsite construction begins, it is assumed that a written status

report will be provided weekly in hardcopy or electronically to the TM. At the conclusion of each month, these weekly reports will be aggregated together.

Reference CDRL A0001.

7.4 PRELIMINARY DESIGN REVIEW (PDR) REPORTS

The Contractor shall provide the following reports during the PDR meeting – two weeks after contract award:

- (a) Preliminary construction schedule, (b) list of outline shop drawings, (c) summary of equipment design and performance objectives, (d) Outline of Quality Assurance Control Plan, and (e) Outline of Safety Plan. All reports shall be reviewed and approved by the Government. Final reports will be required for applicable reports.

Reference CDRL A0002.

7.5 CRITICAL DESIGN REVIEW (CDR) REPORTS

The Contractor shall provide the following reports during the CDR meeting – forty-five days after contract award:

- (a) Construction schedule, (b) outline shop drawings, (c) equipment design and performance objectives, (d) electrical circuit schematics, (e) a bill of material for all major components, (f) the Quality Assurance Control Plan, and (g) the Safety Plan. All reports shall be reviewed and approved by the Government. Final reports will be required for applicable reports.

Since the RF and electrical performance of the anechoic chamber facility is key, at the CDR a detailed plan for the testing and performance verification by the contractor shall be supplied. The Contractor shall provide detailed information about the final choice in materials, and evidence of their performance. The Contractor must supply a comprehensive test plan to verify all performance parameters of the chamber in the primary frequency range.

Reference CDRL A0003.

7.6 FINAL DRAWINGS AND DOCUMENTATION PACKAGE

The contractor shall provide the Technical Manager the as-built shop drawings and electrical drawings for the completed shielded enclosure and anechoic chamber within 30 days of completion of project.

7.7 FINAL ACCEPTANCE TEST REPORT

The contractor shall provide the TM the final acceptance test report, including all the original data, for the completed shielded enclosure. Pass or failure of the requirements shall be clearly stated and the proposed resolution of any unacceptable performance shall be presented.

8. Options

8.1 Chamber Construction Technique Option

The contractor shall provide an option to upgrade the chamber construction technique from a clamped, modular technique to a completely welded technique.

8.2 Installation of a Recessed Equipment Pit

The option to have the facility furnished with a recessed equipment pit is desired. This equipment pit allows the capability of putting azimuth-positioning equipment and linear slides below the “grade” of the tapered chamber floor, and outside of the quiet zone, improving the overall performance of the chamber once all of the equipment is installed and operating versus mounting the equipment on the floor.

Thus, this option would consist of providing a 11’ square, and 3’ deep recessed equipment pit below the grade of the A59 concrete floor surface. The measured distance from the bottom of the recessed equipment pit to the surface of the floor anechoic chamber foam should be 3’.

Construction of this equipment pit would require penetration of the A59 floor, removal of the material below the floor, and lining the resulting recessed equipment area with concrete to provide an area for equipment. The bottom of the recessed equipment pit should be engineered as a foundation able to support 5,000 pounds, including positioning equipment, turntable apparatus, testing fixtures, antennas, and personnel.

Two 4” diameter cable ducts with pull ropes should be supplied that run from the pit to below and outside of the chamber facility and terminate in the RF test equipment vicinity to provide cable access to equipment located within the recessed area. Running the conduit out of the pit and running it along the floor of the chamber, under the anechoic chamber absorber foam, and out the wall of the chamber is an acceptable alternative, if it can be shown that the electrical performance of the chamber will not be compromised.

8.3 Network Analyzer Equipment

This option shall include the procurement and delivery of an Agilent 8530B Receiver and associated microwave/millimeter-wave sources.

