



eProjects WORK ORDER NO.
N40080-FY-1327210

REQUEST FOR PROPOSAL
(Revised FINAL Submission)

Replace Fan Coil Units, Building 222

At

Naval Research Laboratory

Washington, D.C.

PREPARED BY:

JACOBS
1100 N. Glebe Road
Suite 500
Arlington, Virginia 22201

(A/E Contract N40080-11-D-0491)

REQUEST FOR PROPOSAL PREPARED BY:

JACOBS™

Architectural

Mechanical/Plumbing
Electrical

Heather Spiller, P.E.
Submitted By: Jacobs

A handwritten signature in black ink that reads "Heather M. Spiller".

Signature

April 17, 2015

Date

Jay Blumenkrantz, P.E.
RFP Accepted by CI Team Lead/PMEB

Signature

Date

Kamal El-Ali
Design Manager

Signature

Date



REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210

April 17, 2015

SMALL PROJECT TABLE OF CONTENTS

- Part 1 Proposal Forms and Documents**
 - Part 2 General Requirements**
 - Attachment A: Project-Specific General Requirements**
 - Part 3 Statement of Work / Project Program**
 - Part 4 Minimum Materials, Engineering and Construction Requirements**
 - Part 5 Prescriptive Technical Specifications**
 - Part 6 Attachments**
-

Preface

This Request for Proposal (RFP) consists of six parts.

Part 1 contains typical contractual forms, procedures, bidding instructions, bond information, clauses and wage decisions.

Part 2 contains general contract administrative and execution requirements including, but not limited to safety, design criteria & process, quality control, security, schedule, invoicing, temporary facilities, and design and construction oversight processes.

Part 2, Attachment A, contains project-specific general requirements that may either modify and/or supplement the corresponding standard paragraphs in the Part 2 "General Requirements" section.

Part 3 lists the project requirements, specific scope items, and expected quality level above and beyond those outlined in Part 4.

Part 4 contains Performance Specifications and minimum quality requirements.

Part 5, prescriptive specifications, is typically not used in this Small Project format.

Part 6 contains background project information, references, and other project-specific requirements.

PART 1 – PROPOSAL FORMS & DOCUMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 20, 2015

PART 1 - PROPOSAL FORMS & DOCUMENTS

This section to be provided by NAVFAC Washington.

PART 1 – PROPOSAL FORMS & DOCUMENTS
REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 20, 2015

THIS IS INTENTIONALLY LEFT BLANK

PART 2 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

Part 2 General Requirements

PART 2

GENERAL REQUIREMENTS

4/14

1.0 DEFINITIONS

As used throughout the contract, the following terms shall have the meaning set forth below:

Contracting Officer (KO): The individual designated to administer the contract. Throughout this contract this individual will be responsible and possess the authority to act on behalf of the Government with respect to the specific contract.

Contracting Officer Representative (COR): The individual designated by the Contracting Officer as the authorized representative of the Contracting Officer. The COR is responsible for monitoring performance and technical management of the effort required and should be contacted regarding questions or problems of a technical nature.

Contractor: The term Contractor refers to both the prime Contractor and subcontractors, including the Designer of Record.

Designer of Record (DOR): Licensed architect/engineer working as subcontractor to or partner with prime Contractor who provides design for this contract.

Quality Control (QC): Contractor's system to control the quality of design, material, equipment and construction.

Quality Assurance (QA) Program: Government's program to evaluate the effectiveness of the Contractor's quality control. The Government's QA Program is not a substitute for the Contractor's QC Program.

Federal Holidays: New Year's Day, Martin Luther King Jr. Day, President's Day, Memorial Day, Independence Day; Labor Day, Columbus Day, Veterans Day, Thanksgiving Day, and Christmas Day.

Contract: Contract or task order.

2.0 ORDER OF PRECEDENCE

NFAS Clause 5252.236-9312. In the event of conflict or inconsistency between any of the below described portions of the confirmed contract, precedence shall be given in the following order:

- a. Any portions of the proposal or final design that exceed the requirements of the solicitation..
 - 1) Any portion of the proposal that exceeds the final design.
 - 2) Any portion of the final design that exceeds the proposal.
 - 3) Where portions within either the proposal or the final design conflict, the portion that most exceeds the requirements of the solicitation has precedence.
- b. The requirements of the solicitation, in descending order of precedence:

PART 2 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

- 1) Standard Form 1442, Price Schedule, and Davis Bacon wage rates.
- 2) Part 1 - Contract Clauses.
- 3) Part 2 - General Requirements.
- 4) Part 3 - Statement of Work/Project Program Requirements.
- 5) Part 6 - Attachments (excluding Concept Drawings).
- 6) Part 5 - Prescriptive Specifications, exclusive of performance specifications.
- 7) Part 4 - Minimum Materials, Engineering and Construction Requirements, exclusive of prescriptive specifications.
- 8) Part 6 - Attachments (including Concept Drawings).

3.0 POST AWARD KICKOFF MEETING (PAK)

Prior to commencement of design, and within 21 calendar days of award, meet with representatives of the Contracting Officer, installation and client to present the concept design for discussion and acceptance. The project team will develop a mutual understanding relative to the approved proposal, safety program, environmental permits and requirements, quality control procedures, and design and construction schedule. During the meeting, Contractor shall propose and gain acceptance for any critical path work activities requiring advance submittal and approval. If the contract includes work on any fire protection system, including fire alarm and mass notification systems, the Contractor and the appropriate DOR shall meet with the NAVFAC Fire Protection Engineer (FPE) to establish clear expectations of fire protection requirements of the project.

The Contractor's key personnel shall attend at the expense of the Contractor. Key personnel are defined as the Project Manager, Superintendent, CQC representative(s), DOR, major subcontractors and specialized supplementary personnel.

The PAK includes partnering, held during normal work hours with the non-labor -related costs shared by both parties. Partnering is a structured process, as well as philosophy of doing business with Contractors and clients that recognizes common goals through communication and teamwork. It helps create an environment where trust and teamwork prevent disputes, foster good working relationships to everyone's benefit, and facilitate the completion of a successful contract. If included in Attachment A, a Performance Assessment Plan that provides monthly performance feedback to the Contractor, will be discussed during the partnering session.

Key personnel will meet to identify strategies to ensure the project is carried to expeditious closure and turnover to the Client. Start the turnover process at the PAK Meeting utilizing the NAVFAC Red Zone (NRZ) Checklist and convene the Facility Turnover Meetings once the project has reached approximately 75% completion or 3 to 6 months prior to Beneficial Occupancy Date (BOD), whichever comes first. The Contracting Officer's Representative will lead the meetings and guide the discussions based on an agenda provided by the Government. The Facility Turnover effort shall fill in the NRZ Checklist including Contractor, Client, and NAVFAC Checklist Items and assign a person to be responsible for each item and a due date. The Contracting Officer's Representative will facilitate the assignment of responsibilities and fill out the NRZ Checklist. The Contracting Officer's Representative shall develop a Plan of Action and Milestones (POAM) for the completion of all Contractor, Client, and NAVFAC Checklist items.

PART 2 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

4.0 DESIGN

Design is the work necessary to ensure functionality, quality, and safety for critical facets of the project. Special coordination requirements, such as for phone, LAN and cable, are included in Attachment A.

- a. Provide work in compliance with the following design standards and codes, as a minimum. Government standards listed in this RFP take precedence over industry standards.
- b. This RFP references published standards, the titles of which can be found in the *Unified Master Reference List (UMRL)* on the Whole Building Design Guide at the Unified Facilities Guide Specification (UFGS) Website. The publications referenced form a part of this specification to the extent referenced.

The advisory provisions of all codes, requirements, and standards shall be mandatory; substitute words such as "must" or "required" for words such as "shall", "should", "may", or "recommended," wherever they appear. The results of these wording substitutions incorporate these code and standard statements as requirements. Reference to the "authority having jurisdiction" shall be interpreted to mean Contracting Officer or Contracting Officer Representative. Comply with the required and advisory portions of the current edition of the standard at the time of contract solicitation.

The following list of codes and standards is not comprehensive and is augmented by other codes and standards referenced and cross-referenced in the RFP. Refer to Parts 3 and 4 for specific requirements within other UFC's.

- 1) UFC 1-200-01, *General Building Requirements*
 - 2) UFC 1-300-08, *Criteria for Transfer and Acceptance of Military Real Property*
 - 3) UFC 1-300-09N, *Design Procedures*
 - 4) UFC 3-560-01, *Electrical Safety, O&M*
 - 5) UFC 3-600-01, *Fire Protection Engineering for Facilities*
 - 6) UFC 3-600-10N, *Fire Protection Engineering*
 - 7) UFC 3-800-10N, *Environmental Engineering for Facility Construction*
 - 8) UFC 4-010-01, *DoD Minimum Antiterrorism Standards for Buildings*
 - 9) UFC 4-020-01, *Security Engineering: Facilities Planning Manual*
- c. Part 3 contains the project description, functional and performance requirements, scope items, and expected quality levels that exceed Part 4. Part 4 identifies design criteria, verification requirements, and performance and quality requirements of products. See "Order of Precedence" paragraph in Part 2 for relationships between all parts of this RFP.
 - d. Provide professional registration and design signing and stamping requirements per requirements of UFC 1-300-09N, *Design Procedures*.

PART 2 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

- e. See Attachment A for project-specific submittal requirements.
- f. Meet sustainability requirements per UFC 1-200-02 High Performance and Sustainable Building requirements and UFGS section 01 33 29.05 20 *Sustainability Requirements for Design Build*.

5.0 FIRE PROTECTION AND LIFE SAFETY REQUIREMENTS

Work shall comply with applicable criteria identified herein and Attachment A. Any project including work on means of egress, fire rated elements, Fire Suppression, Mass Notification, or Fire Alarm Systems shall require the services of a Registered Fire Protection Engineer per Attachment A.

- a. Final Life Safety/Fire Protection Certification Documentation: Unless otherwise specified in Attachment A, provide certification that all life safety and fire protection features and systems have been installed in accordance with applicable criteria, the contract documents, approved submittals, and manufacturer's requirements. This certification shall summarize all life safety and fire protection features.

6.0 QUALITY CONTROL

Maintain quality control for and inspect all work under the contract. The DOR, as a member of the Contractor QC organization, shall remain directly involved during the construction process. For certain projects, the Quality Control Manager, Superintendent, and Site Safety and Health Officer may be combined - see paragraphs 6 and 34 in Attachment A. Further QC requirements are identified in Attachment A.

- a. Submit a QC Plan for Government review and acceptance. The QC plan shall include the following:
 - 1) NAMES, QUALIFICATIONS and RESPONSIBILITIES: For each person in the QC organization (design and construction).
 - 2) OUTSIDE ORGANIZATIONS: Outside organizations, including architectural and consulting engineering firms and a description of the services these firms will provide.
 - 3) INITIAL SUBMITTAL REGISTER (DESIGN & CONSTRUCTION): Include submittal reviewer, estimated date of delivery, and identify which design submittals require Government approval prior to construction, and which construction submittals require DOR or Government approval prior to construction.
 - 4) TESTING LABORATORIES: Accredited laboratories as applicable.
 - 5) TESTING PLAN AND LOG: Tests required, referenced by specification paragraph number requiring the test, frequency, and person responsible for each test.
 - 6) LIST OF DEFINABLE FEATURES: A Definable Feature of Work (DFOW) is a task, which is separate and distinct from other tasks, and has the same control requirements and work crews.
 - 7) COMMUNICATION PLAN: Provide a plan for key decisions and possible problems the

PART 2 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

Contractor and Government may encounter during the design phase of the project. Communication Plan shall indicate the frequency of design meetings and what information is covered in those meetings, key design decision points tied to the Network Analysis Schedule and how the DOR plans to include the Government in those decisions, peer review procedures, interdisciplinary coordination, design review procedures, and comment resolution.

b. QC Manager Responsibilities:

1) Participate in the Post Award Kick-off, Partnering, Design Development and Coordination Meetings and Production Meetings.

2) Ensure that no construction begins before the DOR has signed and stamped the design for that segment of work, and design and construction submittals are approved as required in Attachment A and the QC Plan.

3) Immediately stop any work that does not comply with contract plans and specifications, and direct the removal and replacement of any defective work.

4) Prepare QC Reports.

5) Hold biweekly QC meetings with DOR, Superintendent and Government technical team; participation shall be suitable for the phase of work.

6) Ensure that safety inspections are performed. Attend weekly Toolbox meetings.

7) Maintain submittal log.

8) Maintain updated as-built drawings on site.

9) Maintain testing plan and log. Ensure that all testing is performed per contract.

10) Maintain deficiency log on site, noting dates deficiency identified, and date corrected.

11) Certify and sign statement on each invoice that all work to be paid under the invoice has been completed in accordance with contract requirements.

12) Perform Punch-out and Pre-final inspections, and participate in Final Inspections. Establish list of deficiencies; correct prior to the Final inspection.

13) Ensure that all required keys, operation and maintenance manuals, warranty certificates, and the As-built drawings are submitted to the Contracting Officer.

14) If Commissioning is part of work, engage Commissioning Authority (CxA), coordinate their oversight of Contractor's work and verify CxA's performance in accordance with UFGS section 01 45 00.05 20.

c. Use the Three Phases of Control process for construction QC.

1) Preparatory Phase: Review all applicable documents for compliance with all applicable laws, codes, regulations, and the requirements of the contract, including contract drawings and specifications. Determine requirements for testing and certification. Review submittal approvals for materials, equipment, shop drawings, and applicable methods of construction and installation. Include all Preparatory Phase items in the QC Report.

PART 2 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222

WORK ORDER NO. 1327210

NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

APRIL 17, 2015

- 2) Initial Phase: Observe and inspect the initial portion of the work performed under a DFO to establish the quality of the workmanship, resolve conflicts in construction, ensure that testing is done and certified as required, and to check all work procedures to ascertain the work is in conformance with required safety requirements. Record and report nonconforming work and work not of acceptable quality and requiring correction or rework. Include all Initial Phase items, along with initial phase checklist and, in the QC Report.
 - 3) Follow-Up Phase: Occurs at the completion of each DFO. Ensure the work is in compliance with contract requirements, quality of workmanship for all work is maintained, and all work performed meets safety requirements. Include all Follow-Up Phase items, including date, in the QC Report.
- d. The QC Manager must possess a current certificate showing successful completion of the NAVFAC Contractor Quality Management (CQM) Training.

7.0 SUBMITTAL PROCESS

Provide to the Government submittals as listed. See Paragraph 4, DESIGN, and Attachment A for specific design and construction submittal format and approval and surveillance requirements. Design drawings may be prepared more like shop drawings to minimize construction submittals after final designs are approved. Therefore, the Contractor is encouraged to prepare and submit with the design drawings, appropriate connection, fabrication, layout, and product specific drawings.

- a. QC Plan, prior to Design/Construction (may be phased).
- b. Submittal requirements: Requirements should be a list of submittals identified and expected submission dates.
- c. Design and construction submittals, prior to construction, approved in accordance with (IAW) QC Plan, the DOR or QC Specialist is the approving authority for submittals unless otherwise indicated in Attachment A.
- d. Sustainability Action Plan in accordance with 01 33 29.05 20 Sustainability Requirements
- e. DOR-approved design and construction submittals identified in Attachment A for Government surveillance (typically Fire Protection system and Life Safety submittals). Stamp the submittals "FOR SURVEILLANCE ONLY." Submit Surveillance submittals to the Government prior to starting work for that item. Submittals required for surveillance will be returned only if corrective actions are required.
- f. Material Safety Data Sheets (MSDS) as applicable.
- g. Design and Construction Schedule: Provide detailed design schedule and preliminary construction schedule, due prior to PAK
- h. Environmental Protection Plan, prior to start of the work.
- i. Construction Site Plan: Prior to the start of work, submit a site plan showing the location of temporary facilities, including layouts, details, equipment, material storage (onsite and offsite), access and haul routes used for this contract. Show the location of safety and construction fences, site trailers, construction entrances, trash dumpsters, and worker parking areas.
- j. Equipment Routing Path Plan: Prior to the start of work, submit an equipment routing path plan

PART 2 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

that shows the route the equipment will be routed to the installation location.

- k. Contractor Safety Self-Evaluation Checklist.
- l. Accident Reports - submit if incidence occurs.
- m. Safety Submittals: Per Paragraph 34 and Attachment A, prior to construction.
- n. Schedule of Prices, initial due 21 calendar days after award and a detailed due prior to construction.
- o. Budget Management Summary: Per Attachment A.
- p. Record Drawings, due at Beneficial Occupancy
- q. Operation and Maintenance Information: Per Paragraph 23, Part 2 Attachment A, and Part 4. Due prior to testing as applicable, no later than 30 calendar days before Beneficial Occupancy.
- r. Licenses and Permits: Per Attachment A and Part 4.
- s. DD Form 1354: For all new construction, demolition, and any construction on an existing facility that adds new parts, items, or systems that are not maintenance or repair; e.g. replacement of windows, replacement of roofs, replacement of an exterior utility, adding an AC system, adding exterior lighting, the DOR shall prepare DD Form 1354 TRANSFER AND ACCEPTANCE OF MILITARY REAL PROPERTY, in accordance with UFC 1-300-08, available at http://65.204.17.188/report/doc_ufc.html . Submit form for Government approval a minimum of 30 calendar days prior to final acceptance of work.
- t. High Performance and Sustainable Building (HPSB) compliance checklists in accordance with UFC 1-200-02, *High Performance and Sustainable Building Requirements*.

8.0 SUPERVISION

The Contractor shall have a supervisor fluent in English on the job site during working hours. Additional requirements per Attachment A.

9.0 SCHEDULE

Provide Design and Construction Schedule adequate for Contractor to efficiently manage project and for Government to efficiently manage QA and scheduling interfaces. Include construction phasing and any work restrictions (such as occupied spaces, special hours, potential work disruptions). Schedule shall contain DFOWs and dates for completion of each task including material procurement, and construction activities. Update the schedule at least monthly; use 3-week look-ahead for each QC meeting.

10.0 BUDGET MANAGEMENT

The Contractor shall be responsible for budget management throughout the entire project. It is the intent of the Government to partner with the Contractor to maximize project value while strictly controlling contract modifications and maintaining overall fiscal control. When required in Attachment A, develop a Budget Management System for each phase of the design.

11.0 PRECONSTRUCTION CONFERENCE

PART 2 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210

APRIL 17, 2015

Prior to construction or demolition start, meet with representatives of the Contracting Officer to discuss and develop mutual understanding relative to administration of the safety programs, environmental issues, safety of building occupants and surrounding area, hazardous materials, waste disposal, construction QC procedures, construction schedule, labor provisions and other construction phase contract procedures. The Preconstruction Conference shall reinforce partnering philosophy initially established during the PAK.

12.0 ACCESSIBILITY

Provide barrier-free design in accordance with UFC 1-200-01, *General Building Requirements*.

13.0 CONTRACTOR'S PRODUCTION REPORTS

Submit Contractor Production Reports on forms furnished for this purpose. Complete the reports weekly unless otherwise requested by the Contracting Officer. Reports shall include:

- a. Worker hours by classification, move-on and move-off of construction equipment furnished by the prime, subcontractor or the Government, and materials and equipment delivered to the site.
- b. Safety meetings, checks and inspections.
- c. Disposition of Construction Waste Material: Per Waste Management Plan and per Environmental Protection Plan.
- d. Design and Construction Services: Including, but not necessarily limited to:
 - 1) Check all Contract Documents for correctness and correlation. If the Contractor notes any discrepancy or ambiguity, immediately notify the COR.
 - 2) Examine the work site as to conditions affecting the work. Field verify the site and scope of work, including but not limited to the measurement and location of all significant items required to perform the work. Failure by the Contractor to familiarize oneself with available information regarding these conditions shall not relieve the Contractor from the responsibility of successfully completing the work.

14.0 SCHEDULE OF PRICES

Submit on forms furnished by the Government. The initial schedule of prices may be preliminary for construction activities until the design is developed. Include a detailed breakdown of the contract price, with quantities for each kind of work. Include General Conditions, profit, and overhead in the unit prices. Break down into design and each construction category if stated in Attachment A. The Contractor may invoice for bonds once the Government has approved the bonds, however, no other requests for payment will be processed without an approved Schedule of Prices.

15.0 CONTRACTOR INVOICES

Contractor requests for payment shall conform and will be processed in accordance with the requirements of FAR 52.232-5 and FAR 52.232-27.

PART 2 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210

APRIL 17, 2015

- a. Content of Invoice: Requests for payment in accordance with the terms of the contract shall consist of the following: (If NFAS Clause 5252.232-9301 is present in the contract, documents shall be provided as attachments in Wide Area Workflow (WAWF). The maximum size limit per attachment is less than 2 megabytes, but you may have an unlimited number of attachments. If a document cannot be attached to WAWF due to system or size restrictions it shall be provided as instructed by the contracting officer). If NFAS Clause 5252.232.9301 is not present in the contract, follow the invoicing instructions provided in the contract.
 - 1) Contractor's Invoice on NAVFAC Form 7300/30, which shall show, in summary form, the basis for arriving at the amount of the invoice.
 - 2) Contractor's Monthly Estimate for Voucher (LANTNAVFACENGCOM Form 4-4330/110 (New 7/84)), with subcontractor and supplier payment certification.
 - 3) Affidavit to accompany invoice (LANTDIV NORVA Form 4-4235/4 (Rev. 5/81)).
 - 4) Updated copy of submittal register.
 - 5) Updated copy of progress schedule. Furnish as specified in "FAR 52.236-15, Schedules for Construction Contracts."
 - 6) Network mathematical analysis.
 - 7) Contractor Safety Self Evaluation Checklist (original)
 - 8) Final release (for final payment only)
- b. Payment:
 - 1) Payment will be made on Contractor's submission of itemized requests and will be subject to reduction for overpayments or increased for underpayments from previous payments. The Government may withhold payment or reduce payments for the following:
 - a) Defects in material or workmanship.
 - b) Claims the Government may have against the Contractor under or in connection with this contract.
 - c) Contractor's failure to submit an updated schedule.
 - d) Payroll violations.
 - e) Unless otherwise adjusted, repayment to the Government upon demand for overpayments made to the Contractor.
 - 2) Payments may be made for materials, stored off construction sites, under the following conditions:
 - a) Conditions described in Attachment A.
 - b) Materials adequately insured and protected from theft and exposure.
 - c) Materials not susceptible to deterioration or physical damage in storage or in transit to the job site are acceptable for progress payments. Items such as steel, machinery, pipe and fittings and electrical cable are acceptable, but items such as gypsum board; glass, insulation and wall

PART 2 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210

APRIL 17, 2015

covering are not.

d) Materials in transit to the job or storage site are not acceptable for payment.

e) Conditions specified in FAR 52.232-5(b) Payments Under Fixed Price Construction Contracts.

16.0 PROTECTION OF GOVERNMENT PROPERTY

Take special care to protect Government property. Return areas damaged as a result of construction under this contract to their original condition. In addition to FAR 52.236-9, *Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements*, perform the following:

- a. Remove or alter existing work or facilities in such a manner as to prevent injury or damage to any portion of the existing work or facilities that remain.
- b. Repair or replace portions of existing work altered during construction operations to match existing or adjoining work, as approved by the Contracting Officer. At the completion of operations, existing work shall be in a condition equal to or better than that which existed before new work started.
- c. Preserve the natural resources in accordance with the approved environmental protection plan.

