CLEANROOM CERTIFICATION AND ACCEPTANCE PROCEDURES

PART I--GENERAL

1.1 Work Included [Edit this specification to eliminate tests not required. Place tests in the desired sequence of performance]

A. This section provides the services required by the NEBB Certified Cleanroom Performance Testing (CPT) Firm hereinafter referred to as the NEBB CPT Firm, to measure and record the cleanroom conditions and resolve all nonconforming areas prior to attesting that the cleanroom is complete and ready for Owner's testing and occupancy.

B. At completion of the certification period, the Owner may engage the services of an independent quality assurance testing and certifying agency to perform random spot checks of all data collected during the NEBB CPT Firm's certifying period. This quality assurance agency, if used, will act only on behalf of the Owner to ensure that certification measurements and data are within industry tolerances and will verify that space conditions and system operations have not changed.

C. The NEBB CPT Firm shall perform the following (checked off) tests described below.

1. Airflow Velocity and Uniformity Tests.
2. HEPA Filter Installation Leak Tests.
3. Room Particle Count Tests.
5. Temperature and Humidity Uniformity Tests.
7. Light Level and Uniformity Tests.
D. NEW CONSTRUCTION (Optional): the NEBB CPT Supervisor shall visit the job site a minimum of once every [_____] weeks during the period that construction work is being performed on the finished cleanroom to review and make inspections of the cleanroom HVAC systems. The cost of the time and associated expense for these visits shall be included in the proposal.

E. HEPA/ULPA Filter Repair and Replacement: If defective ceiling filters are identified during the course of the certification testing, the NEBB CPT Firm shall immediately notify the Owner, and repair or replacement shall be performed at the direction of the Owner and at mutually agreed fees or costs.

1.2 Related Sections

A. This section shall be used in conjunction with the following other specifications and related Contract Documents to establish the total requirements for the referenced cleanroom testing and certification.

1. Section _____

2. Section _____

3. Section _____

4. Division 1--General Requirements

5. Cleanroom Drawings and specifications.

CAUTION! Use of this section without including all of the previously listed items will result in omission of basic requirements.

B. In the event of conflict regarding requirements for the referenced cleanroom testing and certification between this section and any other section, the provisions of this section shall govern.

1.3 References

A. Federal Standard 209E, Airborne Particulate Cleanliness Class for Cleanrooms and Clean Zones:

1. General Services Administration

Specifications Activity

Printed Materials Supply

Bldg. 197, Naval Weapons Plant
B. IES-RP-CC-006.2-1993, Testing Cleanrooms and IES-RP-CC-001.3-1993, HEPA and ULPA Filters:

1. Institute of Environmental Sciences

940 East Northwest Highway

Mount Prospect, IL 60056


1. National Environmental Balancing Bureau (NEBB)

8575 Grovemont Circle

Gaithersburg, MD 20877

1.4 System Description

A. Definitions

1. As-Built Facility: Cleanroom which is complete and operating, with all services connected and functioning, but which has no production equipment or operating personnel.

2. At-Rest Facility: Cleanroom which is complete and has production equipment installed and operating, but which has no personnel.

3. Operating Facility: Cleanroom in normal operation, including production equipment and personnel.


6. Quality Assurance Agency: The Owner's cleanroom quality assurance certifying firm or agency.

B. Class of clean areas shall be as listed below:
1.5 Warranty

A. The service to be furnished by the NEBB CPT Firm shall be considered complete and accepted when the Cleanroom Certification Test Report has been approved by the Owner.

1.6 Quality Assurance

A. All cleanroom air systems shall be tested and certified by a nationally certified firm specializing in cleanroom certification. The NEBB CPT Firm shall review the work of construction trades required to complete construction of the cleanrooms in accordance with the Construction Documents (see 1.01-D).

B. NEBB CPT Firms shall have been in business a minimum of [_____] years specializing in cleanroom testing and certifying work. A list shall be available upon request, of projects similar in size, complexity, and cleanliness classification similar to this project that the firm has completed. Include the project name, description of mechanical systems, range of services provided, and the name and phone number of the design consultant and the owner who were responsible for final acceptance of the service.

C. The NEBB CPT Supervisor shall supervise all field technicians assigned to complete the testing and certifying of the work, and shall be responsible for all on-site testing and data acquisition.

D. All NEBB CPT Firm Technicians shall have worked in cleanroom certification procedures on at least one other similar project, and shall perform field work under supervision of the NEBB CPT Supervisor.

E. A sample of all field data reports, charts, and forms used by the NEBB CPT Firm shall be submitted with the proposal. In addition, a sample test report of a similar project shall be available for inspection by the [Owner] [Architect/Engineer] to verify expertise in data collection, interpretation, and documentation.


G. No certification shall be initiated without notifying the Owner's representative.
1.7 Submittals

A. Submittals shall be provided in accordance with Section [_____]--Submittals, and the requirements of this section.

B. The following are required with the proposal:

1. Qualifications of the NEBB CPT Supervisor and the NEBB CPT Firm.

2. Documentation that the NEBB CPT Firm has met all qualification requirements of NEBB.

3. Written presentation outlining the testing and certification procedures and sequence to be performed.

4. Description of all instrumentation and test equipment to be used, as well as calibration documentation.

5. Samples of all field reports, charts, and forms proposed to document the field measured conditions.

C. After completion and acceptance of all required tests, the NEBB CPT Firm shall compile the test and certification data and shall submit copies of the completed report for review and approval. The report submitted shall include signatures and seal of the NEBB CPT Supervisor.