The network analyzer equipment options should assume:

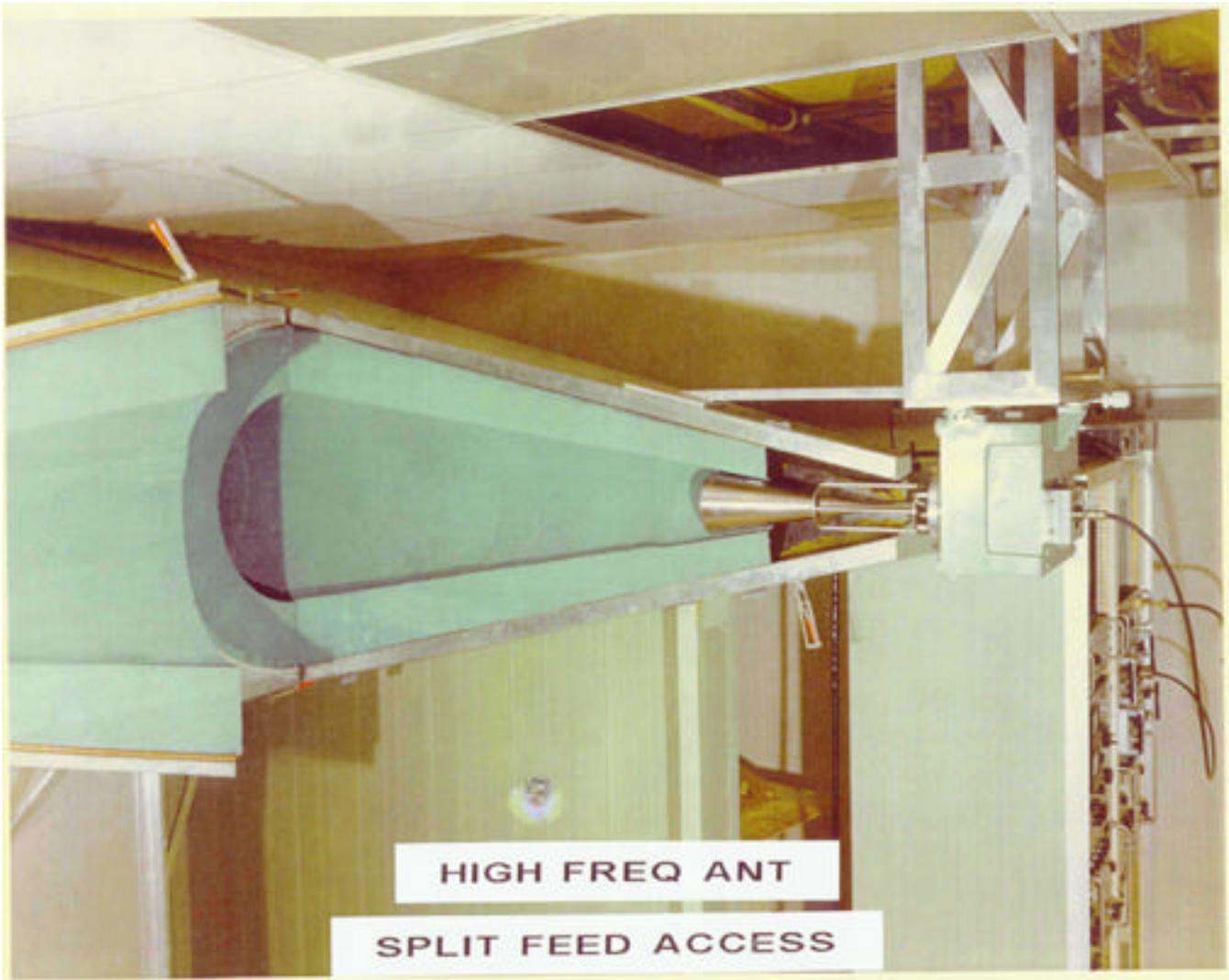
- 85301 – “B” version
- 83650B 10 MHz- 50 GHz source synthesizer (options 004, 008)
- 85320A Test Mixer module
- 85320A Reference mixer module
- 85309A LO/IF Unit
- 83623B LO Source (options 004, 008)
- 8530A Main control unit