17.0 EXISTING UNDERGROUND UTILITIES

Verify on-site utilities and have them marked out by a utility locator service prior to the start of construction. Where existing piping, utilities, oil and gas lines, and underground obstructions of any type that are to remain are indicated in locations to be traversed by new piping, ducts, and other work provided herein, and such are not indicated or specified to be removed, the elevations of the existing utilities and obstructions shall be determined before the new work is laid closer than the nearest manhole or other structure at which an adjustment in grade could be made. Obtain required dig permits and notify the Contracting Officer 21 calendar days prior to any excavation. Ensure crane operation does not damage underground utilities.

Refer to Attachment A for specific station requirements.

18.0 LICENSES / PERMITS

Obtain all appointments, licenses, and permits required to perform work under this contract at no additional expense to the Government. See "Permits Record of Decision" (PROD) form for list of permits. Comply with all applicable federal, state, and local laws, and base regulations and procedures. Provide evidence of such permits and licenses to the Contracting Officer before work commences and at other times as requested by the Contracting Officer (see FAR 52.236-7, *Permits and Responsibilities*). Coordinate permit applications with Navy or local environmental office.

The contractor shall submit a complete PROD form with the first design submittal package. A blank PROD form can be obtained at the Download Tab of Part 6 of the NAVFAC Design-Build website at the following link <http://ndbm.wbdg.org/system/html/6/453>. Contractor shall determine correct permit fees and pay said

PART 2 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210

APRIL 17, 2015

fees. Copies of all permits, permit applications, and the completed PROD form shall be forwarded to the Government's Civil Reviewer and Environmental Reviewer.

Contractor is exclusively responsible for his full compliance with patent laws and shall affirm that the company is licensed to use equipment and processes the company shall employ in this project.

19.0 CONTRACTOR WORK SITE

Limit use of the premises for work and for storage of material and equipment associated with the contract. Unless otherwise specified or separately agreed to, Government owned material handling equipment, transportation equipment or general tools will not be available for Contractor's use. Clean work area daily and after completion of the work, removing all loose debris and disposing of all non-permanent materials IAW the contractor's Waste Management Plan. Blocking access of roads for emergency personnel or vehicles is not permitted.

- a. **Equipment Routing Path Plan:** The Contractor must provide an equipment routing path plan to the contracting officer prior to the start of work; coordinate and obtain advance approval from the Contracting Officer. Plan must ensure minimum disturbance to building and building occupants.
- b. **Temporary Facilities:** The Contractor must provide his own office facilities; coordinate and obtain advance approval from the Contracting Officer. Provide and maintain suitable sanitary facilities within the construction limits of the contract. Dispose of sanitary waste in accordance with the applicable laws, and local regulation.
- c. **Contractor-Furnished Equipment:** Equipment is subject to the inspection and approval of the Contracting Officer, prior to and during the life of the contract. All equipment and vehicles shall display readily visible Contractor identification markings. Relocate stored Contractor equipment which may interfere with operations of the Government or with others on-site.
- d. **Contractor-furnished Material:** Protect and secure products stored at this site.

1) All replacement units, parts, components, and materials to be used in the maintenance, repair and alteration of facilities and equipment shall be new and compatible with the existing equipment on which it is to be used, and shall comply with applicable Government, commercial, or industrial standards such as Underwriter's Laboratories, Inc., and National Electrical Manufacturers Association.

2) In addition, submit a current certificate recognized by the State or local authority that states the Contractor has completed at least 10 hours of training in backflow preventer installations.

20.0 TEMPORARY UTILITIES

- a. The Government will provide water and power in reasonable quantities at the prevailing rates.
- b. All labor, material, and equipment necessary to affect temporary utility tie-ins, including transformers if necessary, shall be at the expense of the Contractor and under the surveillance of the Contracting Officer.
- c. The Contractor shall be responsible for any damages to Government, private or public facilities and property that may result from the installation and removal of these temporary utility tie-ins. Corrections and repairs shall be made at the Contractor's expense.

PART 2 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

- d. The actual location and installation of the temporary tie-in, together with any interruptions of utilities systems, shall be identified and approved by the Contracting Officer prior to execution. Notify the COR and Station Utilities 15 calendar days prior to any tie-ins.
- e. Permanent utility systems, when indicated, will be available for tie-in.
- f. Telephone and Data Service: Make arrangements with local telephone company, NMCI and other pertinent base communication departments.
- g. Maintain utility services to existing facilities surrounding the site at all times during construction.
- h. Contractor shall install and certify back flow preventers on all connections to the potable water supply system.

21.0 ENVIRONMENTAL CONTROLS AND PROTECTION

Unforeseen Hazardous Conditions: Do not disturb hazardous materials and report condition immediately to the Contracting Officer potentially hazardous conditions that are uncovered or the Contractor becomes aware of that have not been identified in the RFP. This includes hazardous components and materials and contamination (see UFC 3-800-10N, *Environmental Engineering for Facility Construction*, for more information). This includes conditions that are not only hazardous to humans but wildlife, marine life and the environment. Stop work in the area of the questionable material or condition until identification and direction is provided.

22.0 WASTE MANAGEMENT

Develop a Waste Management Plan that identifies all recyclable material and disposal methods for all material. Contractor shall reduce, recycle or salvage as much waste material as possible with a goal of diverting at least 50% of construction waste from landfill. Address waste reduction, recycling and salvage as part of the waste management plan. Report volume or weight of disposed and recycled materials. Report destination of debris diverted from disposal. The Contractor is responsible for removing and disposing of all waste materials generated. Consider all material recyclable or reusable, unless clearly demonstrated the material requiring disposal is waste material.

23.0 RECORD DRAWINGS AND OPERATION & MAINTENANCE (O&M) DATA

Furnish hard copy and electronic format for all as-built and O&M information. Record drawings shall incorporate all changes to the approved final design. Provide O&M data for as-built products, materials, and equipment, including data sheets, test reports, warranties, certificates, list of spare parts suppliers for all pieces of equipment, and approved construction submittals. Refer to Attachment A.

24.0 WARRANTY

Warrant all materials and work for not less than one year after final acceptance of the work, except as otherwise indicated in this RFP. If required to provide remedial repair of previously installed work due to latent defect or unacceptable work performance, warrant the repaired work for one year after the completion

PART 2 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222

WORK ORDER NO. 1327210

NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

APRIL 17, 2015

and acceptance of the repair. For warranted items, furnish the manufacturers' original written warranty accompanied by a copy of the supplier's receipt showing place of purchase, telephone number of supplier, address, delivery order number if applicable, and ticket number.

25.0 PERFORMANCE EVALUATIONS

The evaluation will take into account all aspects of the Contractor's performance, including evaluations from Performance Assessment Plans when included in Attachment A. Performance evaluations may be completed any time during the contract. The Government will provide a copy of the performance evaluation and an opportunity to discuss the evaluation. The performance evaluations will have an impact on the award of future contracts.

26.0 WORK HOURS, ACCESS AND PASSES

All Contractor employees, including subcontractors, and subcontractors' employees, suppliers, and suppliers' employees shall be required to comply with the Installation Security Requirements regarding personnel, vehicle, and equipment security passes and access the jobsite. Nothing in the contract shall be construed in any way to limit the authority of the Commanding Officer to prescribe new, or to enforce existing security regulations governing the admission or exclusion of persons and the conduct of persons while aboard the station, including but not limited to, the rights of search of all persons or vehicles aboard the station.

Coordinate with the Contracting Officer for specific security and access requirements.

- a. Access to Buildings/ Occupied Buildings: The Contractor may work in or around existing occupied buildings. The Contractor is responsible, via the Contracting Officer, to obtain access to building and facilities and arrange for them to be opened and closed. Do not enter the building(s) without prior approval of the Contracting Officer. Keep the existing buildings and their contents secure at all times. Provide temporary closures as required to maintain security. Contract personnel will not be permitted in security-regulated buildings or areas unless cleared by the Security Officer.
- b. Passes and Badges: Contractor employees and representatives performing work under this contract are required to be either United States citizens or documented legal residents (status verified by prime contractor). All Contractor employees shall obtain the required employee and vehicle passes. Follow guidance per Attachment A for bases that participate in the Navy Commercial Access Control System (NCACS). Each employee shall wear the Government issued badge over the front of the outer clothing. Failure to obtain security and base access passes shall not be a cause for contract performance time extension. The Contractor shall immediately turn in all terminated employee's badges to the issuing office.

1) Personnel will be issued appropriate identification badges when the Contractor submits, in writing on company letterhead, a list indicating that all individuals are bona fide employees. Employees shall complete questionnaires and other forms as required for security. Allow 14 calendar days for background checks and processing. The list shall contain the following information:

- a) Name of employee
- b) Social Security Number
- c) Date of Birth
- d) Place of Birth

PART 2 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

- e) Citizenship, Statement of (U.S.) or proof of documented legal residency
- f) Employment Eligibility Verification Form (DHS FORM I-9). This form is available at <http://uscis.gov/graphics/formsfee/forms/files/I-9.pdf>
- c. Contractor Vehicles: All vehicles shall display a valid state license plate and safety inspection sticker, if applicable, and shall be maintained in good repair. The company name shall be displayed in a clearly visible manner and size on each Contractor vehicle used in the course of work. Registration, proof of insurance and driver's licenses are required to obtain a station vehicle pass.
- d. Work Hours: Unless otherwise indicated, work will be located on a Government compound, military installation, or station. Contractor work hours shall be between 0630 and 1700 Monday through Friday, or as indicated in Attachment A. Obtain advance approval from the Contracting Officer for Contractor personnel to remain on site beyond normal working hours. Notify the Contracting Officer at least 15 calendar days in advance to obtain approval for access to the jobsite or work outside of normal working hours or on Saturday, Sunday, and Federal Holidays.
- e. Contractor Personnel: Provide the Contracting Officer the name(s) of the supervisory person(s) authorized to act for the Contractor. Provide, and update as required, a list of the key personnel for the Contractor and subcontractors including addresses and telephone numbers for use in the event of an emergency.
- f. Contractor employees shall conduct themselves in a proper, efficient, courteous and businesslike manner. Remove from the site any individual whose continued employment is deemed by the Contracting Officer to be contrary to the public interest or inconsistent with the best interests of National Security.
- g. Operations performed by contractor that involve the use of equipment with output of high noise levels shall be scheduled for weekends or after duty working hours. Use of any such equipment shall be approved in writing by the KO prior to the commencement of work.

27.0 SECURITY REQUIREMENTS

All security requirements apply to all subcontractors and suppliers associated with this contract. Special or extraordinary security requirements are identified in Attachment A. In addition to special or extraordinary security requirements, comply with the following:

- a. Do not publicly disclose any information concerning any aspect of the materials or services relating to this contract, without prior written approval of the Contracting Officer.
- b. Do not disclose or cause to be disseminated any information concerning the operations of the activity's security or interrupt the continuity of its operations.
- c. Do not disclose any information to any person not entitled to receive it. Failure to safeguard any classified information that may come to the Contractor or any person under his control, may subject the Contractor, his agents or employees to criminal liability under 18 U.S.C., Sections 793 and 798.
- d. Direct to the Contracting Officer and or Installation Security Officer for resolution all inquiries, comments or complaints arising from any matter observed, experienced, or learned as a result of

PART 2 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210

APRIL 17, 2015

or in connection with the performance of this contract, the resolution of which may require the dissemination of official information.

- e. Coordinate photography requirements with the Contracting Office. Some areas restrict or prohibit photographing Government property.

Deviations from or violations of any of the provisions of this paragraph, will, in addition to all other criminal and civil remedies provided by law, subject the Contractor to immediate termination for default and withdrawal of the Government's acceptance and approval of employment of the individuals involved.

28.0 REQUIRED INSURANCE

Within 15 calendar days after award, furnish the Contracting Officer a Certificate of Insurance as evidence of the following insurance coverage amounts not less than the amount specified below in accordance with FAR Clause 52.228-5, *Insurance Work On A Government Installation*:

- a. Comprehensive General Liability: \$500,000 per occurrence.
- b. Automobile Liability: \$200,000 per person, \$500,000 per occurrence for bodily injury; \$20,000 per occurrence for property damage.
- c. Worker's Compensation: As required by Federal and State Worker's compensation and occupational disease and other laws.
- d. Employer's Liability Coverage: \$100,000, except in states where worker's compensation may not be written by private carriers.
- e. Others as required by state law.
- f. Above insurance coverages are to extend to Contractor personnel operating Government owned equipment and vehicles.
- g. The Certificate of Insurance shall provide for 30 calendar days written notice to the Contracting Officer by the insurance company prior to cancellation or material change in policy coverage. Other requirements and information are contained in Attachment A.

For projects which require removal of asbestos containing materials the Asbestos Contractor or Subcontractor, as the case may be shall provide occurrence-based liability insurance with asbestos coverages in an amount not less than \$1,000,000 and shall name the Government and PQP as additional insureds.

29.0 PROPRIETARY RIGHTS

All field notes, design drawings, specifications, and other documents collected and produced as part of this contract shall be considered property of the Government. These data shall not be used, in whole or part, published or unpublished, as a part of any technical or non-technical presentation without written

PART 2 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.
pre-approval of the Contracting Officer.

WORK ORDER NO. 1327210
APRIL 17, 2015

30.0 GOVERNMENT FURNISHED MATERIAL AND EQUIPMENT

If applicable, the Government will furnish the materials and equipment for installation by the Contractor pursuant to contract clause FAR 52.245-2, *Government Property (Fixed Price Contracts)*. Notify the Contracting Officer in writing at least 15 calendar days before the materials and equipment are required. Pick up materials and equipment no later than 30 calendar days after such date. When materials and equipment are not picked up by the 30th day, the Contractor will be charged for storage at the prevailing rate. The Contracting Officer will specify the location of materials and equipment and the delivery location.

31.0 ORAL MODIFICATION

No oral statement by any person other than the Contracting Officer, as provided in the contract clause entitled, "CHANGES AND CHANGED CONDITIONS," will in any manner or degree modify or otherwise affect the terms of this contract.

32.0 NO WAIVER BY THE GOVERNMENT

The failure of the Government in any one or more instances to insist upon strict performance to any of the terms of this contract or to exercise any option herein conferred shall not be construed as a waiver or relinquishment to any extent of the right to assert or rely upon such terms or options on any future occasion.

33.0 EQUITABLE ADJUSTMENTS - WAIVER AND RELEASE OF CLAIMS

- a. Whenever the Contractor submits a claim for equitable adjustment under a clause which provides for equitable adjustment of the contract, such claim shall include all types of adjustments in the total amounts to which the clause entitles the Contractor, including, but not limited to, adjustment arising out of delays or disruptions.
- b. Except as the parties may otherwise expressly agree, the Contractor shall be deemed to have waived: (1) any adjustments to which he otherwise might be entitled under the clause where such claim fails to request such adjustments; and (2) any increase in the amount of equitable adjustments additional to those requested in its claim.
- c. The Contractor agrees that, if required by the Contracting Officer, it shall execute a release, in form and substance satisfactory to the Contracting Officer, as part of the supplemental agreement setting forth the aforesaid equitable adjustment. The Contractor further agrees that such release shall discharge the Government, including its officers, agents, and employees, from any further claims, including, but not limited to, further claims arising out of delays or disruptions caused by the aforesaid change.

34.0 SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS

- a. References: The publications listed below form a part of this specification to the extent referenced.

PART 2 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

Use current version of referenced requirements at the time of contract solicitation. The publications are referred to within the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z359.1, *Safety Requirements for Personal Fall Arrest System, Subsystems and Components*

ANSI A10.32, *Fall Protection systems for Construction and Demolition Operations*

ANSI A10.6, *Demolition Operations*

ANSI Z9.2, *Fundamentals Governing the Design and Operation of Local Exhaust Systems*

ANSI Z88.2, *Respiratory Protection*

ANSI Z358.1, *Emergency Eyewash and Shower Equipment*

ASME INTERNATIONAL (ASME)

ASME B30.22, *Articulating Boom Cranes*

ASME B30.3, *Construction Tower Cranes*

ASME B30.5, *Mobile and Locomotive Cranes*

ASME B30.8, *Floating Cranes and Floating Derricks*

AMERICAN SOCIETY OF TESTING AND MATERIALS (ASTM)

ASTM Standards on Lead-Based Paint Abatement in Buildings

ASTM E 1368, *Visual Inspection of Asbestos Abatement Projects*

DEPARTMENT OF DEFENSE (DoD)

MIL-STD-1472F, *Military Standard, Human Engineering Design Criteria for Military Systems, Equipment and Facilities*

DoD-HDBK 743A, *Anthropometry of US Military Personnel*

DEFENSE LOGISTICS AGENCY (DLA)

DLA 4145.25, *Storage and Handling of Compressed Gases and Liquids in Cylinders*

EPA Standards and Documents - General

15 U.S.C. 2601 - *Toxic Substances Control Act*

EPA Title X - *The Residential Lead Based Paint Hazard Reduction Act*

EPA & HUD - *Lead Safe Work Practices*

HUD Guidelines, *Guidelines for the Evaluation and Control of Lead Based Paint Hazards in Housing*

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 241, *Safeguarding Construction, Alteration, and Demolition Operations*

NFPA 51B, *Fire Prevention During Welding, Cutting, and Other Hot Work*

NFPA 70, *National Electrical Code*

NFPA 70E, *Electrical Safety in the Workplace*

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 Safety -- *Safety and Health Requirements*

UNITED FACILITIES CRITERIA (UFC)

UFC 3-560-01, *Electrical Safety, O&M*

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910 *Occupational Safety and Health Standards*

29 CFR 1910.146 *Permit-required Confined Spaces*

29 CFR 1915 *Occupational Safety and Health Standards for Shipyard Employment*

29 CFR 1926 *Safety and Health Regulations for Construction*

PART 2 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210

APRIL 17, 2015

- b. Submittals: A "G" following a submittal indicates that Government approval action is required.
- 1) Contractor Accident Prevention Plan (APP), comply with EM 385-1-1, Appendix A; G
 - 2) Contractor Safety Self-Evaluation Checklist; G
 - 3) Monthly Work-Hour Reports
 - 4) Crane Critical Lift Plan; G
 - 5) Accident Reports – submit if incidence occurs.
 - 6) Activity Hazard Analyses, as applicable.
- c. Weight Handling Equipment (WHE) Accident: A WHE accident occurs when any one or more of the eight elements in the operating envelope fails to perform correctly during operation, including operation during maintenance or testing resulting in personnel injury or death; material or equipment damage; dropped load; derailment; two-blocking; overload; or collision, including unplanned contact between the load, crane, or other objects. A dropped load, derailment, two-blocking, overload and collision are considered accidents even though no material damage or injury occurs. A component failure (e.g., motor burnout, gear tooth failure, bearing failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, roll over).
- d. Contractor Safety Self-Evaluation Checklist: Contracting Officer will provide a "Contractor Safety Self-Evaluation checklist" to the Contractor. Complete the checklist monthly and submit with each request for payment. A score of 90 or greater is required. Failure to submit the completed safety self-evaluation checklist or achieve a score of at least 90, will result in a retention of up to 10 percent of the voucher.
- e. Regulatory Requirements: In addition to the detailed requirements included in this contract, work performed shall comply with USACE EM 385-1-1, and the laws, ordinances, criteria, rules and regulations included in Attachment A. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply. UFC 3-560-01 takes precedence over all other guidance for electrical safety.
- f. Site Safety and Health Officer (SSHO) Qualifications & Duties: SSHO shall perform safety and occupational health management, surveillance, inspections, and safety enforcement for the Contractor. The assignment of the SSHO does not relieve the Contractor from the regulatory requirements governing safety responsibility. The SSHO on this project can be the site superintendent unless otherwise indicated in Attachment A.
- In addition to duties required in EM 385-1-1 the SSHO shall perform the following:
- 1) Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Attach safety inspection logs to the daily production report.
 - 2) Attend pre-construction conference, pre-work meetings including preparatory inspection meeting, and periodic progress meetings.

PART 2 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

Failure to actively apply an acceptable safety program will result in dismissal and a project work stoppage that will remain in effect pending approval of a suitable replacement.

g. Accident Notification and Reports

1) For recordable injuries and illnesses, and property damage accidents resulting in at least \$2,000 in damages, the Prime Contractor shall conduct an accident investigation to establish the root cause(s) of the accident, fill out the Contractor Incident Report (CIR) electronically and submit via the NAVFAC Enterprise Safety Applications Management System (ESAMS) within 5 calendar days. The Contracting Officer will provide copies of any required or special forms.

2) For any weight handling equipment accident (including rigging gear accidents), the Prime Contractor shall conduct an accident investigation to establish the root cause(s) of the accident, complete the WHE Accident Report (Crane and Rigging Gear) form and provide the report to the Contracting Officer within 30 calendar days of the accident. Crane operations shall not proceed until cause is determined and corrective actions have been implemented to the satisfaction of the contracting officer. The Contracting Officer will provide a blank copy of the accident report form.

3) Notify the Contracting Officer as soon as practical, but not later than four hours, after any accident meeting the definition of Recordable Injuries or Illnesses or High Visibility Accidents, property damage equal to or greater than \$2,000, or any weight handling equipment accident. Include contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (e.g., type of construction equipment used, PPE used). Preserve the conditions and evidence on accident site until the Government investigation team arrives and Government investigation is conducted.

4) Monthly Work-Hour Reports: Monthly work-hour reporting to the Contracting Officer is required to be attached to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both prime and subcontractor. The Contracting Officer will provide copies of any special forms.

h. Hot Work: Prior to performing "Hot Work" (e.g., welding, cutting) or operating other flame-producing/ spark-producing devices, request a written permit from the Fire Division. **CONTRACTORS ARE REQUIRED TO MEET ALL CRITERIA BEFORE A PERMIT IS ISSUED.** It is mandatory to have a designated FIRE WATCH for any "Hot Work" done at this activity. The Fire Watch shall be trained in accordance with NFPA 51B and remain on-site as required after completion of the task or as specified on the hot work permit.

i. Hazardous Material Use: Each hazardous material must receive approval prior to being brought onto the job site or prior to any other use in connection with this contract. Allow a minimum of 10 working days for processing of the request for use of a hazardous material.

Notwithstanding any other hazardous material used in this contract, radioactive materials or instruments capable of producing ionizing/non-ionizing radiation (with the exception of radioactive material and devices used in accordance with USACE EM 385-1-1 such as nuclear density meters for compaction testing and laboratory equipment with radioactive sources) as well as materials which contain asbestos, mercury or polychlorinated biphenyls, di-isocyanates, or lead-based paint are prohibited. The Contracting Officer, upon written request may consider exceptions to the use of any of the above excluded materials.

The Request for Proposal should have identified materials such as PCB, lead paint, and friable and non-friable asbestos. If material, not indicated, that may be hazardous to human health upon

PART 2 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222

WORK ORDER NO. 1327210

NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

APRIL 17, 2015

disturbance during construction operations is encountered, stop that portion of work and notify the Contracting Officer immediately. Within 14 calendar days the Government will determine if the material is hazardous. If material is not hazardous or poses no danger, the Government will direct the Contractor to proceed without change. If material is hazardous and handling of the material is necessary to accomplish the work, the Government will issue a modification pursuant to FAR 52.243-4, *Changes*, and FAR 52.236-2, *Differing Site Conditions*.