D. Contents of completed report shall be in accordance with the NEBB Procedural Standards for Certified Testing of Cleanrooms. The Cleanroom Certification report shall include, but is not limited to the following items:

1. Report: Tabulate all test data on 8-1/2 inch by 11 inch sheets bound in a report. Identify all test data by grid location. Grids shall be reviewed with the Owner prior to award of Contract.

2. Drawings: Include prints of the Cleanroom Floor Plans and Reflected Ceiling Plans made from the contract drawings with testing and certification locations shown on the drawings. (Sample Test Report Forms may be found in Chapter 13--Sample Test Report Forms in the NEBB Procedural Standards for Certified Testing of Cleanrooms).

3. Test Equipment: Furnish a complete list of all test equipment used in performing the work with serial numbers and verification of the latest calibration dates. All equipment will be reviewed with the Owner prior to commencement of certification test work.
4. Furnish in the report, a written statement, signed by the NEBB CPT Supervisor, stating that all work has been performed in accordance with these specifications unless specifically noted otherwise in the report.

5. Include a description of all tests performed, including the purpose, instrumentation, procedures, results, and analysis of the data. Data shall be presented and graphically displayed on NEBB forms to permit full understanding of all tests by the Owner.

6. [_____] copies of the completed Cleanroom Certification Report shall be submitted for the Owner's review and acceptance.

1.8 Job Conditions

A. Certification shall not proceed until all other work on the cleanroom has been completed and the commencement of certification work has been approved.

B. Condition of Cleanrooms Prior to Testing:

1. The HVAC system installation for the cleanroom, including all of the exhaust systems and makeup air systems associated with the cleanroom operation, shall have been completed, including all air and hydronic testing, adjusting, and balancing work, and a TAB report submitted.

2. All floor tiles shall be in place, and all wall and ceiling penetrations sealed to airflow.

PART 2--PRODUCTS [Edit to eliminate items not required]

2.1 Materials

A. The NEBB CPT Firm shall supply all [materials], tools, [equipment], and instrumentation required to perform the cleanroom system testing and certification as described in this section. Cleanroom garments not included.

B. Once the cleanroom has been installed (select one of the following): only [a polystyrene latex (PSL) aerosol], [Di-Ethyl-Hexyl-Sebecate (DEHS) aerosol (C26H50O4)], [DOP aerosol], [______________________] shall be used for challenge of [HEPA] [ULPA] filters.

2.2 Instrumentation

A. Only approved state-of-the-art test equipment and instrumentation shall be used in the certification test procedures as described in Chapter 14--Equipment and Instrumentation of the NEBB Procedural Standards for Certified Testing of Cleanrooms, Second Edition--1996.
B. The approved test instrumentation shall be used as described in the certification test procedures found in the NEBB *Procedural Standards for Certified Testing of Cleanrooms, Second Edition--1996*.

PART 3--EXECUTION

3.1 Preparation

A. The NEBB CPT Firm shall supervise and conduct all tests in the presence of the Owner's representative.

B. The as-built cleanroom certification tests shall be performed after the HVAC TAB work has been completed and the Owner's representative is satisfied that the installation is ready for certification testing. Final clean down [and commissioning procedures] also shall be completed.

C. All cleanroom recirculation fans, makeup air fans, process fume exhaust systems, and automatic control loops shall be in operation during tests. All mechanical systems and all fans related to cleanroom systems shall be verified to be operating as specified and delivering design airflow.

D. Tests described below are not identified necessarily in their proper sequence. The sequence of test procedures shall be as stated in the Proposal.

3.2 Field Testing and Certifying Procedures

A. Airflow Velocity and Uniformity Tests

Follow the cleanroom certification test procedures found in Chapter 5--Airflow Test Procedures of the NEBB *Procedural Standards for Certified Testing of Cleanrooms, Second Edition--1996*.

B. HEPA Filter Installation Leak Tests.


C. Room Particle Count Tests

Follow the cleanroom certification test procedures found in Chapter 7--Room Cleanliness Classification Testing of the NEBB *Procedural Standards for Certified Testing of Cleanrooms, Second Edition--1996*.

D. Enclosure Pressurization Tests

E. Temperature and Humidity Uniformity Tests


F. Sound and Vibration Tests


G. Light Level and Uniformity Tests


H. Recovery Tests


I. Conductivity Test


J. Particle Fallout Count Tests

Follow the cleanroom certification test procedures found in Section 12.2--Particle Fallout Count Test of Chapter 12 of the NEBB Procedural Standards for Certified Testing of Cleanrooms, Second Edition--1996.

K. Electrostatic Tests
Follow the cleanroom certification test procedures found in Section 12.4--

3.3 Acceptance Criteria

A. Verification Procedures

1. If specified, the NEBB CPT Firm shall demonstrate to the Owner's representative, the test instrumentation to be used and the certification performance test procedures to be followed.

2. At the completion of all certification performance tests, the NEBB CPT Supervisor shall review all certification test data with the Owner's representatives and establish the base operating condition of cleanrooms and clean spaces.

B. Documentation

1. The NEBB CPT Supervisor shall review the certification test report data for compliance after each test, and then sign/stamp the final reports for submittal to the Owner.

2. The NEBB CPT Firm shall deliver [_____] complete sets of all certification [data] [logs] in bound form to the Owner.