Console equipment shall be delivered in rack unit

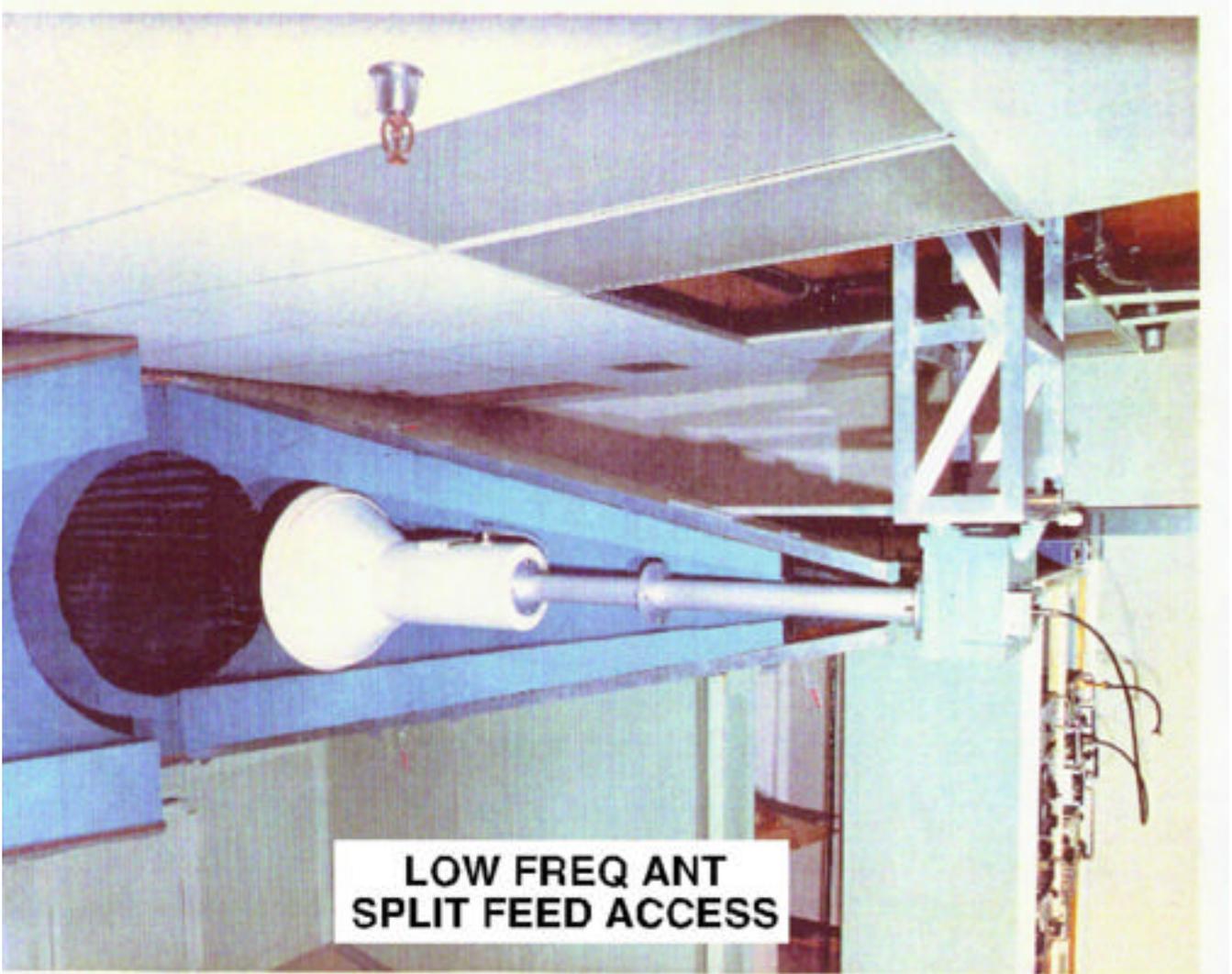
Remote equipment shall be installed in source antenna rack space

Low-loss high-performance cables shall be supplied to fit the final chamber dimensions.