- j. Pre-outage Coordination Meeting: Apply for utility outages at least 15 calendar days in advance. Provide Utility Outage Request Form, found in Part 6, Attachments, which shall include the location of the outage, utilities being affected, duration of outage and any necessary sketches. Once approved, and prior to beginning work on the utility system requiring shut down, attend a pre-outage coordination meeting with the Contracting Officer to review the scope of work and the lock-out/tag-out procedures for worker protection. No work will be performed on energized electrical circuits unless proof is provided that no other means exist.

- k. Fall Hazard Protection and Prevention Program: Establish a fall protection and prevention program, for the protection of all employees exposed to fall hazards. Include company policy; identify responsibilities, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment and rescue and evacuation procedures.
 - 1) Fall Protection for Roofing Work: Implement all protection controls based on the type of roof being constructed and work being performed. Evaluate the roof area to be accessed for its structural integrity including weight-bearing capabilities for the projected loading.
 - a) A safety monitoring system is not adequate fall protection for low sloped roofs and is not authorized.
 - b) Work on steep-sloped roofs, including residential or housing type construction, requires a personal fall arrest system, guardrails with toe-boards, or safety nets.
 - 2) Fall Prevention and Design: During design, consider and eliminate fall hazards encountered at the facility during maintenance evolutions whenever possible. If it is not feasible to eliminate or prevent the need to work at heights with its subsequent exposure to fall hazards, include control measures in the design to protect personnel conducting maintenance work after completion of the project. In addition to the detailed requirements included in the provisions of this contract, incorporate the requirements of 29 CFR 1910 Standards in the design (29 CFR 1915 applies for work in Shipyards).

- l. Weight Handling Equipment: All handling equipment must meet the requirements of NAVFAC P-307 Section 1.7.2.
 - 1) Crane Critical Lift Plan: Prepare and sign weight handling critical lift plans for lifts over 75 percent of the capacity of the crane or hoist (or lifts over 50 percent of the capacity of a barge mounted mobile crane's hoists) at any radius of lift; lifts involving more than one crane or hoist; lifts of personnel; and lifts involving non-routine rigging or operation, sensitive equipment, or unusual safety risks. Submit the plan 15 calendar days prior to on-site work and include the requirements of USACE EM 385-1-1, paragraph 16.C.18. as well as the following:
 - a) For lifts of personnel, demonstrate compliance with the requirements of 29 CFR 1926.550(g).
 - b) For barge mounted mobile cranes, barge stability calculations identifying barge list and trim based on anticipated loading; and load charts based on calculated list and trim. The amount of list

PART 2 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

and trim shall be within the crane manufacturer's requirements.

- 2) Provide a Certificate of Compliance for each crane entering an activity under this contract (see Contracting Officer for a blank certificate). Certificate shall state that the crane and rigging gear meet applicable OSHA regulations (with the Contractor citing which OSHA regulations are applicable, e.g., cranes used in construction, demolition, or maintenance shall comply with 29 CFR 1926 and USACE EM 385-1-1 section 16 and Appendix H. The Certificate of Compliance shall state that the crane operator(s) is qualified and trained in the operation of the crane to be used. Also certify that all of its crane operators working on the DOD activity have been trained in the proper use of all safety devices (e.g., anti-two block devices). Post these certifications on the crane.
 - 3) Notify the Contracting Officer 15 days in advance of any cranes entering the activity so that necessary quality assurance spot checks can be coordinated. Contractor's operator shall remain with the crane during the spot check.
 - 4) Comply with the crane manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Perform erection under the supervision of a designated person (as defined in ASME B30.5). Perform all testing in accordance with the manufacturer's recommended procedures.
 - 5) Comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, and ASME B30.8 for floating cranes and floating derricks.
 - 6) Under no circumstance make a lift at or above 90% of the crane's rated capacity in any configuration.
 - 7) When operating in the vicinity of overhead transmission lines, operators and riggers shall be alert to this special hazard and shall follow the requirements of USACE EM 385-1-1 section 11 and ASME B30.5 or ASME B30.22 as applicable.
 - 8) Use cribbing when performing lifts on outriggers.
 - 9) Position the crane hook/block directly over the load. Side loading of the crane is prohibited.
 - 10) Certification records which include the date of inspection, signature of the person performing the inspection, and the serial number or other identifier of the crane that was inspected shall be available for review by Contracting Officer personnel.
 - 11) Written reports listing the load test procedures used along with any repairs or alterations performed on the crane shall be available for review by Contracting Officer personnel.
 - 12) Certify that all crane operators have been trained in proper use of all safety devices (e.g. anti-two block devices).
 - 13) Take steps to ensure that wind speed does not contribute to loss of control of the load during lifting operations. Prior to conducting lifting operations, set a maximum wind speed at which a crane can be safely operated based on the equipment being used, the load being lifted, experience of operators and riggers, and hazards on the work site. Include this maximum wind speed determination in the activity hazard analysis plan for that operation.
- m. Utilities Within Concrete Slabs: Utilities located within concrete slabs are extremely difficult to identify due to the reinforcing steel used in the construction of these structures. Whenever work involves concrete chipping, saw cutting, or core drilling, the existing utility location must be

PART 2 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

coordinated with station utility departments in addition to a private locating service. Outages to isolate utility systems shall be used in circumstances where utilities are unable to be positively identified. The use of historical drawings does not alleviate the contractor from meeting this requirement.

- n. Conduct of Electrical Work: Follow electrical safety criteria specified in UFC 3-560-01, USACE EM 385-1-1, and NFPA 70E during the conduct of all work.
- o. Work in Confined Spaces: In addition to the requirements of Section 06.I of USACE EM 385-1-1, OSHA 29 CFR 1910.146 and OSHA 29 CFR 1926.21(b)(6), comply with the following paragraphs. Any potential for a hazard in the confined space requires a permit system to be used.
 - 1) Confined Space Signage: Provide permanent signs integral to or securely attached to access covers for permit-required confined spaces provided by this contract. Signs wording: "DANGER--PERMIT-REQUIRED CONFINED SPACE - DO NOT ENTER -" in bold letters a minimum of 25 mm (one inch) in height and constructed to be clearly legible with all paint removed. The signal word "DANGER" shall be red and readable from 1.52 m (5 feet).
 - 2) Entry Procedures. Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and all potential hazards are controlled or eliminated and documented. (See Section 06.I.06 of USACE EM 385-1-1 for entry procedures.) Review all hazards pertaining to the space with each employee during AHA process.
 - 3) Forced air ventilation is required for all confined space entry operations. Maintain minimum air exchange requirements to ensure exposure to any hazardous atmosphere is kept below its' action level.
 - 4) Sewer wet wells require continuous atmosphere monitoring with audible alarm for toxic gas detection.
- p. Ergonomics Considerations During Design: Design facilities, processes, job tasks, tools and materials to reduce or eliminate work-related musculoskeletal (WMSD) injuries and risk factors in the workplace. Design maintenance access to reduce WMSD risk factors to the lowest level possible. In addition to requirements included in this contract, design shall incorporate the requirements of MIL-STD-1472F.

-- End of Section --

PART 2 – ATTACHMENT A PROJECT-SPECIFIC GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222

WORK ORDER NO. 1327210

NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

APRIL 17, 2015

Part 2 Attachment A Project-Specific General Requirements

The following requirements are project specific and may either supplement and/or modify those requirements contained in the body of Part 2, General Requirements, for Small Projects. Paragraph numbers in Part 2 correspond to paragraph numbers used in Part 2, Attachment A.

Paragraph 3 POST AWARD KICKOFF MEETING (PAK)

Paragraph 4 DESIGN

Submit design drawings or sketches, calculations and manufacturer's data to demonstrate compliance with contract requirements. The Contractor is encouraged to prepare design drawings more like shop drawings to minimize construction submittals.

Provide hard (all hard submittals shall be on minimum 30% postconsumer fiber paper, and, when 11x17 or smaller, double-sided) and electronic copies of design submittal package to the following reviewers 1 week prior to the over-the-shoulder review meeting:

DELIVERABLE	NFEAD/ ROICC	IPT	JACOBS	User
Design Development				
Half-size Drawings or Sketches	2	8	2	2
Specifications and Manufacturer's Cut Sheets	2	8	2	2
Design/Construction Schedule	2	8	2	2
Budget Management Status	2	8	2	2
Calculations	2	8	2	2
PROD Form (Permits)	2	8	2	2
CD with electronic files of all hard copy deliverables listed above	1	1	1	1
Final Design				
Half-size Drawings or Sketches	2	8	2	2
Specifications and Manufacturer's Cut Sheets	2	8	2	2
Design/Construction Schedule	2	8	2	2
Budget Management Status	2	8	2	2
Calculations	2	8	2	2
PROD Form (Permits)	2	8	2	2
CD with electronic files of all hard copy deliverables listed above	2	8	2	2

PART 2 – ATTACHMENT A PROJECT-SPECIFIC GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

1. The final design submittal must be professionally signed and sealed by the DOR and forwarded to the Contracting Officer prior to the start of construction. Separated final design packages will only be considered for Government review and approval during the Post Award Kick-off Meeting. The design submittals must be approved by the Contracting Officer prior to the start of construction:
2. Construction submittals are to be Contractor-approved, except those listed below:
 - a. DOR Approval required for:
 - 1) Electrical components.
 - 2) Fire Protection related submittals
 - 3) HVAC Testing, Adjusting, and balancing.
 - 4) HVAC Equipment and Controls.
 - 5) Architectural metal enclosure.
 - b. Government Approval required for:
 - 1) Electrical components.
 - 2) Fire Protection related submittals
 - 3) HVAC Testing, Adjusting, and balancing.
 - 4) HVAC Equipment and Controls.
 - 5) Architectural metal enclosure.
3. Submit the following construction submittals, approved by the DOR, to the Government for surveillance:
 - a. Submit fire protection related submittals pertaining to spray-applied fire proofing and fire stopping, exterior fire alarm reporting systems, interior fire alarm & detection systems, and fire suppression systems including fire pumps and standpipe systems.
 - e. Submit telecommunications shop drawings for coordination with the NMCI Contractor.
 - f. Submit Performance Verification and Acceptance Testing required by IBC or this RFP.
 - g. Submit all Interim Special Inspection Reports on a bi-weekly basis until work requiring special inspections is complete. Submit all Structural Observation Reports and the Final Report of IBC Special Inspections.
 - h. For any pre-engineered buildings, submit shop drawings showing engineering data and complete building drawings, signed and sealed by a registered professional engineer.
 - i. Comply with sustainability submittals per UFGS section 01 33 29.05 20 *Sustainability Requirements for Design Build*.

Paragraph 5 FIRE PROTECTION AND LIFE SAFETY REQUIREMENTS

[The Contractor shall retain the services of a Registered Fire Protection Engineer (FPE). This FPE shall be an integral part of the Prime Contractor's Design and Quality Control Organization, and shall have no business relationships (owner, partner, operating officer, distributor, salesman, or technical representative) with any fire protection equipment device manufacturers, suppliers or installers for any such equipment provided as part of this project. Unless otherwise specified, all work performed on means of egress, fire rated elements, Fire Suppression, Mass Notification, and Fire Alarm Systems shall be designed, reviewed, inspected and approved by the FPE.

1. Qualifications/Experience:
 - a. Qualifications of the Designer: The FPE DOR shall have obtained professional registration by successfully completing the Fire Protection Engineering discipline examination.
 - b. Qualifications of the Installer: Prior to installation, submit data showing the Contractor has

PART 2 – ATTACHMENT A PROJECT-SPECIFIC GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222

WORK ORDER NO. 1327210

NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

APRIL 17, 2015

successfully installed systems of the same type and design as specified herein, or that Contractor has a contractual agreement with a subcontractor having such experience. Include names and locations of at least two installations where the Contractor, or subcontractor, has installed such systems. Indicate type and design of each system and certify that each has performed satisfactorily as intended for not less than 18 months.

- c. **Qualifications of the System Technician:** Installation drawings, shop drawing and as-built drawings shall be prepared, by or under the supervision of, an individual who is experienced with the types of works specified herein, and is currently certified by the National Institute for Certification in Engineering Technologies (NICET) as an engineering technician with minimum Level-III certification in the fire protection certification program applicable to the work being performed. Submit data for approval showing the name and certification of all involved individuals with such qualifications at or prior to submittal of drawings.
2. **Area of Responsibility:** The FPE is responsible for assuring the proper design, construction and installation of life safety, fire protection, and mass notification features across all disciplines and trades. Services include preparing the Design Analysis, preparing or reviewing and approving the design documents (drawings), preparing or reviewing all fire protection related specification sections (including fireproofing, firestopping, fire suppression systems, and mass notification and fire alarm systems), certifying in writing that the completed design incorporates all required features, and certifying in writing that the facility was constructed in accordance with the approved design documents and applicable criteria. The FPE shall be responsible for assuring that the construction and installation are in accordance with the approved design documents by reviewing and approving all fire protection construction submittals, providing construction surveillance and preliminary and final inspections and testing services. Examples include, but are not limited to, water distribution systems including fire pumps and fire hydrants, fire resistive assemblies such as spray-applied fire proofing of structural components and fire rated walls/partitions, mass notification, fire alarm and detection systems, fire suppression and standpipe systems, means of egress components, and emergency and exit lighting fixtures. A copy of each approved submittal, with a copy of the Contractor's FPE review comments, shall be forwarded to the Government FPE prior to starting work for that item. This design review effort shall be a part of the Contractor's design quality control program, included in the design quality control plan, and shall be documented and submitted with each design development submittal.
 3. **Construction Surveillance:** The FPE shall visit the construction site as necessary to ensure life safety and fire protection systems are being constructed, applied, and installed in accordance with the approved design documents, approved construction submittals, and manufacturer's requirements. Frequency and duration of the field visits are dependent upon particular system components, system complexity, and phase of construction. At a minimum, field visits shall occur just prior to installation of suspended ceiling system to inspect the integrity of passive fire protection features and fire suppression system piping, preliminary inspections of mass notification, fire alarm/detection and suppression systems, and final acceptance testing of mass notification, fire alarm/detection and suppression systems.
 - a. **Preliminary and Final Inspections and Acceptance Testing:** FPE shall personally witness all preliminary inspections and testing of mass notification, fire alarm/detection and suppression systems. Once preliminary inspections and testing have been successfully completed, the FPE shall submit a signed certificate to the QC Manager that systems are fully compliant and ready for final inspection and acceptance testing. The QC Manager shall provide 14 days advance notice to the Contracting Officer to schedule the final inspection and acceptance testing with the activity Fire Inspection Office and the NAVFAC Fire Protection Engineer.
 - b. **Final Life Safety/Fire Protection Certification Documentation:** The FPE shall provide certification that all life safety and fire protection features and systems have been installed in accordance with applicable criteria, the contract documents, approved submittals, and manufacturer's requirements. This certification shall summarize all life safety and fire protection features, and shall bear the professional seal of the fire protection engineer.

PART 2 – ATTACHMENT A PROJECT-SPECIFIC GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

Paragraph 6 QUALITY CONTROL

Provide a QC manager at the work site of implement the QC program. The only duties and responsibilities of the QC Manager are to manage and implement the QC program of this contract. The Superintendent may not also serve as the Quality Control Manager on this project. The QC Organization is responsible for reviewing and certifying that submittals are in compliance with the contract requirements.

Special inspection, testing, approvals, certifications, observations and quality assurance plans as prescribed in Chapter 17 of the IBC are required.

Paragraph 7 SUBMITTAL PROCESSING

	SUBMITTAL/BENCHMARK	DURATION	BENCHMARK	RECEIVED	STATUS
1	Quality Control Plan				
2	Submittal Requirements				
3	Material Safety Data Sheets				
4	Design/Construction Schedule and Phasing Plan				
5	Waste Management Plan				
6	Safety and Health Plan				
7	Construction Site Plan				
8	Equipment Routing Path Plan				
9	Schedule of Prices				
10	Budget Management Summary				
11	Record Drawings				
12	Operation and Maintenance Information				
13	Licenses and Permits				
14	Badge Requests				
15	Statement of Acknowledgement SF 1413				
16	Demolition and Work Plan				
17	Design Development Docs				
18	Final Design Docs				
19	Submittal Register				
20	Performance/Payment Bonds				
21	Environmental Protection Plan				
22	Certificates of Insurance				
23	DD Form 1354				

PART 2 – ATTACHMENT A PROJECT-SPECIFIC GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222

WORK ORDER NO. 1327210

NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

APRIL 17, 2015

24	Sustainability Action Plan				
25	Sustainability Notebook				
26	NAVFAC Sustainability & Energy Data Record Card				

A submittal register will be prepared during the initial design stages of the project and indicate each design and construction submittal. Maintain an electronic version of the submittal register as work progresses. Transmit submittals with transmittal form prescribed by Contracting Officer and standard for this project.

Allow a review period, beginning when Government receives submittal from the QC organization, of 20 working days for return of submittal to the contractor. Period of review for each submittal is the same as initial submittal.

Paragraph 8 SUPERVISION

Paragraph 10 BUDGET MANAGEMENT

This project requires a Budget Management System be developed and maintained. The Budget Management System shall represent major portions of the work such as HVAC, site work, and exterior skin. The purpose of budget management is to balance scope and value during critical project design decisions. Update the budget management status at regular intervals during design, at a minimum with design submittals, for review by and discussion with the COR. The final budget management summary shall correspond with the final Schedule of Prices.

Paragraph 14 SCHEDULE OF PRICES

Additional Facility Price Data

For all projects over \$500K, the Contractor shall electronically submittal additional Facility Price Data to the Contracting Officer as a formal submittal within 15 calendar days of Contract Award. The cost breakout will be in first or second level WBS format, which will include the following:

1. Each individual facility to the five foot line.
2. The total site work/utilities from the five foot line outward.
3. The total Design Build Design Fee each as separate cost breakouts.

Use CLIN 0001AA, AB, AC, and AD from UFGS 00 22 13.00 20 SUPPLIMENTARY INSTRUCTIONS TO OFFERORS, as an example on how to prepare the cost breakout structure. Contact the NAVFAC Washington Cost Engineer for additional information and guidance on the development of cost breakout.

Paragraph 15 INVOICES

Paragraph 17 EXISTING UNDERGROUND UTILITIES

Paragraph 19 CONTRACTOR WORK SITE

Paragraph 20 TEMPORARY UTILITIES

PART 2 – ATTACHMENT A PROJECT-SPECIFIC GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222

WORK ORDER NO. 1327210

NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

APRIL 17, 2015

Paragraph 21 ENVIRONMENTAL CONTROLS AND PROTECTION

The DOR is required at a minimum to edit and submit the following:

UFGS 01 14 00	Work Restrictions
UFGS 01 50 00	Temporary Construction Facilities and Controls
UFGS 01 74 19	Construction and Demolition Waste Management
UFGS 02 41 00	Demolition and Deconstruction

The DOR must ensure state and local regulations are met within the edited UFGS section.

Paragraph 22 WASTE MANAGEMENT

Provide Waste Management Plan according to UFGS section 01 33 29.05 20 *Sustainability Requirements for Design Build*.

Paragraph 23 RECORD DRAWINGS AND OPERATION & MAINTENANCE (O&M) DATA

Provide the Contracting Officer with two copies of half size as-built drawings, one copy of full-size as-built drawings, and two CDs containing drawings (in both pdf and Autocad formats), and all construction submittals.

Paragraph 24 WARRANTY

Fan coil units – provide a minimum of a 2-year entire unit warranty from the end of construction date; Warranty to include associated piping assembly and controls.

Paragraph 25 PERFORMANCE EVALUATIONS

Paragraph 26 WORK HOURS, ACCESS AND PASSES

Application for and use of badges will be as directed. Obtain access to the installation by participating in the Navy Commercial Access Control System (NCACS) or by obtaining passes each day from the Base Pass and Identification Office. Costs for obtaining passes through the NCACS are the responsibility of the Contractor. One-day passes, issued through the Base Pass and Identification Office will be furnished without charge. Furnish a completed EMPLOYMENT ELIGIBILITY VERIFICATION (DHS FORM I-9) form for all personnel requesting badges. This form is available at <http://www.uscis.gov/portal/site/uscis> by searching or selecting Employment Verification (Form I-9). Immediately report instances of lost or stolen badges to the Contracting Officer.

1. NCACS Program: NCACS is a voluntary program in which Contractor personnel who enroll, and are approved, are subsequently granted access to the installation for a period up to one year, or the length of the contract, whichever is less, and are not required to obtain a new pass from the Base Pass and Identification Office for each visit. The Government performs background screening and credentialing. Throughout the year the Contractor employee must continue to meet background screening standards. Periodic background screenings are conducted to verify continued NCACS participation and installation access privileges. Under the NCACS program, no commercial

PART 2 – ATTACHMENT A PROJECT-SPECIFIC GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222

WORK ORDER NO. 1327210

NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

APRIL 17, 2015

vehicle inspection is required, other than for Random Anti-Terrorism Measures (RAM) or in the case of an elevation of Force Protection Conditions (FPCON). Information on costs and requirements to participate and enroll in NCACS is available at <http://www.rapidgate.com/vendors/how-to-enroll> or by calling 1-877-727-4342. Contractors should be aware that the costs incurred to obtain NCACS credentials, or costs related to any means of access to a Navy Installation, are not reimbursable. Any time invested, or price(s) paid, for obtaining NCACS credentials will not be compensated in any way or approved as a direct cost of any contract with the Department of the Navy.

2. One-Day Passes: Participation in the NCACS is mandatory.

Paragraph 27 SECURITY REQUIREMENTS

- a) The Naval Research Lab currently requires identification checks for all individuals seeking to enter the base. Prime Contractors and their subcontractors will be expected to obtain permanent identification badges for the duration of the project. Submit completed badge request forms for all employees seeking base access to the Engineering Technician immediately or a minimum of three weeks prior to date sought for base access.
- b) All workers must be US citizens.
- c) While on station, personnel shall respect the authority and obey the orders of uniformed guards. Speed limits are posted and range from 15-30 MPH. If not posted, obey a 15 MPH speed limit.
- d) Cameras are not allowed. If photos are required for documentation purposes, contact the Engineering Technician.

Paragraph 28 REQUIRED INSURANCE

Paragraph 30 GOVERNMENT FURNISHED MATERIAL AND EQUIPMENT

Paragraph 34 SAFETY AND OCCUPATIONAL HEALTH

The DOR is required to edit and submit UFGS 01 35 26, Governmental Safety Requirements.

Submit evidence of DOR qualifications as a Certified Industrial Hygienist (general practice) or Certified Safety Professional.

Sub-Paragraph f., Safety and Health Officer (SSHO)

The Site Safety and Health Officer may not serve also as the Superintendent.

Sub-Paragraph h., Hot Work

Obtain services from a NFPA Certified Marine Chemist for "HOT WORK" within or around flammable materials (such as fuel systems, welding/cutting on fuel pipes) or confined spaces (such as sewer wet wells, manholes, and vaults) that have the potential for flammable or explosive atmospheres.

Sub-Paragraph j., Pre-Outage Coordination Meeting

End of PART 2 Attachment A

Small Project Part 3 Statement of Work / Project Program

Table of Contents

CHAPTERS

1. PROJECT DESCRIPTION	2
2. PROJECT OBJECTIVES	5
3. SITE ANALYSIS	5
4. BUILDING REQUIREMENTS	6
5. ROOM REQUIREMENTS	6
6. ENGINEERING SYSTEMS REQUIREMENTS	6
A10 Foundations (Not Used)	
A20 Basement Construction (Not Used)	
B10 Superstructure	
B20 Exterior Closure (Not Used)	
B30 Roofing (Not Used)	
C10 Interior Construction	
C20 Stairs (Not Used)	
C30 Interior Finishes	
D10 Conveying Systems (Not Used)	
D20 Plumbing (Not Used)	
D30 HVAC	
D40 Fire Protection Systems (Not Used)	
D50 Electrical Power and Lighting	
E10 Equipment (Not Used)	
E20 Furnishings (Not Used)	
F10 Special Construction (Not Used)	
F20 Selective Building Demolition	
G10 Site Preparations	
G20 Site Improvements (Not Used)	
G30 Site Mechanical Utilities (Not Used)	
G40 Site Electrical Utilities (Not Used)	

1. PROJECT DESCRIPTION

Building 222 at the Naval Research Laboratory is primarily made up of office spaces with conference rooms scattered throughout the building. The building was built in the mid 1960's.

The perimeter of the building is served by a combination of fan coil units with built-in thermostats and the VAV system with space mounted thermostats. This project is to replace the fan coil units, while ensuring that downtime is kept at a minimum.

The scope of work includes, but is not limited to:

- A. Test the operation of the existing hydronic system serving the fan coil units
- B. Commission the function and performance of the fan coil hydronic system prior to design or construction
- C. Document the design intent of the fan coil units as they apply to the Building 222 HVAC system.
- D. Prepare preliminary construction documents for fan coil replacement. Preliminary construction documents shall include:
 - a. Selection of a single model of fan coil unit and no more than 3 casing types for replacement fan coil units.
 - b. A construction phasing plan and schedule.
 - c. Fan coil locations on plans for the entire building.
 - d. Typical piping and mounting details.
- E. Mockup. Installation of two new fan coil units (FCUs) in a single room as provided to the Contractor by the Government to show a complete functioning installation of two fan coil units, appearance of architectural enclosure, and functioning controls.
- F. Prepare final construction documents.
- G. Demolish existing fan coil units, isolation valves and control valves.
- H. Install new fan coil units in place of existing units.
- I. The new fan coil units shall consist of two types; a complete unit with factory enclosure and an architectural metal panel enclosure. The enclosure finish shall match the adjacent window frame finish. Finish to be confirmed by owner prior to mock ups.
- J. Provide unit-mounted network-ready programmable DDC thermostats that can connect to existing building automation system.
- K. Test and balance the existing fan coil pumps and hydronic system and the new fan coil units.
- L. Commission and document the function and performance of the new fan coil units.
- M. Patch and repair existing surfaces impacted by New Work. All surfaces to match adjacent existing finish.
- N. Install electrical connections for all replaced fan coil units. Utilize existing circuit breakers in existing panels and existing conduit from units to panels. Provide new conductors in existing conduits from each unit to existing panels.

EXISTING CONDITIONS

Mechanical

The building's HVAC system consists of two major parts; air handling systems to treat the interior loads and perimeter system to treat the envelope load. The perimeter systems of the building comprise of convector units, located at the courtyard full height windows, and perimeter fan coil units (FCUs). Both the convector units and FCUs still have their original housings.

Fan coil units are vertical, two-pipe units, with unit mounted controls. The fan coil units have two types of enclosures – a free standing unit with factory built enclosure and a unit with an architectural metal panel enclosure secured to the wall. FCU field built cabinets have a metal shell, with an

PART 3 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

integral mounting to the building perimeter wall. In most cases, the FCU cabinets have been painted since installation.

The zoned two-pipe fan coil system provides either heating or cooling based on Naval Research Laboratory (NRL) campus central steam and central chilled water plant switch over schedule. The building mechanical room receives steam from the central plant. Four (4) steam-to-hot water heat exchangers, located in the mechanical room, produce 180°F heating hot water during the heating season. The base central chilled water plant delivers 42°F chilled water to the building, which is then circulated to the fan coil units in the cooling season. The fan coil units are connected to four piping loops based on exposure – north, east, south, and west. Each exposure loop is served by one pump. The pumps are not interconnected, so there is currently no redundancy in pumping system. The distribution piping is connected from the pumps to the zones via piping below the first floor slab in the crawl space. This piping was replaced in 2005 as part of a piping replacement project. At that time all dual temperature pipe up to the fan coil unit isolation valves was replaced. The isolation and control valves for the fan coil units were not replaced. The heat exchangers and pumps are controlled locally. There currently is not a building wide control system serving the fan coil units or pumps.

Individual FCUs are controlled by a factory supplied modulating 2-way pneumatic control valve inside the cabinet of each unit. FCU fans are three (3)-speed powered by line voltage. This two-way valve has an integral capillary type temperature sensor, which is located in the return air path of the fan coil unit. There is a dial on the control valve to adjust the temperature set point. Each FCU is provided with a shut-off valve on supply and return piping within the FCU casing. The FCUs are controlled by an integral thermostat which modulates the control valve with a manual fan speed controller

The condensate drain system for some FCUs is obstructed and condensate water is leaking out of the FCUs during the cooling season.

Electrical

All existing fan coil units being replaced are 120V, 1/6 HP and are served from existing 1P–20A breakers (3 FCUs per 20A circuit) in existing 120/208V–3PH–4W–225A panel boards manufactured by Westinghouse as follows:

First Floor – North: Panel 'LA' located in Rm 125
 Panel 'LB' located in Rm 113

First Floor – South: Panel 'LC' located in Rm 120
 Panel 'LD2' located in Rm 154

Second Floor – North: Panel 'LF' located in Rm 206
 Panel 'LE' located in Rm 217

Second Floor – South: Panel 'G1' located in Rm 266
 Panel 'LH1' located in Rm 236

The existing wiring from each FCU to the serving panels is 50 years old and consists of copper conductors in EMT conduit of different lengths.

PHASING

Due to the disruption caused by this renovation work, a detailed construction phasing plan must be developed. This must be developed as a collaborative effort between the Government and the Contractor.

Contractor must coordinate with the Government to determine the number of occupied perimeter spaces which the government can vacate at one time. At a minimum, all fan coils within a single pumping zone should be replaced in a single phase of construction. Occupants must vacate each phased zone during construction. Secondary constraints involve the location of existing furniture, and the architectural finish conditions. In some cases system furniture panels are located adjacent to fan coil units. Contractor shall temporarily relocate furniture during the fan coil unit replacement. See Attachment 4 in the Part 6 for typical FCU and desk configuration.

NEW WORK

Mechanical

The new fan coil units shall maintain the functionality of the existing units. The field cabinet units shall have new enclosures. The standalone units shall be completely replaced in kind. The isolation and control valves shall also be replaced.

The contractor shall perform load calculations to determine the size of the new fan coil units.

Disconnect and remove electric and pneumatic controls associated with existing fan coil units, including unit mounted 3-speed fan switches, 2-way pneumatic valves with integral return air temperature sensors, wiring, and pneumatic tubing. The existing fan coil unit pneumatic controls need to be disconnected properly as not to cause issues with the remaining pneumatic controls and control air system in Building 222. When existing pneumatic controls are removed, pneumatic piping shall be removed back to the point of connection to the main air supply which remains in use, and shall be capped or plugged to prevent air leaks.

The new FCUs shall each be zoned in accordance with this document and as designed by the design build contractor. Each fan coil unit shall be provided with a two-way control valve, a return air temperature sensor, a changeover sensor and a network-ready DDC thermostat, which is BACnet compliant, with a DDC connection point to enable future connection to Building Siemens DDC controls. Install the new network-ready DDC thermostat in control box in the FCU new enclosure. The remote air temperature sensor shall be installed on return air path of the fan coil unit and used to control the FCU valve. The changeover sensor shall be provided on the hot/chilled water supply pipe to the fan coil unit to change the operation of thermostat from heating to cooling mode based on supply water temperature. Fan coil units shall have electronically commutated motors for multispeed high efficiency operation.

As part of the replacement of the fan coil units, it will be necessary to integrate the replacement units with the existing hydronic water distribution system. The performance of this system and its components shall be documented prior to the start of construction. The contractor shall document the performance of the system before construction begins, after the completion of each phase of construction, and after the final phase.

The condensate drainage system shall be cleaned with compressed air, vacuum, or mechanical means. Water shall be introduced into each condensate pipe at the fan coil unit and the contractor shall verify that the water discharges at the condensate drain termination point to ensure that the condensate drainage system is clear and water flows freely through the system.

PART 3 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

The new FCUs shall have a drain pan switch within each FCU to disable the fan coil unit before condensate overflow occurs.

Due to the disruption caused by this renovation work, a detailed construction phasing plan must be developed. This must be developed as a collaborative effort between the Government and the Contractor.

Electrical

The existing 1P-20A circuit breakers in existing panels, and associated conduits presently serving the FCUs being replaced, will be utilized to connect the new fan coil units. Since the FCUs are being replaced by units with equal horsepower as existing units, no adjustments are required to the panels or wiring. The FCUs will be furnished with a motor thermal disconnect switch. Replace existing # 12 AWG conductors in the existing conduit as required, to accommodate the new connections to the new fan coil units.

2. PROJECT OBJECTIVES

2.1 APPLICABLE CODES AND STANDARDS:

In addition to the codes and standards listed in Part 4, the design and construction shall be in accordance with the latest revision/edition of the following referenced codes and standards. The term "Latest Revision/Edition" is defined as the version as of the project award date.

1. Regional Standard: District of Columbia Construction Codes and Supplements.

2.2 SUSTAINABLE DESIGN

Provide integrated sustainable design strategies and features to minimize the energy consumption of the facilities; conserve resources; minimize adverse effects to the environment; and improve occupant productivity, health, and comfort.

Replacement fan coil units shall be equipped with electronically commutated multispeed motors and DDC interface to interconnect with future building energy management system.

Replacement fan coil units shall be commissioned to ensure proper operation.

2.3 ENERGY CONSERVATION

All new facilities projects shall conform to the latest edition of ASHRAE/IESNA Standard 90.1-2007 "Energy Standard for Buildings Except Low-Rise Residential Buildings".

3. SITE ANALYSIS

3.1 EXISTING SITE CONDITIONS

The site is located on the grounds of the Naval Research Laboratory in Washington, DC. It is an existing building. Existing utilities include water lines, sanitary sewer, storm sewer, electric, and underground telephone.

PART 3 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

Any staging areas or temporary equipment locations must be brought back up to the original conditions prior to construction.

4. BUILDING REQUIREMENTS

Provide construction phasing plan, dust control plan and HVAC control plan. Provide coordination drawing and narrative that indicate the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:

1. Locations of dust-control partitions at each phase of work.
2. HVAC system isolation schematic drawing.
3. Location of proposed air-filtration system discharge.
4. Waste handling procedures.
5. Other dust-control measures.

5. ROOM REQUIREMENTS

Existing fan coil units shall be replaced one for one with new fan coil units.

6. ENGINEERING SYSTEMS REQUIREMENTS (ESR)

B10 Superstructure
C10 Interior Construction
C30 Interior Finishes
D30 HVAC
D50 Electrical Power and Lighting
F20 Selective Building Demo
G10 Site Preparations

B10 SUPERSTRUCTURE

The structural system shall be designed using the following parameters:

Occupancy category: II

Live loads: In accordance with IBC.

Wind loads: Design wind speed: 115 mph; Exposure category C

Snow loads: Ground snow load: 25 psf; Roof exposure: Partially enclosed

Earthquake loads: Mapped seismic acceleration parameters: S_S : 0.118 ; S_1 : 0.051.

C10 INTERIOR CONSTRUCTION

C1030 SPECIALTIES

Enclosure

Fan coil units shall have architectural metal panel enclosure and match the adjacent window finish.

Firestopping Penetrations

When penetration impacted by New Work provide all sleeves, caulking, and flashing for firestopping penetrations.

C30 INTERIOR FINISHES

C3010 WALL FINISHES

Patch and repair walls impacted by New Work and match adjacent existing finish.

C3020 FLOOR FINISHES

Patch and repair floor surfaces impacted by New Work and match adjacent existing finish.

C3030 CEILING FINISHES

Patch and repair ceiling impacted by New Work and match/ align adjacent ceiling.

C3040 INTERIOR COATINGS AND SPECIAL FINISHES

Paint to match adjacent existing paint.

D30 HVAC

HVAC SYSTEM REQUIREMENTS

Provide air conditioning and heating for spaces as indicated and for the following Design conditions:

Outside Conditions					
Summer			Winter		
	92	Degrees F dry bulb		15	Degrees F
	76	Degrees F wet bulb			

Inside Conditions					
Summer			Winter		
	78	Degrees F dry bulb		68	Degrees F
	0-55	%RH			

Each zone shall have its own range of control, as allowed by the central heating and cooling system and local fan coil units.

D3050 TERMINAL & PACKAGE UNITS

Fan Coil Units

PART 3 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

Provide new vertical fan coil units per referenced design requirements.

Provide fan coil units with factory supplied enclosure or architectural metal enclosure to match existing enclosure.

Provide factory installed strainer, isolation and control valves integral to the fan coil unit.

Provide 3-speed electronically commutated motor (ECM).

Dual temperature coils shall utilize 180°F entering hot water and 42°F entering chilled water.

Provide ½” thick insulation for fan coil units with factory cabinets.

Units with field installed cabinets shall be designed to fit in place of existing fan coil unit field cabinets.

Provide throw away filters.

Provide condensate drain pan switch to shut down fan coil unit before water overflow occurs.

D3060 CONTROLS AND INSTRUMENTATION

HVAC Controls

Provide network-ready DDC thermostat with built-in temperature sensor and BACnet communication interface for future connection to the existing Siemens DDC system, to control two-pipe fan coil units provided in Building 222. DDC thermostat shall communicate using the protocols and network standards as defined by ASHRAE Standard 135-2010, BACnet. The DDC thermostat shall be BACnet-compliant and listed by the BACnet Testing Laboratory (BTL).

Provide network-ready DDC thermostat capable of fan control sequences with electronically commutated motors. Provide remote air temperature sensor on return air path of the fan coil unit for valve control and changeover sensor to change the operation of thermostat from heating to cooling operation based on supply water temperature. Also, provide DDC thermostat with backlit LCD display with status LEDs and stand-alone control functions including:

1. Integrated changeover function, which allows switching between cooling and heating mode;
2. Occupancy time with occupied and unoccupied mode set points for additional energy savings. Coordinate with the Government to initially set schedules and temperature to avoid interfering with occupant schedules and facility operations;
3. Password access to prevent unauthorized access to the configuration menu parameters.

The Contractor shall install the network-ready DDC thermostat in the control box provided by FCU manufacturer.

The network-ready DDC thermostat shall be powered from 24 VAC FCU control transformer. The Contractor shall make final connections as necessary to complete the system.

The Contractor shall furnish all control wiring between DDC thermostats and fan coil units. All low voltage wiring shall comply with equipment/device manufacturer's recommendations. All 120-volt wiring shall comply with NFPA 70.

PART 3 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

The network-ready DDC thermostat will not be connected to the existing base-wide DDC system under this renovation project.

The Contractor shall be responsible for developing design documents per information indicated on this RFP and in accordance with UFGS requirements. Submit all design documents (specifications, schematic flow diagrams, and sequence of operations) to be reviewed and approved by Government. Also, the construction submittals including technical specification data sheets, shop drawings, equipment schedules, sequences of operation, and other required documents shall reflect that the Contractor has a complete understanding of the work to be performed.

Design documents shall include the following:

1. Detailed control system scope of work and installation notes describing the various components that will be provided (network-ready thermostats, valves, etc.).
2. Control valve schedule indicating valve model number, body type, Cv factor, actual pressure drop, and valve actuator model number.
3. A detailed control diagram for fan coil unit. Diagram shall show all related control components in their respective locations, fluid flow directions, and point types (DI, DO, AI, or AO).
4. A detailed written sequence of operation for fan coil unit. Fully describe every routine (fan start/stop, temperature control, etc.).
5. Provide specification to ensure that all of the components which are expected to be used are properly specified. In addition, the specification shall also specify detailed requirements for testing and commissioning of the controls associated with fan coil units. The specification shall also include all training requirements.

D3070 SYSTEMS TESTING AND BALANCING

Provide complete Testing and Balancing (TAB) of all water distribution systems and fan coil units before and after new fan coil unit installation. Ensure that all fan coil unit condensate drains flow freely without blockage from fan coil to drain termination point.

D3080 COMMISSIONING

A. Minimum Commissioning Authority Qualifications:

1. Certification as a Commissioning Authority from a recognized organization: ASHRAE Commissioning Process Management Professional (CPMP), BCA Certified Commissioning Professional (CCP), ACG Certified Commissioning Authority (CxA), AEE Certified Building Commissioning Professional (CBCP), University of Wisconsin-Madison, National Environmental Balancing Bureau (NEBB).
2. Bachelor of Science engineering degree from an ABET accredited college or university in mechanical or electrical engineering, or registered professional engineer (P.E.).
3. At least five years of experience in performing commissioning of facilities in accordance with ASHRAE Guideline 1.

B. Summary of Commissioning Services Required:

1. The commissioning process shall be a systematic, safety, and quality focused process through design, construction, and facility acceptance. The process shall assist in the effort to provide an energy efficient and sustainable facility by documented verification that all listed building systems perform interactively according to the documented design intent and the building user's (Government's) operational needs. The commissioning process shall provide documented verification that the facility and all of its components and assemblies are planned, designed, installed,

PART 3 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

tested, and can be operated and maintained to meet the Government's project requirements, indoor air quality, moisture control requirements. The commissioning process shall take into account requirements and considerations for systems safety for the facility and all of its components and assemblies with respect to energy efficiency and environmental design.

2. The CxA shall ensure that all building energy consuming equipment performs in accordance with the Government's project requirements. The CxA shall compile and review the project's requirements for energy efficiency and environmental design for compliance with the Government's project requirements.

C. Commissioning Authority (CxA) Responsibilities:

1. Define a commissioning team, hold a commissioning kick-off/scoping meeting and identify responsibilities.
2. Review the basis of design (BOD). The CxA shall provide comments and recommendations to ensure that the BOD reflects the energy goals as well as the Government's requirements.
3. Provide CX specifications that define roles and responsibilities for the Contractor, Designer of Record, the CxA and the Government. Clearly define scheduling and documentation (submittals, RFI's, change orders, etc.) workflow responsibilities during construction as well as coordination of QC responsibilities.
4. Provide Design Reviews:
 - a. Insure Commissioning requirements for all commissioned systems are incorporated into the Construction Documents, Construction Drawings, and Construction specifications.
5. Prepare a project specific "Commissioning Plan" based on the Owner's Project Requirements (OPR), DD1391, RFP, and the Designer of Record's (DOR) BOD. The Cx Plan shall be reviewed and approved by the Government prior to implementation.
6. Ensure that commissioning activities are being scheduled into the master schedule. Verify which equipment needs to be incorporated into job schedule (e.g. if a section of the building is to be conditioned on a specific date, then the commissioning of all the HVAC equipment components, controls, and systems must be listed as a predecessor to that date.) Attend construction job-site meetings to obtain information on construction progress and coordinate commissioning activities. Review all construction meeting minutes for potential revisions or substitutions relating to the commissioning process. Assist in resolving any discrepancies. Manage commissioning meetings as needed with the design-build team.
7. Verify and document that the applicable equipment and systems are installed properly and receive adequate preoperational checkout.
 - a. Develop the Pre-Functional Checklists forms.
 - b. Use the completed Pre-Functional Checklists to verify that the applicable equipment and systems are installed properly and have received adequate preoperational checkout. Perform site visits, as necessary, to observe component and system installations. To promote tracking of construction issues the CxA shall maintain a Construction Issues Log. Backcheck comments to ensure resolution by the DOR.
12. Systems startup
 - a. Evaluate and document systems start-up, including systems safety requirements and considerations, by reviewing start-up reports and by selected site observation. Before initial startup, review all the control sequences and interlocks, and the detailed testing procedures for proper operation.
 - b. Witness the HVAC piping pressure test and flushing activities.
 - c. Witness ductwork air leakage testing (DALT) sufficiently to be confident that proper procedures are followed.
 - d. Document results in the "Summary Commissioning Report". Coordinate effort with appropriate Government representatives.
13. Functional Performance Testing (FPT)/Performance Verification Testing (PVT)
 - a. Witness functional testing of the HVAC control system and assist the Contractor evaluating its use for TAB, before TAB is executed. Coordinate effort with appropriate Government representatives.

PART 3 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

- b. Verify and document that HVAC Functional Performance Testing (FPT)/Performance Verification (PVT) procedures, including systems safety requirements and considerations, are developed and implemented as systems become ready for demonstration.
 - c. Witness, evaluate, and document results of the functional performance tests/performance verification tests performed. Insure systems operate according to design operating sequences. This evaluation may include Building Automation System (BAS) testing, energy management control system trending, stand-alone data logger monitoring, and/or manual functional testing.
 - d. Provide FPT/PVT sampling rates in accordance with UFGS 01 91 14 General Commissioning Requirements:
 - i. 100% of all central plant equipment and primary air handling unit controllers (unless otherwise directed)
 - ii. 20% sample size is allowed for identical controllers typical of terminal control equipment (i.e. VAV Terminals, fan coil units).
 - e. Witness and document execution of deferred testing and deficiency corrections.
 - f. Witness and document execution of off-season/second-season testing.
 - g. Witness, verify, and document retesting as necessary until satisfactory performance is achieved.
 - h. Coordinate effort with appropriate Government Representatives.
 - i. Review, verify, and document that the energy requirements and goals for the project requirements are met.
14. HVAC Testing, Adjusting & Balancing (TAB)
- a. Review and evaluate the HVAC Test & Balance (TAB) execution plan.
 - b. Review and verify proper execution of the air and water system balancing activities by reviewing completed TAB reports and by selected site observation.
 - c. Spot-check/verify balanced water-side and air-side components with TAB report in accordance with sampling rates identified in UFGS 23 05 93 Testing, Adjusting, and Balancing for HVAC:
 - i. 100% of major HVAC equipment (i.e. air handling units, chillers, boilers)
 - ii. 25% of repetitive HVAC equipment (i.e. VAV terminals, fan coil units)
 - d. Coordinate effort with appropriate Government representatives.
15. Warranties
- c. Provide verification and documentation of system acceptance dates for warranty period determination.
 - d. Review, verify, and document equipment warranties to ensure that the Government's responsibilities to maintain the warranties are clearly defined. Document/verify that installations are in conformance with the manufacturer's requirements to validate the warranties.
16. Provide a final "Summary Commissioning Report".

D. Systems and Components to be Commissioned:

- 1. Fan coil units
 - a. Fan coil unit control valve
 - b. Fan coil unit thermostat
 - i. Fan coil unit on, off control
 - ii. Fan coil unit fan speeds

D50 ELECTRICAL

The electrical design shall comply with the design criteria specified in UFC 3-500-10N, *Electrical Engineering*, and its referenced documents.

D5010 ELECTRICAL SERVICE & DISTRIBUTION

PART 3 – GENERAL REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

Disconnect existing fan coil units being replaced. Connect new fan coil units to existing 1P–20A breakers in existing “WESTINGHOUSE” panels (presently serving existing fan coil units) via existing branch circuit conduits. Replace existing conductors to accommodate the connection to new fan coil units. New conductors shall be copper of THWN insulation in existing electric metallic tubing (EMT) conduit, of #12 AWG minimum ampacity.

F20 SELECTIVE BUILDING DEMOLITION

Avoid disturbance of flooring as much as possible during Fan coil unit replacement.

G10 SITE PREPARATION

G1010 SITE CLEARING

Burning will not be allowed.