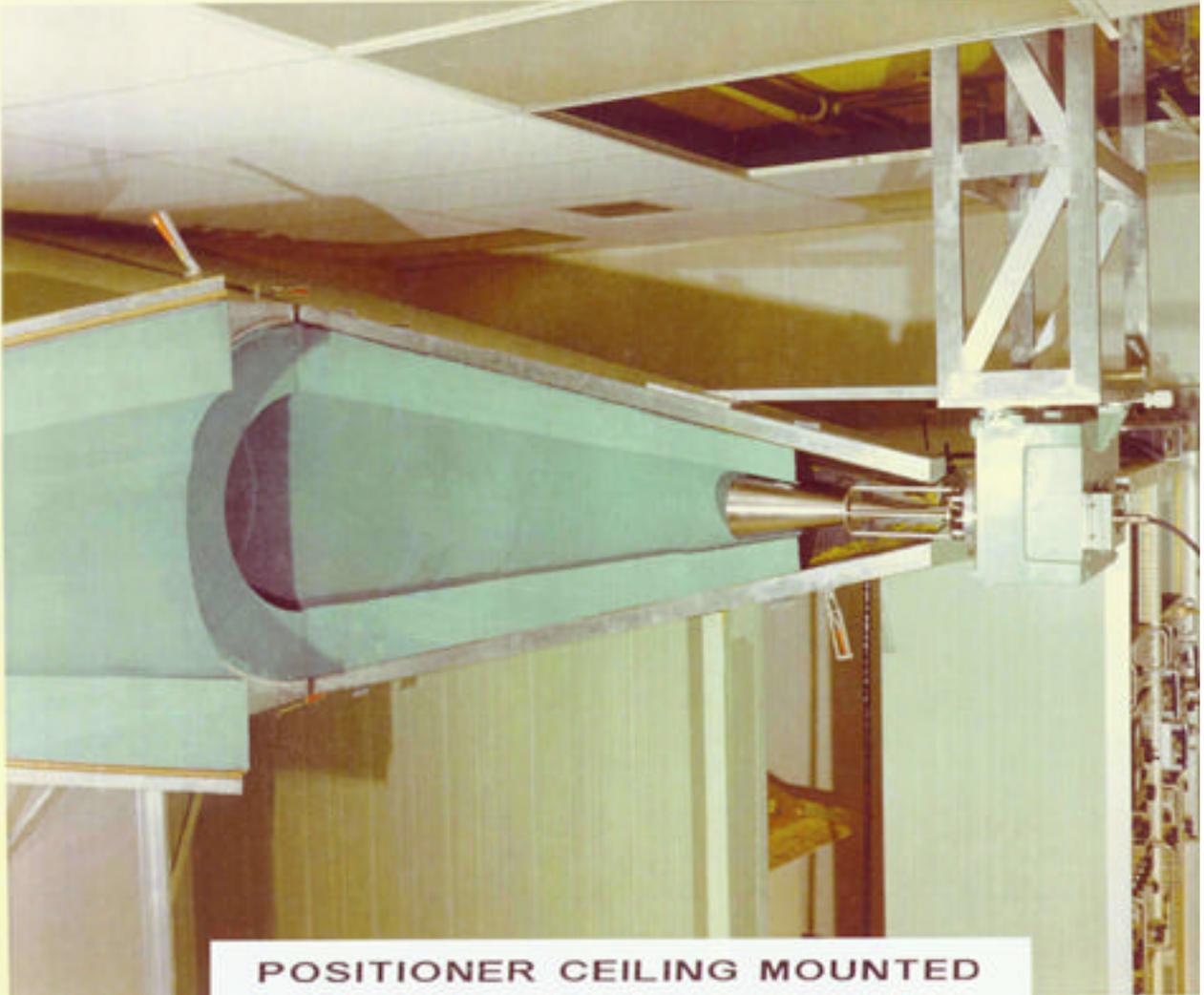
EXHIBIT A. PHOTOS OF EXISTING CHAMBER



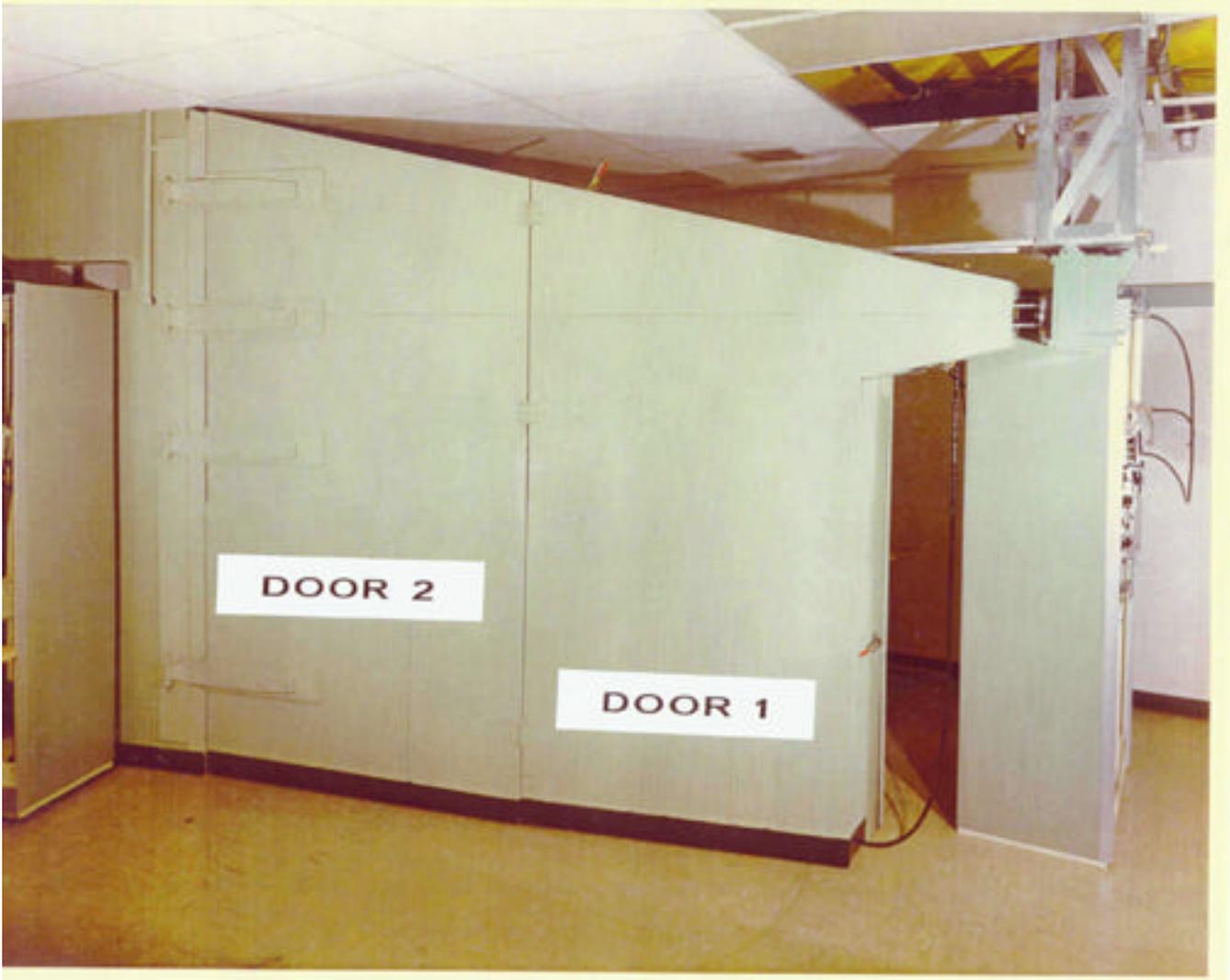
A1. HIGH FREQUENCY ANT - SPLIT FEED ACCESS