All grubbing and clearing residue, demolished material, rubbish and debris generated by this project shall be hauled off-site and off station by the Contractor.

-- End of Section --

THIS IS INTENTIONALLY LEFT BLANK

Part 4 Minimum Materials, Engineering and Construction Requirements

1.0 GENERAL REQUIREMENTS

The requirements indicated here are minimum performance requirements. More specific project functional and performance requirements, scope items and expected quality levels over and above the standards in Part 4 are identified in Part 3 of the Request for Proposal or Basic Ordering Agreement. The Contractor is encouraged to exceed the minimum requirements. The Contractor's performance evaluation will be based in part on enhancements to materials, engineering, design and construction provided for the contract that exceed minimum requirements.

Part 4 is a general section. Not all items in Part 4 will be required for this project. See Part 3 for project-specific requirements. See "Order of Precedence" paragraph in Part 2 for relationships between all parts of the RFP.

In general, unless otherwise indicated, Contractor shall provide all labor, equipment and materials necessary to complete the work required for the contract. All work shall be in conformance with all applicable referenced criteria, construction standards, laws and regulations, including applicable building and fire, life safety codes.

Recycled Materials Considerations:

An Affirmative Procurement Program has been established within the Federal government to promote the purchase of products containing recovered materials. This program promotes the purchase of products containing materials recovered from the solid waste stream. The intent is to conserve resources and reduce solid waste by developing markets for recycled products and encouraging manufacturers to produce quality recycled content products. The contractors shall use products that meet or exceed the EPA guideline standards for recovered content as required by the Federal Acquisition Regulations (FAR). Availability lists of manufacturers and EPA research on product usage are on the Construction Criteria Base (CCB) at <http://www.ccb.org> under Documents Library, NAVFAC Criteria. A partial list of products containing recycled materials for possible use is as follows:

- Rock Wool Insulation
- Fiberglass Insulation
- Cellulose Insulation
- Structural Fiberboard and Laminated Paperboard
- Cement and Concrete - Coal Fly Ash
- Carpet including backings and cushions
- Floor Tiles
- Reprocessed and Consolidated Latex Paint

- Crushed Concrete Aggregate for new asphalt, concrete or subgrade
- Recycled glass for terrazzo aggregate
- Acoustical Ceiling Tile
- Gypsum Wallboard
- Steel wall studs
- Cellulose spray applied fireproofing
- HDPE Toilet Partitions

1.1 MATERIALS AND METHODS OF CONSTRUCTION

Only new materials and equipment shall be installed in the work. All materials, equipment and appliances shall be of the current manufacturers' products. No obsolete or discontinued materials, equipment and appliances shall be used, except that construction materials containing recycled content as described in Paragraph 1 of this Part that completely comply with all materials specifications found elsewhere in this Part may be used.

1.2 APPLICABLE CODES AND STANDARDS

The design and construction shall be in accordance with established construction practices, and the latest revision/edition of the following referenced codes and standards. The term "Latest Revision/Edition" is defined as the version as of the project award date. References are available at www.wbdg.org/ndbm/. The advisory provisions of all codes and standards shall be mandatory, as though the word "shall" had been substituted for "should" wherever it appears. Reference to the "authority having jurisdiction" shall be construed to mean "Contracting Officer". Comply with the required and advisory portions of the current edition of the standard at the time of contract award. All work to comply with UFC 1-200-01, *General Building Requirements*, and IBC 2009 or later edition as modified by applicable NFPA Standard as well as codes and standards listed in RFP Part 2 Attachment A.

1.3 LOCATION-SPECIFIC CODES AND STANDARDS

See Part 3.

1.4 DISCREPANCIES

When discrepancies in the referenced standards and the contract requirements occur, the more stringent requirements shall govern. The word "should" in all NFPA publications shall be interpreted as a requirement. The Authority Having Jurisdiction in the interpretation of the codes and standards, and approving the exceptions allowed in the referenced standards, shall be the Contracting Officer, and the parties designated by the Contracting Officer.

2.0 PERFORMANCE TECHNICAL SPECIFICATIONS

Note: The paragraph numbers used correspond with the numbers used in UNIFORMAT II/Work Breakdown

Structures (WBS) as listed in the Whole Building Design Guide, Navy Design Build Master, accessible at this website: www.wbdg.org/ndbm.

SECTION A. SUBSTRUCTURE

A10 FOUNDATION

Foundations shall be reinforced concrete slabs-on-grade with continuous strip footings or isolated spread footings. Concrete slabs shall not be less than 4 inches in thickness and footings shall not be less than 18 inches below the lowest adjacent grade. Foundations shall be designed and constructed of reinforced concrete. All design and construction shall comply with IBC and with applicable requirements in Section B Shell. For the purposes of interpreting IBC Chapter 18, the "Owner" and "Building Official" shall mean the "Government", and the "Applicant" shall mean the "Contractor/Designer of Record".

1. **Contractor-Foundation Design:** The Designer of Record shall evaluate the RFP data, and obtain and evaluate all additional data as required to support the design and construction.
2. **Geotechnical Site Data required in Design Drawings:** The Contractor's final design drawings shall include:
 - a. Notes identifying the soil allowable bearing capacity used in design.
 - b. Subsurface soil information, be it Government provided or Contractor obtained, that represents subsurface conditions existing on the project site (such as boring logs, test pits, laboratory test results and groundwater observations). The locations of all borings shall be indicated on the drawings.
3. **Performance Verification and Acceptance Testing:** Verification of satisfactory construction and system performance shall be via Performance Verification Testing, as detailed in this part of the RFP.
 - a. **Earthwork:** Perform quality assurance for earthwork in accordance with IBC Chapter 17. See Section G1030.

SECTION B. SHELL

Building shell may be of any materials and design allowed by applicable codes and standards, subject to specific requirements that may be applicable to a particular activity, such as the base exterior architecture plan (BEAP) and UFC 4-010-01.

B10 SUPERSTRUCTURES

Superstructure work includes structural frames, bearing walls, floors, roofs, roof canopies, and balcony construction. Unless otherwise specified in Part 3, superstructures may be designed and constructed using any materials or combination of different materials allowed by applicable codes and standards. All design and construction shall comply with IBC. Special inspection, testing, approvals, certifications, observations and quality assurance plans as prescribed in Chapter 17 of the IBC are required.

1. **Concrete:** All concrete shall be constructed in accordance with ACI 301. Concrete shall have a 28-day minimum compressive strength of 3,000 psi. Slump shall be between 2 and 4 inches in accordance with ASTM C143. Provide joints as required to minimize cracking. All concrete shall be reinforced. Provide joints as required by applicable ACI standards. Unless otherwise

specified in Part 3 or as indicated by the contracting officer, provide steel trowel finish for all exposed floor surfaces.

2. **Masonry:**
 - a. All concrete masonry shall be constructed in accordance with ACI 530.1. Concrete masonry shall have a minimum 28-day compressive strength of 1500 psi. Concrete masonry units shall conform to ASTM C90, grade A1. Broken blocks are not allowed. Use only standard size and shape blocks. Block may be cut when necessary. Mortar shall be Type S.
 - b. When used, brick shall conform to ASTM C216. In exposed construction, broken brick shall not be allowed. Standard size brick may be cut to fit job condition. Use Type S mortar.
 - c. Provide metal anchors for masonry and brick, including veneer construction as required by IBC.

6. **Structural Steel:** Structural steel exposed to weathering shall be adequately protected to prevent corrosion.

7. **Steel deck:** Steel form deck shall have a G90 galvanized finish, and must have a minimum 26-gage thickness. All other steel deck shall have a G90 galvanized finish, and must have a minimum 20-gage thickness.

8. **Cold-formed metal framing:** Cold-formed steel studs, joists and track shall be galvanized with a minimum thickness of 20-gage.

9. **Wood framing:** Wood framing members shall be new lumber, unless otherwise allowed by Part 3. Timber can be Douglas Fir, Douglas Fir-Larch, Hem-Fir, Southern Pine or other structurally competent species allowed by applicable codes and standards. Wood framing shall meet the following minimum grading requirements:
 - a. Studs - #3
 - b. Joists and rafters- #2
 - c. Beams, 4x and larger - #1
 - d. Posts, 4x and larger - #1
 - e. Blocking - #3
 - f. Fascia, trim - #1
 - g. Wood Structural Panel Sheathing (Exterior Glue)
 - h. Roof - APA rated with span index of 24/0 - minimum thickness 1/2 inch
 - i. Walls - APA rated with span index of 32/16 - minimum thickness 1/2 inch
 - j. Flooring- APA rated with span index of 48/24 - minimum thickness 3/4 inch

B20 EXTERIOR ENCLOSURE

B2010 EXTERIOR WALLS

1. **Exterior Wall Performance:**
 - a. **Vapor Transmission Analysis:** Perform a job specific vapor transmission analysis in accordance with ASHRAE 90.1 or WUFI. The conclusion of the analysis shall indicate

PART 4 – MINIMUM MATERIALS, ENGINEERING, AND CONSTRUCTION REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222

WORK ORDER NO. 1327210

NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

APRIL 17, 2015

- the appropriate locations of needed vapor retarders, air barriers, and anticipated dew-point locations in the exterior enclosure during different critical times of the year.
- b. **Maximum Air Infiltration:** The air leak flow rate must not exceed 0.25 CFM at 75 Pa per square foot (0.076 cm 75 Pa per square meter) of building envelope area including roof or ceiling, walls and floor as provided by the DOR.

Where required in RFP Part 3, provide air barrier testing. Perform testing as described in "U.S. Army Corps of Engineers Air Leakage Test Protocol for Building Envelopes Version 3, May 11, 2012". Repair leaks and repeat testing until prescribed maximum air leak flow rate is achieved. Provide intermediate and final reports.

- c. **Wind Loads:** Provide wind load calculations for exterior cladding in accordance with ASCE-7 with comparative analysis of the cladding system to be provided.
- d. **Water Penetration:** No water penetration shall occur at a pressure of 39 Kg/m² (8 psf) of fixed area when tested in accordance with ASTM E 331.
- e. **Insulating Value:** Provide complete thermal envelope in accordance with ASHRAE 90.1, Chapter 5 with improvements required to meet project energy goals.

Where required in RFP Part 3, provide infrared thermal envelope performance testing. Test the building envelope using Infrared Thermography in accordance with the requirements of ASTM C1060 (latest edition) and ISO 6781. The Contracting Officer will witness the testing. Provide thermography test report including thermographs in color and a color temperature scale to define the temperature indicated by the various colors. The report shall identify the high temperature reading, the outdoor air temperature, the building indoor air temperature, and the wind speed and direction. Report to note any areas of compromise in the building envelope, and note all actions required and taken to correct those areas. Repair and repeat testing until discrepancies are demonstrated to be resolved.

2. **Masonry Veneer Exterior Wall Closure Components:** Masonry veneer shall include load bearing and non-load bearing exterior walls of the structure, and shall include colored mortar, special shapes such as sills, headers, trim units and copings of brick masonry, precast concrete, concrete masonry units, or other approved material. Utilize BIA Technical Notes to design, detail, and construct brick masonry walls. Substitute directive language in the place of BIA suggestive language. The results of these wording substitutions change this document to required procedures. The veneer shall be tied to the backup wall system with a system that allows the veneer to move independently of the backup wall system, while being structurally supported. The masonry veneer shall allow for expansion and contraction of the veneer without cracking the exterior material.
- a. **Masonry Veneer Installation:** Conform to ACI 530.1 for masonry veneer installation, including cold weather construction. Antifreeze admixtures are not to be used.
- b. **Mortar:** Provide factory-tinted colored mortar conforming to ASTM C270, unless DOR directs otherwise.
- c. **Expansion/Control Joints:** Locate expansion/control joints and seal with proper backing material and ASTM C 920 polyurethane sealant, or preformed foam or rubberized expansion joint closure. Conform to UFC 3-100-10 and BIA Technotes 18, 18A.
- d. **Brick:** shall be ASTM C216, Grade SW, type FBS, or type FBX for detail work. ASTM C67 test rating shall be "Not effloresced". Use FBA brick only for special architectural effects requiring a non-uniform size.
- e. **Split Faced or Ground Faced Masonry:** ASTM C 90
- f. **Cast Stone Trim Units:** Cast Stone shall meet or exceed the requirements of ASTM C 1364.
- g. **Wall Cavity:** shall Comply with the and BIA Technical Notes 21A, 21B, 21C, 28B
8. **Through-Wall Flashing Components:** Through-wall flashing with weep holes shall

be incorporated in cavity wall construction. Flashing shall be 7 ounce copper flashing with a 3 ounce bituminous coating on each side or a fiberglass fabric bonded on each side of the copper sheet; 16-ounce uncoated copper, 28 gauge Type 302 or 304 stainless steel is also acceptable. Flexible membrane flashing, plastic or PVC-based membrane flashing is prohibited.

- i. **Reinforcing in Veneer Layer:** Reinforcing in the veneer layer shall be galvanized in accordance with ASTM A 123/A123M, ASTM A153/A153M, or ASTM A653/A653M, Z275 (G90) coating, and be of sufficient size to eliminate damage to the veneer layer from wind and other live and dead loads imposed on the veneer layer.
- j. **Masonry Cleaning:** Clean the masonry in accordance with manufacturer's instructions and BIA Technote 20.

3. **Metal Wall Panel Exterior Closure**

Panels shall have factory applied, baked coating to the exterior and interior of metal wall panels and metal accessories. Exterior finish topcoat shall be of 70 percent polyvinylidene fluoride (PVDF) resin with not less than 0.8 mil dry film thickness (DFT). Exterior primer shall be standard with panel manufacturer with not less than 0.8 mil dry film thickness (DFT).

Wall system and attachments shall resist wind loads as determined by ASCE 7, with a factor of safety appropriate for the material holding the anchor. Maximum deflection due to wind on aluminum wall panels shall be 1/60. Maximum deflection due to wind on steel wall panels and girts behind aluminum or steel wall panels shall be limited to 1/120 of their respective spans, except that when interior finishes are used the maximum allowable deflection shall be limited to 1/180 of their respective spans.

Conformations - Non-insulated steel or aluminum wall panels shall have configurations for overlapping adjacent sheets or interlocking ribs for securing adjacent sheets and shall be fastened to framework using concealed fasteners, or choose the option for exposed fasteners when exposed fasteners are acceptable at the installation. Length of sheets shall be sufficient to cover the entire height of any unbroken wall surface.

a. **Steel Wall Panels:**

1) **Material and Coating:** Form sheets from steel conforming to ASTM A 653/A 653M, Structural Grade 40, galvanized coating conforming to ASTM A 924/A 924M, Class G-90; aluminum-coated steel conforming to SAE AMS 5036; or steel-coated with aluminum-zinc alloy conforming to ASTM A 792/A 792M, except that coating chemical composition shall be approximately 55 percent aluminum, 1.6 percent silicon, and 43.4 percent zinc with minimum coating weight of 0.5 ounce per square foot.

2) **Gage:** Minimum 22 U.S. Standard Gage for wall panels, but in no case lighter than required to meet maximum deflection requirements specified.

b. **Aluminum Wall Panels:**

1) **Material and Coating -** Form sheets of Alloy 3004 or Alclad 3004 conforming to ASTM B 209 having proper temper to suit respective forming operations.

2) **Thickness -** Minimum 0.81 mm (0.032 inch) nominal, but in no case thinner than that required to meet maximum deflection requirements specified.

- c. **Insulated Aluminum or Steel Wall Panels:** Insulated wall panels shall be steel or aluminum factory-fabricated units with insulating core between metal face sheets securely fastened together and uniformly separated with rigid spacers. Panels shall have a factory color finish. Wall panels shall have edge configurations with interlocking ribs for securing adjacent panels. System shall utilize factory fabricated corners and trim pieces at intersections with other materials. Insulated wall panels shall be fastened to

PART 4 – MINIMUM MATERIALS, ENGINEERING, AND CONSTRUCTION REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222

WORK ORDER NO. 1327210

NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

APRIL 17, 2015

framework using concealed fasteners.

1) Insulated Steel Panels - Zinc-coated steel conforming to ASTM A 653/A 653M; or Aluminum-zinc alloy coated steel conforming to ASTM A 792/A 792M, AZ 55 coating. Uncoated wall panels shall be 0.61 mm (0.024 inch) thick minimum.

2) Insulated Aluminum Panels - Alloy conforming to ASTM B209, temper as required for the forming operation, minimum 0.81 mm (0.032 inch) thick.

4. Stucco Exterior Wall Closure

- a. **Portland Cement Plaster:** ASTM C150, gray Portland cement Type II with 13 mm (1/2 inch) maximum chopped alkali resistant fiberglass strands, minimum 1.5 percent by weight to cement; .68 kg (1 1/2 pounds) per sack of cement. Lime shall conform to ASTM C206, Type S. System shall utilize stainless steel or zinc corner beads, J-beads and other accessories. Unless specifically deleted, the system shall utilize an acrylic admixture or coating to give additional moisture suppression to control fungus growth.
- b. **Exterior Insulation and Finish System (EIFS):** EIMA TM 101 and 01 EIMA TM 101.86. EIFS shall be used as the non-primary or the primary exterior finish material only for projects where it is necessary to match existing EIFS.

5. **Precast Concrete Wall Panels:** ACI 211.1 and ACI 301. PCI MNL-116 or PCI MNL-117. Concrete shall have a minimum 28-day compressive strength of 281 Kg/cm² (4000 psi). Joints shall include properly sized and placed backing material and fully loaded and tooled sealant joint of no less than 1/4 inch sealant material thickness.

6. Other Wall Finish Systems

- a. **Horizontal Wood Siding:** Horizontal Wood Siding: DOC PS 20, exterior, lap type, 6 inches wide, maximum practicable lengths, 11 mm (7/16 inch) thick, smooth face. All surfaces of wood siding and trim shall be shop coated with an alkyl primer.

Species and Grades 1. Grade 1 Common spruce-pine-fir; NELMA, NLGA, WCLIB, or WWPA. 2. Grade Prime or D finish, pressure-preservative-treated hem-fir; NLGA, WCLIB, or WWPA. 3. Grade D Select (Quality) eastern white pine, eastern hemlock-balsam fir-tamarack, eastern spruce, or white woods; NELMA, NLGA, WCLIB, or WWPA. 4. Grade D Select northern white cedar; NELMA or NLGA. 5. Grade B & B, pressure-preservative-treated southern pine; SPIB.

- b. **Vinyl Siding System:** Integrally colored, vinyl siding complying with ASTM D 3679.
- c. **Manufactured Faced Panels Systems Exterior Wall Siding:** Glass Fiber Reinforced Cementitious Panels System: Siding made from fiber-cement board that does not contain asbestos fibers; complies with ASTM C 1186, Type A, Grade II; horizontal or vertical pattern in plain or beaded-edge style. Texture: Rough sawn or smooth, factory primed.

7. Exterior Wall Backup Construction

- a. **Concrete Unit Masonry:** Provide concrete unit masonry to comply with ACI 530.1. Load-bearing units: ASTM C90, Non-load bearing- units: ASTM C129, Type I or II. Provide ground face units, split-faced units, ground-faced units, or split-ribbed units for exposed exterior walls. Provide water repellent admixture to masonry units where the exterior face of the units will not receive a waterproof coating such as paint
- b. **Dampproofing:** Dampproof the cavity-facing wythe of the backup masonry using asphaltic primer according to ASTM D 41, if dampproofing is not provided by a sprayed on foam or other DOR-approved membrane insulation system.

8. Load-Bearing Metal Framing System

PART 4 – MINIMUM MATERIALS, ENGINEERING, AND CONSTRUCTION REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222

WORK ORDER NO. 1327210

NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

APRIL 17, 2015

If permitted, provide load-bearing metal framing including top and bottom tracks, bracing, fastenings, and other accessories necessary for complete installation. Framing members shall have the structural properties indicated. Where physical structural properties are not indicated, they shall be as necessary to withstand all imposed loads. Design framing in accordance with AISI SG-673. Installation shall be in accordance with DOR-approved shop drawings and manufacturer's installation instructions.

9.	Exterior Studs: Max. Deflection Criteria	Exterior Finish
L/360		Cement Plaster, Wood Veneer, Synthetic Plaster, Metal Panels
L/600		Brick Veneer, Stone Panels

Wall deflections shall be computed on the basis that studs withstand all lateral forces independent of any composite action from sheathing materials. Studs abutting windows or louvers shall also be designed not to exceed 1/4-inch maximum deflection and as required in UFC 4-010-01.1) Studs - ASTM A 1003/ASTM A 1003M, Structural Grade 50, Type H minimum; provide Z180 (G60) galvanized coating in accordance with ASTM A 653/ASTM A 653M. Do not expose studs to direct moisture contact2) Bracing - Provide horizontal bracing in accordance with design calculations and AISI SG-673, consisting of, as a minimum, runner channel cut to fit between and welded to the studs.3) Sheathing - Provide sheathing to withstand structural loads imposed on the wall structure. Cover sheathing with either a 15 pound asphalt-impregnated building paper, or air barrier as required by the wall moisture analysis. Sheathing shall be one of the following:
a) Plywood: C-D Grade, Exposure 1; b) Structural-Use and OSB Panels; c) Gypsum: ASTM C 79/C 79M and ASTM C 1177/C 1177M, 13 mm (1/2 inch) thick fire retardant (Type X) 15 mm (5/8 inch) thick; 1.2 meters (4 feet) wide with square edge for supports 400 mm (16 inches) o.c. with or without corner bracing of framing. Gypsum sheathing shall be faced with materials capable of resisting six months of weathering exposure without degradation of the covering or the gypsum. Seal all joints as recommended by the manufacturer.

10. **Wood Framing System:** All materials shall be kiln-dried lumber complying with DOC PS 20. Installation shall be in accordance with AF&PA T11. System shall use preservative pressure treated lumber at sill plates and other members in contact with concrete and masonry surfaces.
 - a. **Species and Grades:** Provide species and grades listed: 1) Grade 2 Common spruce-pine-fir; NELMA, NLGA, WCLIB, or WWPA; 2) Grade 2 Common, hem-fir; Douglas-fir; NLGA, WCLIB, or WWPA; 3) Grade 2 Common, southern pine; SPIB.
 - b. **Sheathing:** Sheathing shall withstand structural loads imposed on the wall structure. Cover sheathing with either a 15 pound asphalt-impregnated building paper, or air barrier as required by the wall moisture analysis. Sheathing shall be as for Metal Studs.
11. **Cast-in-place Concrete System:** Concrete construction must be in accordance with ACI 301.
12. **Insulation and Vapor Retarder:** Insulation, Vapor Retarders, and Air Barrier Systems in or on Exterior Enclosure shall include: insulation, liquid, sheet or continuous film materials installed separately in or on wall assemblies to provide resistance to heat loss/gain, and vapor penetration.
 - a. **Vapor retarder:** Comply with ASTM C755. Incorporate in the exterior wall system where required by vapor transmission calculations or dew point analysis indicates the need or in conditions of high moisture exposure.
 - b. **Bituminous Dampproofing:** Bituminous Dampproofing shall be ASTM D449, Type I

PART 4 – MINIMUM MATERIALS, ENGINEERING, AND CONSTRUCTION REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222

WORK ORDER NO. 1327210

NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

APRIL 17, 2015

or Type II bituminous dampproofing on the exterior surface of the interior wythe of masonry in a cavity wall (back-up wall for masonry veneer).

- c. **Building Paper:** FS UU-B-790, Type I, Grade D, Style 1.
 - d. **Air Barrier:** Building wrap consisting of air barrier sheeting complying with ASTM E 1677, Type 1, not less than 3 mils thick with a permeance of not less than 575 ng/Pa x s x sq.m. (10 perms). Building wrap shall have a flame spread index of less than 25 in accordance with ASTM E 84. Provide building wrap over sheathing of wood or metal framed construction to reduce air penetration and airborne vapor penetration. Provide building wrap tape as recommended by the manufacturer for sealing all joints in the building wrap. Installation shall be in accordance with manufacturer's instructions. Air barrier installation at windows shall be in accordance with ASTM E 2112.
 - e. **Insulation Systems:** Vertical and horizontal polystyrene insulation conforming to ASTM C578 or rigid polyisocyanurate board wall insulating products conforming to ASTM C591 or mineral-fiber blanket insulation conforming to ASTM C 665 shall be provided.
13. **Parapets:** Avoid parapets when possible, but when necessary, provide parapets with the same materials as the exterior wall construction. Provide scuppers and wall edge according to SMACNA.
14. **Exterior Louvers and Screens:** If required, provide louvers for Screened Equipment Enclosure or as louvers for exterior doors.
- Storm shutters shall comply with ASTM E 1996-03.
15. **Balcony Walls and Handrails:** Balcony walls to match exterior construction. Handrails to comply with the IBC and OSHA.
16. **Exterior Soffits:** Exterior soffit system.
17. **Exterior Painting and Special Finishes;** All painting and coating materials shall be low VOC. Painting practices shall comply with applicable federal, state and local laws enacted to insure compliance with Federal Clean Air Standards. Apply coating materials in accordance with SSPC PA 1. SSPC PA 1 methods are applicable to all substrates.
- All paint shall be in accordance with the Master Painters Institute (MPI) standards for the exterior architectural surface being finished. The current MPI, "Approved Product List" which lists paint by brand, label, product name and product code as of the date of contract award, will be used to determine compliance with the submittal requirements of this specification. Provide paint systems tested to "Detailed Performance Level" standard as defined by MPI.
18. **Exterior Joint Sealant:** Sealant joint design, priming, tooling, masking, cleaning and application shall be in accordance with the general requirements of Sealants: A Professionals' Guide from the Sealant, Waterproofing & Restoration Institute (SWRI). All sealant shall conform to ASTM C 920.
19. **Sun Control Devices:** Sun control devices shall be manufactured devices to provide sun control on exterior windows and storefronts. Sun control devices shall be designed and installed to withstand the wind loads prevailing at the project site.

B2020 EXTERIOR WINDOWS

All windows and doors in new or existing buildings, which are subject to Anti-terrorism Standards, must be blast-resistant as prescribed in UFC 4-010-01.

Unless otherwise allowed by Part 3, windows for new facilities shall be aluminum. In building additions or renovations windows shall match existing window materials. Exterior windows design, dimension, and construction shall meet or exceed the requirements for Anti Terrorism Force Protection requirements. In addition, exterior windows shall meet or exceed Energy Star requirements. The design and placement of exterior windows shall take into considerations view, natural light, privacy, and protection for the occupants of the facilities. Provide operable hardware and insect screen for exterior windows. Windows shall be fabricated by manufacturers normally involved in the manufacturing of windows and shall be of the current make and model. No obsolete or discontinued windows shall be used. Provide weather stripping, STC and IIC rating, commensurate with the intended use of the facility. Submit catalog information and manufacturer's specifications for approval by Contracting Officer prior to purchase of windows.

All window assemblies shall meet performance grade CW tested in accordance with AAMA/WDMA/CSA 101/I.S.2/A440-08 or most current edition of this standard.

Where windows separate conditioned spaces from non-conditioned spaces, provide windows bearing NFRC energy label indicating window exceeds current EnergyStar criteria. For storefront or curtainwall systems, provide thermally broken framing and insulating glazing with whole-assembly U-value of 0.40 or less. Provide windows exceeding requirements of ASHRAE 90.1, Table 5.5 for project climate zone.

Windows shall consist of fixed and operable sash used singly and in multiples. Provide operable sash in spaces occupied by people as a minimum. Include operating hardware, non-corroding framed metal screens for operable sash, integrated blinds set between glass panels and security grilles. Provide jamb support for larger windows where recommended by manufacturer.

1. **Metal Windows:** All windows shall conform to ANSI/AAMA/WDMA 101. Metal windows with insulating glass shall have thermally broken frames and sash. Factory finish aluminum windows and provide with aluminum frame screens with aluminum mesh at operable sash, hardware and locks, and tinted glazing. Aluminum screens shall comply with ANSI/SMA 1004.
2. **Wood Windows:** Clad wood and wood windows shall consist of complete units including sash, glass, frame, weatherstripping, insect screen, and hardware. Window units shall meet the requirements of AAMA 101, except maximum air infiltration shall not exceed 0.30 CFM per linear foot of sash crack when tested under uniform static air pressure difference of 7.66 Kg/m² (1.57 psf).
3. **Storefronts:** Provide one-story storefront system fabricated from formed and extruded aluminum and glass components for exterior use. Utilize the specific section of the Standard Design-Build Performance Technical Specifications Section B202002 for the storefront to be provided. Storefront framing shall meet or exceed the structural requirements, as measured in accordance with ANSI/ASTM E330: Design system to withstand this as a minimum and comply with design pressure established within the required ASCE 7-05 Wind Speed Calculations determined by the overall average opening within the project.
4. **Glazing:** All exterior glazing shall be insulating glass.
 - a. Clear Glass - Type I, Class 1 (clear), Quality q4 (A);
 - b. Heat-Absorbing Glass - ASTM 1036, Type I, Class 2 Quality q3 (select) ray frames;
 - c. Wire Glass - Type II, Class 1, Form 1, Quality q8 Mesh m1 or Form 2, Quality q7;

- d. Laminated Glass - ASTM 1172, total thickness shall be nominally 6 mm (1/4 inch);
- e. Insulating Glass Units - Typically ASTM C 1036, Type I, Class 1, Quality q4, minimum 6 mm;
- f. Tempered Glass - ASTM C 1048, Kind FT (fully tempered);
- g. Patterned Glass - ASTM 1036, Type II, Class 1 (translucent), Form 3 (patterned), Quality q7 (decorative), Finish f1 (patterned one side), Pattern p2 (geometric) 5.55 mm (7/32 inch) thick.

B2030 EXTERIOR DOORS

Exterior doors shall be heavy duty insulated steel doors and frames for service access. Door frames shall have welded corners. Use heavy-duty overhead holder and closer to protect doors from wind damage. Steel shall have G60 galvanized coating in accordance with ASTM A 924/A 924M and ASTM A 653/A 653M when the job site is located within 300 feet from a body of salt water. Provide commercial quality, coating Class A zinc coating in accordance with ASTM A591 for other steel or steel skin hollow metal doors at other locations. Provide kickplates on the inside face of all exterior doors. Weather-protect all exterior doors and related construction with low infiltration weatherstripping and sealants. Provide threshold with offset to stop water penetration while maintaining accessibility compliance. Conform to the design criteria of ASCE 7. See the hardware schedule for door hardware requirements.

Where doors separate conditioned spaces from non-conditioned spaces, provide doors exceeding current EnergyStar criteria. For storefront entrances, provide thermally broken door framing and insulating glazing with whole-assembly U-value of 0.67 or less. Provide doors exceeding requirements of ASHRAE 90.1, Table 5.5 for project climate zone.

1. **Steel Doors:** Exterior doors shall comply with ANSI A250.8-1998 (SDI-100). Hardware preparation shall be in accordance with ANSI A250.6. Doors shall be hung in accordance with ANSI A115.16.
 - a. Doors Required:
 - 1) Standard Duty Doors - Level 1, MSG # 20 (IP 0.032", 0.8 mm), physical performance Level C, Model 1 or 2.
 - 2) Heavy Duty Doors - MSG # 18 (IP 0.042", 1 mm), physical performance Level B, Model 1 or 2.
 - 3) Extra Heavy Duty Doors - Level 3, MSG #16, (0.053", 1.3 mm) physical performance Level A, Model 1, 2, or 3.
 - 4) Maximum Duty Doors - Level 4 (IP 0.067", 1.6 mm), physical performance Level A, Model 1 or 2.
 - b. Insulated steel doors and frames are required for entrances to dwelling units, and may also be specified as a Contractor's option to Level 1 standard hollow metal doors. Do not use wood doors for exterior doors, unless they are fully protected from the elements, an exterior grade species, and specially finished. If wood doors are used, provide in accordance with Standard Design-Build Performance Technical Specification Paragraph B203001 2.
2. **Standard Steel Frames;** ANSI A 250.8. Form frames with welded corners for installation in exterior walls. Form stops and beads of 20 gage steel. Frames shall be set in accordance with ASTM A250.11. Anchor all frames with a minimum of three jamb anchors and base steel anchors per frame, zinc-coated or painted with rust-inhibitive paint, not lighter than 18 gage.

PART 4 – MINIMUM MATERIALS, ENGINEERING, AND CONSTRUCTION REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222

WORK ORDER NO. 1327210

NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

APRIL 17, 2015

Mortar infill frames in masonry walls, and infill with gypsum board compound at each jamb anchor in metal frame walls. Only use surface exposed bolted anchors in concrete walls.

3. **Door and Frame Finishes:** a) Exterior Doors, Factory-Primed and Field Painted Finish - Doors and frames shall be factory primed with a rust inhibitive coating as specified in ANSI A250.8. Factory prime doors on six sides of the door; b) Exterior Doors Galvanized Finish -- Shall be Commercial Quality, Coating Class A, zinc coating in accordance with ASTM A 591 when facility is located further than 91 meters (300 feet) from the ocean. When facility is located within 91 meters (300 feet) of the ocean, provide G60 galvanized coating in accordance with ASTM A 924/A 924M and ASTM A 653/A 653M.
4. **Upward Acting Doors:** Upward acting doors shall be capable of withstanding the design wind loading of ASCE 7. Provide galvanized steel tracks not lighter than 14 gage for 50 mm (2 inch) tracks and not lighter than 12 gage for 75 mm (3 inch) track. Provide a positive locking device and cylinder lock with two keys on manually operated doors.
5. **Overhead and Roll-up Doors:** Large exterior overhead and roll-up doors system shall consist of manual or automatic exterior doors and door assemblies.
6. **Rolling Service Doors and Grilles:** Coiling overhead doors shall have minimum 22 gage thermal insulated slats. Electric operators shall have three-button switches conforming to NEMA MG 1, NEMA ICS 1, and NEMA ICS 2, and auxiliary hand chain operation, weather-stripping and wind-locks. Doors shall be capable of withstanding the design wind loading of ASCE 7 and still operate normally. Finish of the door shall be hot-dipped galvanized with a painted finish.
7. **Sectional Overhead Doors:** Sectional overhead doors shall conform to NAGDM 102, Residential or Commercial or Industrial door standards. If doors are electrically operated, pushbuttons shall be full-guarded to prevent accidental operation, and include limit switches to automatically stop doors at the fully open and closed positions. Limit switch positions shall be readily adjustable.
8. **Hardware:** Provide the services of a Certified Door Hardware Consultant to prepare the door hardware schedule.

Provide all new hardware with satin chrome finish throughout. Hardware shall be commercial grade, suitable for the operational requirements and in compliance with life safety code and handicapped accessibility requirements, similar in quality to the hardware shown in C1020 Interior Doors and Hardware below.

Coordination: Provide a master keying system compatible with the existing base system. Provide an emergency access key box for exterior door fireman key access. Coordinate with the local authority and the Contracting Officer to determine the local requirements for hardware, keying and master keying.

B30 ROOFING

For repair of existing roofing, the cutting of the existing roof shall be kept to a minimum and, where necessary, shall be made in a clean and orderly manner to prevent the appearance of a patch.

Repair all damage to existing and new roofing caused by the work of this Contract at no additional cost to the Government. The work shall be executed in such a manner as to maintain the integrity of the existing roofing manufacturer's warranty.

1. **Pre-Roofing Conference:** Prior to beginning roofing work, the Contractor shall hold a Pre-Roofing Conference with the personnel directly responsible for the roofing systems work, as well as the roofing manufacturer's technical representative.
2. **Roof Design Assurance:** If the roofing project is significant (Significant Roof - A single or group of buildings greater than 1,400 m² (15,000 sf)), or where extenuating circumstances of the roof project such as building use, content, safety, or visibility require a roofing consultant, the Contractor shall utilize the services of a Registered Roof Consultant (RRC) certified by the Roof Consultant Institute, or a Registered Professional architect or Engineer who specializes in roofing, to approve the roof design. The roof consultant must be engaged in roofing design and roofing construction as his primary endeavor. The roof consultant shall verify in writing that the design for the project is in accordance with the current edition of *NRCA Roofing and Waterproofing Manual*, UFC's, and RFP, and standard industry practices and building codes.

If a Roof Design Assurance Consultant is needed, consider using a Registered Roof Observer as a QC specialist.

B3010 ROOF COVERINGS

Roof coverings and procedures shall comply with the requirements of UFC 3-110-03, *Roofing*, and NRCA, *Roofing and Waterproofing Manual* found at <http://www.nrca.net/rp/technical/manual/manual.aspx> as the primary NAVFAC roofing criteria. Roof selection shall comply with UFC 3-330-02A, *Design: Commentary on Roof Systems*. Determine wind uplift using wind speed in accordance with ASCE-7.

1. **STEEP SLOPE ROOF SYSTEMS:** Steep slope systems shall be roofs with a pitch greater than 3 in 12. Steep Slope Systems are slate roofing, Asphalt Shingles, Roof Tiles, Foam Set Tiles, Metal Roof Panels (Architectural Standing Seam Metal Roofs on supported substrate), and Structural Standing Seam Metal Roof (SSSMR). Asphalt shingles can only be used for residential construction and light commercial construction.
2. **LOW SLOPE ROOF SYSTEMS:** Low slope systems shall be roofs with a pitch 3 in 12 or less. Low slope roofing systems shall be built-up asphalt roofing (aggregate surfaced, with modified bituminous components), modified bituminous membrane roofing of a minimum of 3 plies with aggregate surface or granular surface modified bitumen cap sheet, or structural standing seam metal roofing. Use epdm systems only to match existing construction.
3. **ROOF COMPONENTS:**
 - a. **Insulation:** For existing structures, provide insulation in accordance with ASHRAE 90.1. For new construction, provide R-30 insulation in the ceilings, attic spaces and soffit areas for interior spaces. Injected polyurethane and Urea Formaldehyde Foam field applied shall not be used. Provide acoustical insulation above walls separating bathroom/restrooms and corridor and adjacent occupied spaces, and between offices and corridors. Insulation shall have a minimum sound attenuation rating of STC-55.

Insulation shall be Polyisocyanurate Rigid Board Insulation , Mineral Fiber Blanket Insulation to conform to ASTM C 991, with Glass Mat Gypsum Roof Board for use

PART 4 – MINIMUM MATERIALS, ENGINEERING, AND CONSTRUCTION REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222

WORK ORDER NO. 1327210

NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

APRIL 17, 2015

above the deck or insulation conforming to ASTM C 1177/C 1177M, where necessary.

Only on portions of the roof where the sloping of structure does not allow the minimum slopes, provide a factory tapered roof insulation system to provide positive drainage of roof system, and to include drainage around curbs, penetrations, and projections through the roof plane.

Provide Glass Mat Protection Board meeting ASTM C 1177 for use as a thermal barrier (underlayment) or protection board for hot-mopped applications.

- b. **Vapor Retarder:**-Determine the need and location in the roof assembly for a vapor retarder. Where the mean January temperature is 40 degrees Fahrenheit or less, and the expected interior relative humidity is 45% or greater, use a vapor retarder. Otherwise, use ASHRAE 90.1 for the determination.
- 1) Vapor Retarders as Integral Facing - Alloy conforming to ASTM B 209, or Vapor Retarders Separate from Insulation - Vapor retarder material shall be 10 mil polyethylene sheeting conforming to ASTM D 4397.
 - 2) A slip sheet is required to separate the roofing panels from the insulation facing where the facing would be in direct contact with the roofing panels. If a slip sheet is necessary for use with a vapor retarder, use a 5 lb. per 100 square feet rosin-sized, unsaturated building paper.
- c. **EPDM Rubber Boots:** Flashing devices around pipe penetrations shall be flexible, one-piece devices molded from weather-resistant EPDM rubber.
- d. **Prefabricated Curbs and Equipment Support:** Provide Prefabricated curbs and equipment supports shall be of structural quality, hot-dipped galvanized or galvanized sheet steel, factory primed and prepared for painting with mitered and welded joints. Integral base plates and water diverter crickets shall be provided. Minimum height of curb shall be 8 inches above finish roof.
- e. **Fasteners:** Shall meet all requirements of the NRCA and Factory Mutual
- f. **Wood Nailers:** Wood nailers shall be pressure-preservative-treated in accordance with AWPA M2 Standards, permanently marked or branded, and installed flush with the top of the adjacent insulation board.
- g. **Flashing and Sheet Metal:** Provide flashing and sheet metal work including scuppers, splash pans, and sheet metal roofing. Flashing and sheet metal shall be provided in accordance with roof manufacturer's printed installation instructions and in compliance with NRCA and SMACNA recommendations. Fabricate Flashing and sheet metal components from Copper, Lead-Coated Copper sheet, Steel Sheet, Zinc-Coated (Galvanized) - ASTM A 653/ A 653M, Stainless Steel - ASTM A 167, Type 302 or 304, 2D finish, or Pre-Finished Aluminum.
- h. **Gutters and Downspouts:** Provide gutters and downspouts compatible with roofing material and finish. Concealed (interior) gutters and downspouts are prohibited. Provide splash guards at points of discharge.
- i. **Roof Openings and Supports:** Provide flashings for roof openings and supports as recommended by the NRCA. Assure all penetration flashings extend minimum 200 mm (8 inches) above the finished roof surface.
- j. **Roof Hatches:** Provide roof hatch where required by OSHA, and as access to roof when roof mounted equipment is used or other routine roof maintenance is required.
- k. **Glazed Roof Openings:** Skylights and other glazed roof openings shall be used only to supplement interior lighting levels (generally in steep slope or vertical applications), and otherwise, are discouraged from use.
- l. **Guards:** Provide rails or guards as required by the OSHA, the International Building Code or other applicable safety standards.
- m. **Traffic Pads:** Provide on roof system to protect roof from foot traffic. Provide traffic

pads around roof mounted mechanical equipment and underneath removable mechanical equipment access panels. Traffic pads shall be of compatible material to roof.

4. **OTHER ROOFING**

- a. **Lightning Protection:** Lightning protection component penetrations and attachments shall be sealed and flashed and anchored in a permanent manner and in a manner to avoid the degradation of the watertight integrity of the roof system.
- b. **Roof Drains (Existing):** Where existing roof drains are to be reused in roof replacement construction, the contractor shall provide new, compatible flashing materials, a new drain clamping ring and new bolts for anchorage. Reuse of existing clamping ring and bolts is unacceptable.

SECTION C. INTERIORS

C10 INTERIOR CONSTRUCTION

C1010 PARTITIONS

1. **Fixed Partitions:** wood frame; light gage steel frame; concrete masonry complying with ACI 530.1/ASCE 6/TMS 602 and associated ASTM Standards; or cast-in-place concrete complying with UFC 1-200-01, ACI 117 and ACI 301/301M. In addition, interior partitions shall comply with tables for sound isolation and noise reduction in Chapter 1, "Architectural Graphic Standards". Include a statement of adherence to the applicable criteria.

Gypsum board/stud partitions may be standard gypsum board, moisture resistant, or impact resistant. Use cement board in showers and other wet areas. Reinforce points where doorknobs can strike a wall and anchorage points for wall mounted equipment.

2. **Demountable or Removable Partitions:** shall be of materials allowed by code and shall be anchored firmly to the structure to carry their own weight as well as impact forces and seismic lateral forces. Sound Transmission Class (STC) rating and Impact Isolation Class (IIC) rating shall be in accordance with ASTM E 90 or ASTM E 413 for frequency data, and shall meet the requirements of the intended use in Part 3.
3. **Glazed Partitions and Interior Windows:** shall be of the materials allowed by code IBC, and shall comply with fire and smoke separation requirements. Provide safety glazing and fire resistant rating where they are required.

C1020 INTERIOR DOORS

1. **Wood Doors:** Stile and rail wood doors shall be WDMA I.S.6A-01, premium or custom grade, heavy duty or extra heavy duty. Flush wood doors shall be WDMA I.S.1A-04, premium or custom grade, heavy duty or extra heavy duty; or WDMA I.S.-97 (PC-5 5-ply particleboard core or SCLC-5 5-ply structural composite lumber core). Doors adjacent to paneling or millwork shall comply with corresponding AWI millwork grade. Provide interior fire doors.

PART 4 – MINIMUM MATERIALS, ENGINEERING, AND CONSTRUCTION REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222

WORK ORDER NO. 1327210

NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

APRIL 17, 2015

2. **Steel doors:** shall be ANSI A 250.8, Level 1, (occasional use, low abuse types such as closet doors without locks); Level 2, (low use, moderate abuse types such as office/storeroom doors); Level 3, (moderate use, high abuse types such as BEQ sleeping room doors); Level 4, (high use, high abuse types such as corridors, stairways, assembly spaces, and main entry doors), with a physical performance level of 'A'. Maximum door undercut shall not exceed 19 mm (3/4 inch).
3. **Sound Insulated Doors and Frames:** Utilize Sound Insulated Doors and Frames with sound control weatherstripping in rooms requiring wall assemblies to be sound insulated with a Sound Transmission Class (STC) rating as required. The STC rating for the door and frame assembly shall be not less than the wall assembly STC rating.
4. **Aluminum Doors and Frames:** Provide swing-type aluminum doors and frames complete with framing members, transoms, side-lites, and accessories. Fabricate of ASTM B 221, Alloy 6063-TS for extrusions.
5. **Steel Door Frames:** ANSI A 250.8. Form frames with welded corners for installation in masonry partitions and knock-down field assembled corners for installation in metal stud and GWB partitions. Frames shall be set in accordance with SDI 105. Form stops and beads with 20 gauge steel.

Provide a minimum of three jamb anchors and base steel anchors per frame, zinc-coated or painted with rust-inhibitive paint, not lighter than 18 gauge. Secure frames to previously installed concrete or masonry with expansion bolts in accordance with SDI 11-F. Provide mortar infill of frames in masonry walls, and gypsum board compound infill at each jamb anchor in metal frame walls.
6. **Fire doors:** Provide in conformance with NFPA 80 and NFPA 105. Fire doors and frames shall bear the label of UL, FM or WHI attesting to the rating required. Door and frame assemblies shall be tested for conformance per NFPA 252 or UL 10B (for neutral pressure) or UL 10C (for positive pressure). Wood fire doors shall also comply with ASTM E 152.