A2. LOW FREQ ANT - SPLIT FEED ACCESS



A3. SOURCE POSITIONER - CEILING MOUNTED



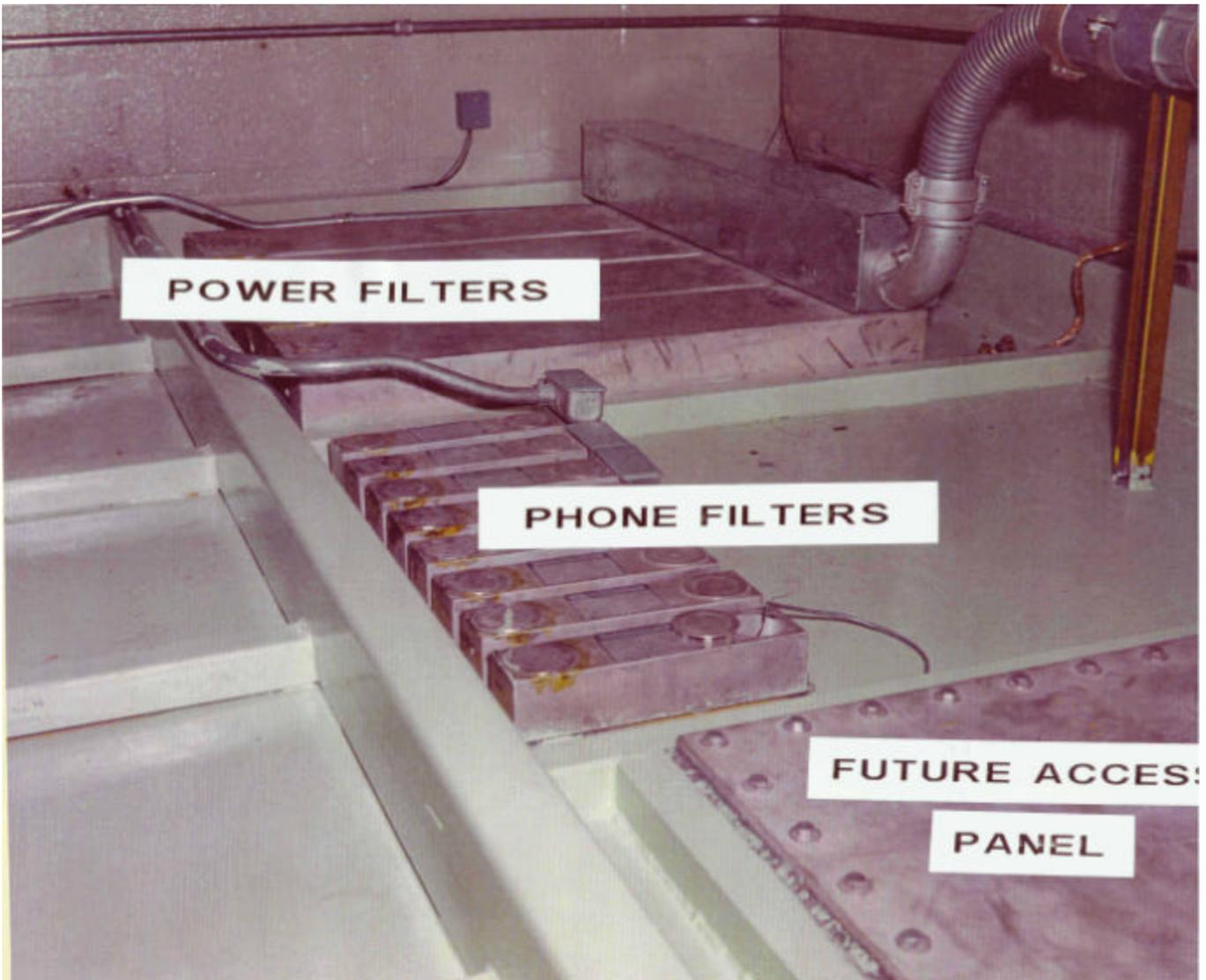
A4. SPLIT FEED ACCESS DOORS 1 AND 2



A5. WHEEL ON SPLIT FEED ACCESS DOOR



A6. LADDER TO LIGHTED STORAGE AREA ON CHAMBER CEILING



A7. POWER AND PHONE FILTERS

CONTRACT DATA REQUIREMENTS LIST

(2 Data Items)