Provide stainless steel astragals complying with NFPA 80 for fire-rated assemblies and NFPA 105 for smoke control assemblies.
7. **Interior Door Hardware:** Provide the services of a certified door hardware consultant to prepare the door hardware schedule. Unless otherwise noted, interior doors shall include latch, hinges, door stops and door silencers. Provide closers and kick plates for fire-rated, corridor, stairway and high-use non-residential doors.
 - a. **Hinges** - BHMA A156.1, Grade 1, 108 x 108 mm (4 1/2 x 4 1/2 inches) with non-removable pin or anti-friction bearing hinges.
 - b. **Locks and Latches** - For non-residential buildings use Series 1000, Operational Grade 1, Security Grade 2 for stairways, building entrances, corridors, assembly spaces, and other high use interior doors. Use Series 4000, Grade 1 for non-residential locations not using Series 1000 hardware. For residential buildings use Series 4000, Grade 2 for interior doors. a) Mortise Locks and Latches - BHMA A 156.13, Series 1000, Operation Grade 1, Security Grade 2. b) Bored Locks and Latches - BHMA A 156.2, Series 4000, Grade 1, or Grade 2.
 - c. **Exit Devices** - BHMA A 156.3, Grade 1. Touch bars shall be provided in lieu of conventional crossbars and arms. Use manufacturer's integral touch bars in aluminum storefront doors.

PART 4 – MINIMUM MATERIALS, ENGINEERING, AND CONSTRUCTION REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222

WORK ORDER NO. 1327210

NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

APRIL 17, 2015

- d. **Card Key Access** - Provide card key type access units for specialized entries. Provide lithium battery powered, magnetic stripe keycard locksets that are ANSI/BHMA A156.13, Series 1000, Grade 1, mortise or ANSI/BHMA A156.2, Series 4000, Grade 1, cylindrical locks, tamper resistant, UL listed with 25 mm (1 inch) throw deadbolt, 19 mm (3/4-inch) throw latch bolt, auxiliary dead-locking latch, and 68.75 mm (2-3/4 inch) backset.
- Provide hardware keying compatible with the existing base-wide keying system. Replacement interchangeable cores shall be compatible with the Best Lock system.
- e. **Key Cabinet:** Provide a Key Cabinet with 30% over capacity.

C1030 SPECIALTIES

1. **Compartments, Cubicles, & Toilet Partitions:** FS A-A-60003. Provide toilet compartments at multi-fixture toilet rooms of Type I, Style B-Ceiling Hung, C-Overhead Braced, or F-Overhead braced-alcove. Reinforce panels to receive partition-mounted accessories. Urinal screens shall be FS A-A-60003. Type III, Style A, floor supported and wall hung or Style D, wall hung. Wall hung urinal screens shall be secured with continuous flanges to urinal screen and wall. Steel and Plastic toilet partitions shall have a recovered materials content of 20 to 30 percent. Chrome-plated or stainless steel door latches and coat hooks. Provide one coat hook per compartment door. Latches and hinges for handicapped compartments shall comply with UFAS & ADAAG.
2. **Toilet and Bath Accessories:** Provide toilet and bath accessories and install per ADAAG and manufacturers' requirements.
3. **Marker Boards and Tack Boards:** Provide porcelain enamel marker boards fused to a nominal 28 gauge steel sheet and tack boards of cork, with a tensile strength of at least 40 psi when tested according to ASTM F 152, with woven or vinyl covering.
4. **Identifying Devices:** All interior doors shall have an identifying device. All handicap accessible facilities shall utilize signage which meets current ADAAG requirements with regard to Braille, raised characters, finishes (contrast), size and mounting height. If room names are subject to frequent change, provide an interchangeable strip to be utilized to facilitate removal and replacement.
5. **Lockers:** Provide lockers to meet FS AA-L-00486 (Rev J), enameled steel with special bases.
6. **Shelving:** Provide steel shelving.
7. **Counters:** Provide solid plastic or plastic laminate counter tops and back splashes, AWI Custom grade.
8. **Cabinets:** Provide cabinetry and millwork items with associated accessories and hardware. Cabinetry shall be AWI premium or custom grade and have concealed hinges with adjustable standards for shelves.
9. **Casework:** Provide all built-in premanufactured metal cabinetry for specialized functions such

as laboratories, libraries, medical and dental facilities. Casework shall comply with Mil Std 1691.

10. **Closets:** Provide premanufactured or millwork closets or prefabricated coat closets
11. **Fire Extinguisher Cabinets:** Provide fire extinguisher cabinets. Size and locate fire extinguisher cabinets to encase extinguisher as required by NFPA 10 & 101. Fire extinguishers will be provided by the Customer.
12. **Firestopping Penetrations:** Provide all sleeves, caulking, and flashing for firestopping penetrations.
13. **Entrance Floor Grilles and Mats:** Provide recessed pan or surface floor mats at main only or all building entrances.
14. **Ornamental Metal Work:** Provide ornamental metalwork
15. **Other Interior Specialties:** Motorized projection screen shall be wall or ceiling or above-ceiling mounting. Pull-down projection screens shall be provided in lieu of motorized projection screens as approved by the Activity.

C20 STAIR CONSTRUCTION

Provide interior and exterior stair construction. Stair design, materials and construction shall comply with IBC, and applicable codes and standards, including NFPA 101. Provide refuge area at top of stair in accordance with applicable Americans with Disability Act Design Guide requirements.

C30 INTERIOR FINISHES

C3010 WALL FINISHES

Unless otherwise noted in the RFP, primary wall finishes shall be painted gypsum wall board. Provide fire resistive construction and finishes for fire separation between areas of the building in accordance with the latest adopted version of the IBC, and NFPA 101. Provide water resistant cementitious board at floors and walls of tubs and showers.

1. **Ceramic Tile:** Provide ceramic tile wall systems as defined in the Tile Council of America (TCA) handbook for ceramic tile installation and materials for the service requirements listed. Provide installation and materials in accordance with ANSI A108/A118 series standards, except do not use organic adhesives. Provide manufacturer's full range of colors and styles. Tile shall be a minimum of one grade above base grade. Coordinate with ceramic bath accessories for modularity. Include all trim pieces, caps, stops, and returns to complete installation.
2. **Wallcovering:** Vinyl wallcovering shall conform to ASTM F793, Category V Type II, 371 g to 624 g (13.1 to 22 ounces) total weight per square yard and width of 1370 mm (54 inches). Provide ASTM F793, Category VI, Type III, 624 g (22 ounces) and above to cover rough textured walls such as masonry. High performance fabric wallcovering shall be woven or non-woven Class A, fire resistive material, a minimum of 1219 mm (48 inches) wide, with a soil repellent finish and a

minimum of 340 g (12 ounces) per square yard exclusive of backing. "Tackable" wall covering shall be "self-healing" from tack penetration through the covering into the substrate. Acoustical wallcovering shall be textured, woven or non-woven, Class A fire resistive material with an acrylic backing, a minimum of 1219 mm (48 inches) wide and a minimum of 454 g (16 ounces) per square yard. The material shall have an NRC rating of .15 on gypsum board in accordance with ASTM C423. Do not install wall covering on interior face of exterior walls.

C3020 FLOOR FINISHES

Provide new flooring materials as required. All flooring materials, adhesives, finish coats, sealers and mortar materials shall meet or exceed EPA requirements for toxic substance content restrictions and air quality requirements; and shall meet or exceed fire protection requirements, such as smoke and flame spread requirements. When laying broadloom carpets and resilient flooring, use the widest sheet materials available to avoid or minimize the number and extent of seams. When seams are required, locate seams at infrequent traffic areas. Contractor is required to submit seam layout to Contracting Officer for approval prior to installation.

1. **Ceramic Tile:** Provide ceramic tile floor systems as defined in the Tile Council of America (TCA) handbook for ceramic tile installation and materials for the service requirements listed. Provide installation and materials in accordance with ANSI A108/A118 series standards, except do not use organic adhesives. Provide manufacturer's full range of colors and styles. Tile shall be a minimum of one grade above base grade.

Provide ceramic or porcelain tile with a minimum breaking strength of 202kg (300 pounds), ASTM C648, and a maximum absorption rate of 0.5%, ASTM C373. Tile shall have a minimum coefficient of friction (wet and dry) of 0.6, ASTM C1028.

2. **Resilient Flooring:** Shall meet or exceed applicable ADA horizontal requirements, and shall be installed per manufacturer's recommended methods and adhesives. Provide manufacturers full line of color and pattern selections, including multi-color patterns.

Linoleum Sheet or Tile Flooring shall be 2.5 mm (0.10 inch) gage; minimum 250 psi static load limit, ASTM F970; and with multi-color pattern and color extending throughout thickness, ASTM F2034, Type I. Resilient homogeneous vinyl sheet flooring shall be commercial quality, 2.0 mm (0.080 inch) overall gage, with minimum 1.6 mm (.066 inch) thick wear layer, protective urethane finish, ASTM F1303, Type II, Grade 1, Class A. Resilient vinyl composition tile shall be commercial grade, 3 mm (.125 inch) gage, FS SS-T-312B (1), Type IV, Comp. 1, Class 2, through pattern.

3. **Carpet:** Carpet manufacturer and installer shall be experienced, established and in good standing with the industry. Carpet, broadloom or tile, shall be installed per the Carpet & Rug Institute's recommendations. Carpet shall be tufted, textured loop, cut/loop or tip sheared, a minimum of 26 oz. face weight, minimum density of 6600, 100% premium branded yarn- or solution-dyed, Type 6 or 6.6 continuous hollow filament nylon. Carpet shall be multi-color and patterned for soil and wear hiding properties. Carpet shall have high performance backing warranted against zippering, edge raveling and delamination, be anti-static and anti-microbial. Carpet shall meet Flammability ratings; generate less than a 450 rating, ASTM E662; meet the Critical Radiant Flux Classification of not less than 0.45 W/sq. cm., ASTM E648. Where indicated in the room requirements, provide attached polyurethane cushion or separate polyurethane cushion for double stick pad installations, ASTM 1667 and ASTM 3676.

4. **Wall Base:** Provide porcelain or ceramic tile base for porcelain or ceramic tile floor. Provide solid, through color preformed rubber or vinyl base for carpeted/resilient flooring areas. Provide a sealant between base and floor finish in all wet areas.

C3030 CEILING FINISHES

Unless otherwise noted in the room requirements, acoustical ceiling panels shall be 24 inch by 24 inch, with a minimum light reflectance of .75, Class A, flame spread 25 or less and smoke development of 50 or less, ASTM E84. Acoustical ceiling panels shall have minimum 60% recycled content and conform to ASTM E1264. Panels shall have a factory-applied standard washable painted finish or Type IV with factory-applied plastic membrane-faced vinyl, Form: 1, 2 or 3. Provide square edge except as noted.

Unless otherwise noted in the room requirements for entrance lobby, restrooms and showers, provide a painted, suspended gypsum board ceiling. Exposed structural systems shall be painted.

C3040 PAINTING

All painting and coating materials shall be low VOC, comply with local air quality control laws and, regulations; and conform to the Master's Painters Institute's (MPI) *Architectural, Interior Systems Manual* and the MPI's *Maintenance and Repainting Manual* recommendations for paint systems, surface preparation and applications.

Provide minimum of one prime coat and two finish coats. The prime coat shall not be combined with texture or other coatings. Seal and prime all surfaces to cover underlying stains or discoloration that may affect finish paint. Finish coats shall provide full coverage of undercoats and substrates. All walls and ceilings in wet area shall have semi-gloss paint. All wood or metal cased openings, door trims and casings, window trims and casing, and other finish trim shall have semi-gloss paint. All interior walls and ceilings shall have satin or eggshell finish. For previously painted surfaces, prime all surfaces to ensure compatibility of finish coats. Do not paint prefinished surfaces except as noted.

Provide Institutional Low Odor/Low VOC Latex paint or High Performance Architectural Latex systems as defined and approved by the MPI Systems Manual for the various substrates required to be painted.

Paint/Color Selection: Provide paint systems tested to "Detailed Performance Level" standard as defined by MPI. Paints shall be readily available for purchase in standard colors.

SECTION D. SERVICES

D10 CONVEYING Elevators and Escalators - Not used

D20 PLUMBING

Provide plumbing fixtures, appliances, and equipment complete and usable as required by Part 3. All plumbing fixtures, appliances and equipment, piping, valves, accessories, and appurtenances shall comply with International Plumbing Code (IPC) and all other applicable codes and standards, including energy, water conservation, and local activity regulations and standards. Provide all plumbing fixtures to meet

current criteria of EPA Watersense program <http://www.epa.gov/watersense>

1. **Domestic Water:** Provide ASTM B 88 Type K or L copper tubing and fittings for pipe sizes 4 inches or smaller. Provide Type L tubing above ground with solder fittings. For buried piping, use Type K tubing with solder fittings, or Chlorinated polyvinyl chloride (CPVC) Plastic pipe, fittings, and solvent cement per ASTM D 2846/D 2846M for sizes 4 inches and smaller.

Provide mineral fiber insulation with vapor barrier on domestic water (hot and cold) supply and recirculation piping. Provide re-circulating pumps or instantaneous water heaters for hot water systems with fixtures greater than 100 ft from hot water source. Provide water hammer arrestors per PDI STD WH-210 as required for rapid water shut off scenarios. All water valves except for fixture shut off valves shall be ANSI B16.18 brass, full port ball type. All plumbing fixtures shall have separate shut off valves. All piping shall be concealed in walls, attic spaces, or in crawl spaces under floors. Provide access panels for valves behind walls. No under slab water piping is allowed. Fittings for annealed copper tubing shall conform to ANSI B16.22. Solder and flux shall be lead free. Exposed exterior piping is prohibited unless otherwise not practical. Provide identification for piping and equipment.

2. **Wall Penetrations:** Piping which penetrates fire rated walls shall be completely sealed to maintain fire resistance integrity as required by Code. Penetrations through walls that are not fire rated shall be adequately supported and sealed. Pipe penetrations through exterior walls shall be sleeved, caulked with weatherproof sealant and provided with finish trim.

D2010 PLUMBING FIXTURES

Fixtures shall be provided complete with fittings, and chromium-plated, or nickel-plated brass (polished bright or satin surface) trim. All fixtures, fittings, and trim, shall be from the same manufacturer and shall have the same finish. Access panels shall be provided for all bathtubs and showers, except at exterior and party walls and where tub or showers are back to back. Provide cleanouts in accordance with the plumbing code. Rotate or extend cleanouts required to facilitate maintenance and clearing of blockage in waste piping.

1. **Faucets:** All faucets shall be brass construction, washerless type, with seals and seats combined in one replaceable ceramic disk valve cartridge designed to be interchangeable with all lavatories, bathtubs and kitchen sinks, or having replaceable seals and seats removable either as a seat insert or as a part of a replaceable valve unit. Faucets provided shall be of the same type and manufacturer throughout the facility, unless otherwise noted. Lavatory faucets shall be U.S. Environmental Protection Agency (EPA) Watersense® certified and labeled bathroom sink faucets.
2. **Water Closets:** Water closets shall be in accordance with ANSI A112.19.2, with trim conforming to A112.19.5. Water closets shall be vitreous china and have an elongated bowl with trip lever, unlined tank, close coupled siphon jet, floor outlet with wax gasket, flange and an anti-siphon float valve. Provide white closed front seat and cover for private toilets and open front seat cover for public facilities. Water consumption shall be no greater than 1.6 gallon maximum per complete flushing cycle. Provide self-closing metering type flush valve on flush valve type water closets, unless electronic control is specified in Part 3. Maximum flush volume shall not exceed 1.28 gallon per flush (GPF) (4.8 Liter per flush (LPF)) for single function flush valves. Dual function flush valves shall provide a flush of 0.8 to 1.6 GPF (3.0 to 6.0 LPF) or 1.28 GPF (4.8 LPF) average for 2 low volume flushes and one high volume flush. Tank type water closets

shall be U.S. Environmental Protection Agency (EPA) Watersense® certified and labeled toilets.

3. **Urinals:** Provide U.S. Environmental Protection Agency (EPA) Watersense® certified and labeled ceramic-type urinals.

Non Water Use Urinals: ASME A112.19.2, white vitreous china, wall-mounted, wall outlet, non-water using, integral drain line connection, with sealed replaceable cartridge or integral liquid seal trap insert. The urinal and trap assembly shall maintain a sufficient barrier of a biodegradable immiscible liquid to provide the trap seal and inhibit the backflow of sewer gases. For urinals that use a replaceable cartridge, provide four additional cartridges for each urinal installed. Provide an additional quart of biodegradable liquid for each urinal installed. Provide ASME A112.6.1M concealed chair carriers. Installation and testing shall be in accordance with the manufacturers' recommendations. Drain lines that connect to the urinal outlet shall not be made of copper tube or pipe. Urinal design and installation shall be ADA compliant. Slope the sanitary sewer branch line for non-water use urinals a minimum of 1/4-inch per foot. Manufacturer shall provide an operating manual and on-site training for the proper care and maintenance of the urinal.
4. **Lavatories:** Unless otherwise specified by Part 3, lavatories shall be integral to the vanity countertops. Each lavatory shall be provided with hot and cold water tempered by means of a mixing valve or combination faucet.
5. **Sinks:** ASME/ANSI A112.19.3M sink, 20 gage stainless steel with integral mounting rim, minimum dimensions of 840 mm (33 inches) wide for two compartment or 560 mm (21 inches) wide for one compartment by 560 mm (21 inches) front to rear, with ledge back and undersides coated with sound dampening material.
6. **Water Coolers:** ARI 1010, wall-mounted, bubbler style, air-cooled condensing unit, 4.20 mL per second (4.0 gph) minimum capacity, stainless steel splash receptor, double wall heat exchanger, and all stainless steel cabinet. Install in accordance with the manufacturers instructions.
7. **Showers:** Provide U.S. Environmental Protection Agency (EPA) Watersense® certified and labeled showerheads connected to concealed pipe connected to copper alloy single control type mixing valve with front access integral screwdriver stops. Anchor the mixing valves and the pipe to each showerhead in wall to prevent movement. Unless otherwise specified by Part 3, showers shall be supplied with water at a temperature no more than 110°F by means of a pressure balance, tempering or mixing valve.
8. **Service sinks:** ASME A112.19.1M, white enameled cast-iron or ASME A112.19.2M white vitreous china, wall mounted and floor supported by wall outlet cast-iron P-trap, minimum dimensions of 560 mm (22 inches) wide by 457 mm (18 inches) front to rear with 230 mm (9 inch) splashback, and stainless steel rim guard. Provide ASME A112.18.1M copper alloy back-mounted combination faucets with vacuum breaker and 20 mm (0.75 inch) external hose threads
9. **Mop Sinks:** Pre-cast terrazzo or ASME A112.19.2M white vitreous china floor-mounted mop sink, 914 mm x 914 mm x 305 mm (36 inches x 36 inches x 12 inches). Terrazzo shall be made of marble chips cast in white Portland cement to a compressive strength of not less than 25 mPa (3625 PSI) 7 days after casting. Provide brass body drains with nickel bronze strainers cast

PART 4 – MINIMUM MATERIALS, ENGINEERING, AND CONSTRUCTION REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222

WORK ORDER NO. 1327210

NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

APRIL 17, 2015

integral with mop sink. Provide stainless steel rim guard for mop sink. Provide chrome-plated exposed hot and cold water faucets ASME A112.15.M wall-mounted copper alloy faucets swing spout with 20 mm (3/4 inch) hose connection, vacuum breaker, and pail hook. Provide mop hanger on wall above sink suitable for four mops.

10. **Laundry Sinks:** ANSI Z124.1, plastic, two compartment, minimum dimensions of 1016 mm wide by 533 mm (40 inches wide by 21 inches) front to rear, with floor-supported steel mounting frame secured to wall. Provide ASME A112.18.1M copper alloy centerset faucets, swing spout with aerator, and stainless steel drain outlets with cup strainers, and 40 mm (1.5 inch) adjustable P-trap with drain piping to vertical vent stack.
11. **Emergency Eyewash:** ANSI Z358.1, wall-mounted self-cleaning, non-clogging eye and face wash with quick opening, full-flow valves, stainless steel eye and face wash receptor. Provide copper alloy control valves. Pressure-compensated tempering valve is required for emergency fixtures, with leaving water temperature setpoint adjustable throughout the range 15.5 and 35 degrees C (60 to 95 degrees F) unless cold water supply meets temperature criteria.

D2020 DOMESTIC WATER DISTRIBUTION

1. **Natural Gas or Propane Fired Storage Water Heaters:** Provide high efficiency storage type natural gas or propane fired water heaters per ANSI Z21.10.1 or ANSI Z21.10.3 meeting AGA requirements. Unit efficiency shall meet or exceed that listed in the Title-24 Standards. Water heaters shall be equipped with glass-lined steel tanks, minimum R-15 polyurethane foam insulation, replaceable anodes, and adjustable range thermostat to allow hot water settings between 43 and 71 degrees C (110 and 160 degrees F). Water heater warranty shall be a minimum of 10 years. Provide vent in accordance with NFPA 54. Provide low NOx burners that meet SCAQMD requirements. Install in accordance with manufacturer's instructions and the code. Where earthquake loads are applicable, water heater supports shall be designed and installed for seismic forces in accordance with the International Building Code.
2. **Electric Water Heaters:** Provide electric water heaters with double heating element per UL 174. Unit efficiency shall meet or exceed that listed for FEMP or ENERGYSTAR, or as listed in ASHRAE 90.1, whichever is greatest. Water heaters shall be equipped with glass-lined steel tanks, high efficiency type, insulated with polyurethane foam insulation, replaceable anodes, and adjustable range thermostat to allow hot water settings between 43 and 71 degrees C.
3. **Domestic Water Boilers:** Boilers shall be designed, tested, and installed per ASME CSD-1 (Controls and Safety Devices) and ASME BPVC (Boiler and Pressure Vessel Code). The boiler shall meet the requirements of the UL 795, NFPA 85, ANSI Z83.3, and ASME CSD. Boilers must be certified by Naval Personnel or a contractor approved by the Contracting Officer.

D2030 SANITARY WASTE & VENT

All new sewers below concrete slab shall be solid core, minimum schedule 40 (DWV Type), ABS in accordance with ASTM 2661. New waste and vent piping above floor shall be Schedule 40 PVC (DWV Type) ASTM 2665 or ABS ASTM 2661. Use of ABS plastic pipe shall conform to the IBC and IPC.

Provide pipe sizing, configurations, and cleanouts as required by the IPC. Cellular core plastic pipe is not allowed. SOVENT systems are not allowed.

D2040 RAINWATER DRAINAGE

Below concrete slab shall be solid core, minimum schedule 40 (DWV Type), ABS in accordance with ASTM 2661. Above floor shall be cast iron hubless, or hub and spigot, or Schedule 40 PVC (DWV Type) ASTM 2665 or ABS ASTM 2661 as indicated in Part 3. Pipe materials shall conform to the IBC and IPC. Provide pipe sizing, configurations, and cleanouts as required by applicable codes and standards.

D2090 OTHER PLUMBING SYSTEMS

Natural Gas Piping Systems: Exterior above grade natural gas piping shall be schedule 40 galvanized steel pipe with threaded fittings and joints. Underground exterior gas piping shall be polyethylene pipe that satisfies the requirements of NFPA 54, ASTM D2513-01, and ASME B31-8. Provide warning tape at 12 inches below grade directly above buried gas pipes. Below grade metal gas piping is prohibited. Interior gas piping shall be ASTM A 53, schedule 40 black steel with ASME B16.3 threaded fittings and joints. The use of semi-rigid tubing and flexible connectors for gas equipment and appliances is prohibited except for final connections to the equipment and appliances where they shall be provided. Provide flexible gas connections in accordance with ANSI Z21.45 and not more than 40 inches long. Provide accessible gas service with shutoff valve for all equipment. Gas piping shall conform to NFPA 54 and shall be pressure tested in accordance therewith. Gas piping is considered a fragile utility in the content of UFC 4-010-01, *DOD Minimum Antiterrorism Standards for Buildings*.