Form Approved
OMB No. 0704-0188

The public reporting burden for this collection of information is estimated to average 220 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to the above address. Send completed form to the Government Issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO. 0001	B. EXHIBIT A	C. CATEGORY: TDP _____ TM _____ OTHER _____
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D. SYSTEM/ITEM	E. CONTRACT/PR NO. N00173-02-	F. CONTRACTOR
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1. DATA ITEM NO. A001	2. TITLE OF DATA ITEM Monthly Technical and Management Status Report	3. SUBTITLE
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4. AUTHORITY (Data Acquisition Document No.) N/A	5. CONTRACT REFERENCE SOW Paragraph 7.3	6. REQUIRING OFFICE NRL Code 8125
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7. DD 250 REQ LT	9. DIST STATEMENT REQUIRED N/A	10. FREQUENCY MTHLY	12. DATE OF FIRST SUBMISSION 30DAC	14. DISTRIBUTION			
8. APP CODE N/A		11. AS OF DATE 0	13. DATE OF SUBSEQUENT SUBMISSION EOM	a. ADDRESSEE	b. COPIES		
					Draft	Final	

16. REMARKS The status report shall, at a minimum, indicate the schedule of the design and installation tasks, upcoming critical milestones and dates, pending construction or design issues, and possible future problem areas. Report should be submitted in Adobe Acrobat format via ISO 9660 standard CDROM, as well as hard-copy printout. CAD and other drawings should be submitted in DWG format whenever possible, Adobe Acrobat versions, as well as size E printouts.	TM	0	2	0
	15. TOTAL →	0	2	0

17. PRICE GROUP
18. ESTIMATED TOTAL PRICE

1. DATA ITEM NO. A002	2. TITLE OF DATA ITEM Preliminary Design Report (PDR) Reports	3. SUBTITLE
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4. AUTHORITY (Data Acquisition Document No.) N/A	5. CONTRACT REFERENCE SOW Paragraph 7.4	6. REQUIRING OFFICE NRL Code 8125
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7. DD 250 REQ LT	9. DIST STATEMENT REQUIRED N/A	10. FREQUENCY 1 TIME	12. DATE OF FIRST SUBMISSION	14. DISTRIBUTION			
8. APP CODE N/A		11. AS OF DATE SEE BLK 16	13. DATE OF SUBSEQUENT SUBMISSION EOC	a. ADDRESSEE	b. COPIES		
					Draft	Final	

16. REMARKS The Contractor shall provide the following information as part of the PDR package, available at the Preliminary Design Review : (a) Preliminary construction schedule, (b) list of outline shop drawings, (c) summary of equipment design and performance objectives, (d) Outline of Quality Assurance Control Plan, and (e) Outline of Safety Plan. All reports shall be reviewed and approved by the Government. Final reports will be required for applicable reports. Report should be submitted in Adobe Acrobat format via ISO 9660 standard CDROM, as well as hard-copy printout. CAD and other drawings should be submitted in DWG format whenever possible, Adobe Acrobat versions, as well as size E printouts. The PDR documents shall be delivered within two weeks of contract award at the PDR.	TM	0	2	0
	15. TOTAL →	0	2	0

17. PRICE GROUP
18. ESTIMATED TOTAL PRICE

G. PREPARED BY NRL CODE 8125	H. DATE 3 JULY 2002	I. APPROVED BY	J. DATE
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