D30 HEATING, VENTILATION AND AIR CONDITIONING (HVAC) SYSTEMS

The HVAC systems shall comply with the latest edition of the International Mechanical Code, International Plumbing Code, ASHRAE Standards, National Electrical Code, National Fire Protection Association Publications, International Building Code, and California Title 24 or ASHRAE 90.1 energy efficiency standards (the more stringent of the two) unless otherwise specified in Part 3. All equipment, appliances, ductwork and accessories shall comply with applicable codes and standards. For projects located in California, also comply with California Energy Commission (CEC) efficiency rating requirements as stated in Ca. AB 970 Title 24. The Contractor shall certify that the installation is in conformance with the applicable codes and standards at the completion of the contract, prior to final invoice being processed and final acceptance. Provide Energy Star rated equipment where available. Provide equipment with performance in excess of Energy Star requirements where specified.

1. **Equipment Clearance:** Provide working space around all equipment. Provide all required fittings, connections and accessories required for a complete and usable system. All equipment shall be installed per the manufacturer's recommendations. Where the word "should" is used in manufacturer's instructions, substitute the word "shall".
2. **Material and Equipment Qualifications:** All materials and equipment shall have been in satisfactory commercial or industrial use for 2 years prior to the bid opening. The 2-year use shall include applications of equipment and materials under similar circumstances and of similar size. The product shall have been for sale on the commercial market through advertisements, manufacturer's catalogs, or brochures during the 2-year period.
3. **Motors:** Single-phase fractional-horsepower alternating-current motors shall be high efficiency

PART 4 – MINIMUM MATERIALS, ENGINEERING, AND CONSTRUCTION REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222

WORK ORDER NO. 1327210

NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

APRIL 17, 2015

types corresponding to the applications listed in NEMA MG 11. Select polyphase motors based on high efficiency characteristics relative to the applications as listed in NEMA MG 10. Additionally, all polyphase squirrel-cage medium induction motors with continuous ratings shall meet or exceed energy efficient ratings per Table 12-10 of NEMA MG 1. Provide controllers for 3-phase motors rated 0.75 kW (1 hp) and above with phase voltage monitors designed to protect motors from phase loss and over/under-voltage. Provide means to prevent automatic restart by a time adjustable restart relay. For packaged equipment, the manufacturer shall provide controllers including the required monitors and timed restart. Provide reduced voltage starters for all motors 25 hp and larger.

4. **Equipment Support:** Provide housekeeping pads and vibration isolators under all floor-mounted equipment.
5. **Coatings:** When required in Part 3, provide chiller and air handler coils with copper tube/copper fin coil construction or immersion applied, baked phenolic or other approved coating. Field applied coatings are not acceptable. Mechanical equipment casings shall have painted finishes that pass a salt-spray test conducted per ASTM B117 for duration of at least 500 hours.
6. **Equipment Insulation:** Provide insulation on all chilled water equipment. Insulate hot and chilled water pumps and equipment as suitable for the temperature and service in rigid block, semi-rigid board, or flexible unicellular insulation to fit as closely as possible to equipment. Provide vapor retarder for chilled water applications.
7. **Acoustical considerations:** Noise levels in all areas served (supply, return, and exhaust) by a mechanical system shall comply with ASHRAE Design Guidelines for HVAC related background sound in rooms as indicated in the lasted ASHRAE Fundamentals Handbook. The RC-rating method shall be utilized.

D3020 HEAT GENERATING SYSTEMS

1. **Boilers:** Boilers shall be designed, tested, and installed per ASME CSD-1 (Controls and Safety Devices) and ASME BPVC (Boiler and Pressure Vessel Code). The boiler shall meet the requirements of the UL 795, NFPA 85, ANSI Z83.3, and ASME CSD. Do not provide watertube boiler(s) for hydronic heating when size permits otherwise. Provide insulated boiler stack in accordance with manufacturer's recommendations and conform to NFPA 211 or provide pre-manufactured, multi-wall stacks complying with NFPA 54 or NFPA 58 and UL-listed. Low pressure boilers shall be equipped with one or more pressure relieving devices, adjusted and sealed to discharge at a pressure not to exceed the maximum allowable working pressure of the boiler. The combined capacity of these devices shall be such that with the fuel burning equipment installed and operating at maximum capacity, the pressure cannot rise more than 5 psi for steam boilers or 10% for water boilers above the maximum allowable working pressure of the boiler. Pressure relieving devices shall be installed as required by the referenced code, be ASME stamped and rated, and shall be installed with the valve spindle in the vertical position. Provide with manual lifting device for periodic testing. Boilers shall comply with the local air quality regulations. Boilers shall be equipped with pressure and temperature gauges as required for proper maintenance and operation. Thermometers shall also be provided at the inlet and exit of the boiler, and shall be visible to the operator from the operating area.

2. **Furnaces:** UL-listed, factory assembled, self contained, forced circulation, furnace. Provide electronic ignition system. Unit shall be design certified by AGA, GAMA efficiency rating certified, for gas furnaces and NFPA 31 for oil furnaces. Provide with cooling coil as necessary. Furnaces shall comply with the local air quality regulations.

D3030 COOLING GENERATING SYSTEMS

1. **Chillers:** Air-cooled chillers shall be type indicated in Part 3 and meet the requirements of ARI 550/590-98. Provide control panel with the manufacturers' standard controls and protection circuits. If DDC system is required in project, provide a control interface for remote monitoring of the chiller's operating parameters, functions and alarms from the DDC control system central workstation. Provide complete start-up and operational testing of chiller equipment.
2. **Direct expansion systems:** Provide units factory assembled, designed, tested, with ducted air distribution and rated in accordance with ARI 210/240 or ARI 340/360. Refrigerant piping size shall be per the manufacturer's recommendations. Insulate refrigerant piping suction lines and condensate drain.
3. **Refrigerants:** The use of Ozone Depleting Substances (ODS) as well as the qualifications and credentials of personnel servicing equipment that contains ODS is restricted. Refrigerants shall have an Ozone Depletion Factor (ODF) of 0.055 or less. The ODF shall be in accordance with the "Montreal Protocol on Substances That Deplete the Ozone Layer", September 1987, sponsored by the United Nations Environment Program.
4. **Coils:** If coatings are indicated in Part 3, provide with copper tube/copper fin construction or immersion applied, baked phenolic or other approved coating that passes the 3000 hour salt spray resistance test using ASTM B117 procedure. Field applied coatings are not acceptable.
5. **Variable Refrigerant Flow (VRF) systems:** The system shall consist of VRF heat pump units, branch circuit controllers, VRF fan coil units, and associated controls. The system shall be designed to provide the facility with simultaneous heating and cooling utilizing hot gas refrigerant or sub-cooled liquid. Provide system with heat recovery. The heat pump units shall be inverter driven and shall utilize R410A refrigerant. Total capacity of the branch controllers shall be between 50% and 150% of the rated capacity. All refrigerant piping shall be sized and installed in strict compliance with the manufacturer's requirements. Refrigerant piping shall be clean, dry, and leak free. Prior to installation all refrigerant pipes shall remain sealed. During installation and prior to filling, nitrogen shall be used to maintain cleanliness and prevent oxidation and scaling while brazing.

D3040 DISTRIBUTION SYSTEMS

1. **Ductwork:** All ductwork shall be provided in accordance with the latest SMACNA guidelines. Flexible duct lengths shall not exceed 6 feet. Provide galvanized sheet metal ducts except for special exhaust systems and the following:

- a. For fume hood exhaust, kitchen hood exhaust, and dishwasher exhaust, provide stainless steel ductwork.
 - b. For shower area exhausts, provide aluminum or stainless steel ductwork and sloped to drain provisions. After the shower exhaust is mixed with a volume of general exhaust air equal to 200% of the shower exhaust rate, standard galvanized construction may be used.
 - c. Internal insulation-lined ductwork is prohibited in all areas. For ductwork located exterior to the building, provide externally insulated systems with sheet metal cladding. Provide external thermal insulation for all ductwork. Insulate ductwork in concealed spaces with blanket flexible mineral fiber. Insulate ductwork in Mechanical Rooms and exposed locations with rigid mineral fiber insulation. Provide insulation with factory applied all-purpose jacket with integral vapor retarder. In exposed locations, provide a jacket with white surface suitable for painting. Flame spread/smoke developed rating for all insulation shall not exceed 25/50. Minimum insulation thickness shall be the minimum thickness required by ASHRAE 90.1. Insulate the backs of all supply air diffusers with blanket flexible mineral fiber insulation.
 - d. The ductwork shall be sealed with an approved duct sealer and in accordance with SMACNA standards. If leakage testing is indicated in part 3, the duct leakage shall not exceed 2%.
 - e. Provide manual volume dampers in each branch take-off from the main duct to control air quantity. Dampers shall conform to SMACNA DCS. Dampers shall be installed in accessible locations.
2. **Fire Dampers:** Fire dampers shall be rated per UL 555. Fire dampers shall be dynamic type rated for closure against a moving airstream. Provide fire dampers that do not intrude into the air stream when in the open position.
3. **Piping:**
- a. Provide insulated, steel piping for sizes 4 inches and larger and insulated copper piping for sizes less than 4 inches for water supply and return piping to serve the HVAC equipment throughout the facility.
 - b. Provide system flushing and start-up for water systems.
 - c. Oil piping: ANSI/ASTM A53 or A106 piping with associated ASME fittings or ASTM B88, type L or M copper tubing with ASME B16.26 flared fittings or compression type fittings.
4. **Exhaust Fans And Ducts:**
- a. **General:** Exhaust fans shall be sized to move the volume of air required to comply with International Mechanical Code for the areas requiring exhaust.
 - b. **Bathroom, restrooms and Utility Room Exhaust Fans:** Exhaust fans shall be sized to give not less than 10 air changes per hour in the space to be ventilated. Fans shall have a maximum sound level of 3 sones and be separately switched from light.
 - c. **Flues:** When required, provide new Type B, U.L. listed, double wall flues. Flue installation shall be in accordance with the International Mechanical Code.
5. **Air handling units:** Modular construction, double wall air handling units with minimum of 25 mm (1 inch) casing insulation. Provide ARI 430 certified fans and ARI certified coils. Provide stainless steel, positive draining condensate drain pan. For 100% outside air units provide capability for cooling, heating, dehumidification and reheat.

D3050 TERMINAL AND PACKAGE UNITS

PART 4 – MINIMUM MATERIALS, ENGINEERING, AND CONSTRUCTION REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222

WORK ORDER NO. 1327210

NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

APRIL 17, 2015

1. **Unit ventilators:** Unit shall be factory assembled unit ventilator capable of up to 100% outdoor air ventilation and UL-listed.
2. **Unit heaters:** ANSI Z83.8 and AGA label. Equip each heater with individually adjustable package discharge louver. Provide with thermostat.
3. **Fan coil units:** UL-Listed, factory assembled and tested fan coils, ARI 440 and ARI certified.
4. **Packaged units:**

Factory packaged rooftop units in accordance with ARI 430 and suitable for outdoor installation. Provide with manufacturer's roof curb.

Packaged through wall units shall be factory assembled air conditioner or heat pump and rated in accordance with ARI 310 or ARI 380 and ARI certified. Unit shall include heat and operate under the standard unit controls. Units shall be designed to allow ease of maintenance by use of a wall sleeve. Units shall have internal condensate removal (condensate shall not be externally drained).

D3060 CONTROLS AND INSTRUMENTATION

1. **General:** Provide stand-alone or distributed direct digital controls, as required in Part 3.
2. **Distributed Direct Digital Controls (DDC):** DDC hardware shall be UL-916 rated. Use controllers in a distributed control manner. Controllers shall be stand alone with an internal clock and modem. The total number of I/O hardware points shall not exceed 48 in any controller. Provide sufficient memory for each controller to support required control, communication, trends, alarms, and messages. Provide communications ports for controller to controller, on-site interface, remote workstation interface, and telecommunications interface. When providing a partial DDC system or connecting to an existing DDC system, provide a laptop computer with all necessary software for user interface.

D3070 SYSTEMS TESTING AND BALANCING

All HVAC water and air systems, both new and retrofit, shall be TABed in accordance with NEBB or AABC standards. As part of any TAB air balancing effort, acceptable air quantity variations shall be 0 to -10% for exhaust systems and 0 to +10% for supply air systems.

D40 FIRE PROTECTION

Provide new or extend existing Automatic Fire Sprinkler systems, Smoke and Heat detection systems, Fire Alarm and Mass Notification systems as required. The work for fire sprinklers, fire alarm, smoke detection, and heat detection shall be provided by contractors licensed to perform such work.

Project Requirements: Prior to the start of design, the Designer of Record shall meet with the

Government's Fire Protection Engineer to determine the extent and types of fire protection required.

D4010 FIRE ALARM AND DETECTION

Fire alarm system shall include manual stations, system smoke detectors, duct smoke detectors, heat detectors, audio/visual alarms, connection to basewide fire alarm monitoring, electrical supervision of fire pump controllers, and electrical supervision of all sprinkler system alarm and supervisory devices as required.

D4020 FIRE SUPPRESSION WATER SUPPLY AND EQUIPMENT

The water supply information is provided for bidding purposes. The design point of connection to existing water supply shall require the approval of the Contracting Officer. The FPE DOR shall conduct additional flow tests after contract award prior to any design submissions. Tests shall be coordinated through the Contracting Officer.

D4040 SPRINKLERS

Areas subject to freezing shall be provided with a dry pipe system.

D50 ELECTRICAL

D5010 ELECTRICAL SERVICE & DISTRIBUTION

Provide interior electrical wiring, fixtures, switches, outlets, and apparatus in accordance with applicable codes and standards. The electrical system shall conform to NFPA 70. Power and lighting circuits shall be separate.

1. **Wiring:** All wiring shall be in electrical metal conduits and shall be concealed except in the industrial spaces and at locations indicated in Part 3. No conductors shall be smaller than No. 12 AWG, copper wires. Wiring below slab or underground shall be in Schedule 40 PVC with ground wire. Exposed conduits on the exterior of the building are prohibited. Provide a ground conductor for each circuit; conduits shall not be used for grounding. Use of cable assemblies Types AC, MC, or MI and flat conductors are prohibited. Circuit breakers shall be bolt-on type. Series rated circuit breakers and fusible panelboards shall not be used.
2. **Outlet Circuits:** Lighting and convenience outlets shall be on separate circuits. Install GFI protected receptacles at all wet or damp areas. Location of outlets shall be as required by applicable codes and standards. Provide extra outlets for maintenance and service staffs in spaces such as corridors, hallways and other public spaces as identified below. All exterior outlets shall be on separate circuits, shall be GFI protected, and equipped with a cover to prevent accidental water infiltration into the devices.
In addition to the location requirements specified by NFPA 70, locate general purpose and dedicated outlets in accordance with the following:
 - a. **Mechanical equipment:** Provide receptacle within 7.6 m (25 ft) of mechanical equipment on the interior and exterior of buildings.
 - b. **Office, staff support spaces, and other workstation locations:** One receptacle for each workstation with a minimum of one for every 3050 mm (10 ft) of wall space. When less than 3500 mm (10 ft) of wall at the floor line, provide a minimum of two receptacles spaced appropriately to anticipate furniture relocations. Limit loads to a maximum of

- four workstations per 20 amp circuit. See Appendix C, Table C1 for workstation load data.
- c. Conference rooms and training rooms: One for every 3.6 m (12 ft) of wall space at the floor line. Ensure one receptacle is located next to each voice/data outlet. Provide one receptacle above the ceiling to support video projection device. Extend circuit to wall location for connection to motorized screen. When it is expected that a conference room table will be specifically dedicated to floor space in a conference room, locate a floor-mounted receptacle under the table. This receptacle may be part of combination power/communications outlet.
 - d. Provide power outlets throughout the building to serve all proposed equipment, including government furnished equipment, and allow for future reconfiguration of equipment layout. Provide power connections to all ancillary office equipment such as printers, faxes, plotters, and shredders. Provide dedicated circuits where warranted.
 - e. In each telecommunications room provide a dedicated 20 amp circuit with a receptacle adjacent to each rack or backboard for each of the following:
 - 1) CCTV for training systems
 - 2) CCSTV for security systems
 - 3) CATV
 - 4) Voice systems
 - 5) Data systems.
 - f. Provide dedicated receptacles as required throughout the facility for television monitors. These outlets will typically be located at the ceiling level for wall mounted television monitors.
 - g. Provide dedicated receptacles as required throughout the facility for tape players and disc players.
 - h. Corridors: One every 15 m (50 ft) with a minimum of one per corridor.
 - i. Janitor's closet and toilet rooms: One GFI receptacle per closet. Provide GFI receptacles at counter height for each counter in toilets such that there is a minimum of one outlet for each two sinks.
 - j. Space with counter tops: One for every 1.200 m (4 ft) of countertop, with a minimum of one outlet. Provide GFI protection of outlets when located within 1.8 m (6 ft) of plumbing fixtures.
 - k. Building exterior: One for each wall, GFI protected and weatherproof.
 - l. Kitchen non-residential: One for each 3.05 m (10 ft) of wall space at the floor line. Provide GFI protection when located within 1.8 m (6 ft) of plumbing fixture.
 - m. Child occupied spaces (including toilets): One for every 3.6 m (12 ft) of wall space. Use child safety type such as those that require rotating an integral surface cover plate to access current. Removable caps and plugs are not acceptable.
 - n. All other rooms: One for every 7.6 m (25 ft) of wall space at the floor line. When 7.6 m (25 ft) or less of wall at the floor line exists in a room, provide a minimum of two receptacles spaced appropriately to anticipate furniture relocations.
 - o. Special purpose receptacles: Designer of Record must coordinate with the user to provide any special purpose outlets required. Provide outlets to allow connection of equipment in special use rooms.
3. **Service Entrance Equipment:** When a switchboard or switchgear is required, the Designer of Record shall utilize UFGS Section 26 23 00, *Switchboards and Switchgear*, for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.

D5020 LIGHTING & BRANCH WIRING

1. Lighting Fixtures: All lighting fixtures shall be energy conservation compact fluorescent except where indicated by Part 3.
 - a. **Fluorescent Fixtures for Administrative and Commercial Spaces:** For offices, commercial and administrative spaces and facilities provide high efficiency ballast, and instant or rapid start recessed fluorescent fixtures.
 - b. **Three-Way and Four-Way Switches:** Provide three-way or four-way switching of light fixtures as necessary to facilitate movement between adjacent spaces to allow efficient energy management.
2. **Exterior Lighting Fixtures for Large Open Areas:** Exterior lighting fixtures for large open areas such as parking lots, streets and playgrounds shall be energy efficient High-Intensity Discharge (HID) or compact fluorescent fixtures and shall comply with local regulations regarding low lighting levels to avoid light pollution.
 - a. **Photocell Overriding Switch:** Provide photocell-overriding switch for all outdoor light fixtures.

D5030 COMMUNICATIONS & SECURITY

1. **Telecommunications Systems:** Provide a horizontal distribution system including, but not necessarily limited to, all wiring, pathway systems, connector blocks, protectors for all copper service entrance pairs, terminators for all fiber optic cables, outlet boxes, telephone jacks, and data jacks cover plates in accordance with EIA/TIA standards. Provide Category 6 UTP telephone premise wiring where telephones are required.
2. **Public Address Systems:** Provide a Public Address system with speakers in all locations identified in Part 3.
3. **Intercommunications Systems:** Provide an Intercommunication System to allow two-way communications between all locations identified in Part 3.
4. **Television Systems:** Provide television systems to the extent specified in Part 3. Coordinate with the local Cable Company, Local users and Local Authority at the Activity for other specific requirements. The interior cable outlets and wiring shall be complete and ready for use. Wiring shall not be run exposed on any surface of the building.
5. **Security Systems:** Provide an Intrusion Detection System (IDS) to sense all perimeter doors and windows and the interior volume in at least two locations. System shall have 90-minute battery back-up and annunciate both locally and at the Base Security Office via a telephone dialer. System shall have entry/exit timer. Provide wall mounted keypad control at two locations.

D5090 OTHER ELECTRICAL SERVICES

PART 4 – MINIMUM MATERIALS, ENGINEERING, AND CONSTRUCTION REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222

WORK ORDER NO. 1327210

NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

APRIL 17, 2015

1. **Surge Protective Device (SPD):** Provide SPD in accordance with UFC 3-501-01.
2. **Variable Frequency Drives:** When variable frequency drives are required, the Designer of Record shall utilize UFGS Section 26 29 23 20 for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.
3. **Emergency Generators:** When an emergency generator is required, the Designer of Record shall utilize UFGS Section 26 32 13.00 20 for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.
4. **Automatic Transfer and Bypass/Isolation Switches:** When an Automatic Transfer Switch is required, the Designer of Record shall utilize UFGS Section 26 36 23.00 20 for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.
5. **Uninterruptible Power Supply (UPS) System:** When a UPS system is required, the Designer of Record shall utilize UFGS Section 26 33 53.00 20 and shall submit the edited specification section as a part of the design submittal for the project.
6. **400 Hertz Systems:** The Designer of Record shall utilize UFGS Section 26 32 26 or 26 35 43 for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.
7. **Lightning Protection:** When lightning protection is required, the Designer of Record shall utilize UFGS Section 26 41 00.00 20 for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.
8. **Building Photovoltaic System**

Provide a grid tied photovoltaic system including roof mounted crystalline photovoltaic panels, combiner boxes, inverters, and support structure.

Provide all labor, materials, equipment and supervision required to implement the design and to provide a fully operational system.

Provide PV modules with a 20-year limited manufacturer warranty that generates no less than 80% of the rated output under Standard Test Conditions (STC).

Provide start-up and testing utilizing certified technician. Submit startup and testing report.

The PV system hardware and services shall meet or exceed all applicable local, State and utility requirements, conform to the applicable codes and standards, and have passed the listing and qualification tests, listed below. (Comply with the most recent version of each document).

- a. IEEE 1262 "Recommended Practice for Qualification of Photovoltaic Modules".

PART 4 – MINIMUM MATERIALS, ENGINEERING, AND CONSTRUCTION REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222

WORK ORDER NO. 1327210

NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

APRIL 17, 2015

- b. PowerMark certification for PV modules.
- c. IEEE Standard 928-1986, Recommended Criteria for Terrestrial Photovoltaic Power Systems (PV system performance criteria).
- d. IEEE 1547 Standard for Interconnecting Distributed Resources with Electric Power Systems
- e. Underwriters Laboratories 1741-2001 (UL Standard for Inverters and Charge Controllers).
- f. Underwriters Laboratories 1703 (UL Standard for Listing Photovoltaic Modules).
- g. Certification of PV Equipment: All PV modules, inverters, and electrical components shall be required to be listed or recognized by an appropriate and recognized United States Safety Laboratory (for example: UL or ETL).

Provide a comprehensive "Photovoltaic Application Analysis" with a detailed description of system, application, site shading conditions and expected kW output of the rooftop photovoltaic applications. The analysis shall utilize the Solmetric Suneye or the Solar Pathfinder shading analyzers to analyze the effects of the existing site shading conditions. Analysis shall include estimated PV output in kWh per year. Coordinate rooftop application analysis with other equipment that is required to be placed on the roof to determine space available and proper solar orientation for photovoltaic equipment.

The contractor work responsibilities include at a minimum: system design, equipment selection, and PV system installations. System shall be individually capable of providing peak power output of at least proposed PV system size, 208 or 480 volt, 3-phase, 4-wire power.

The final System configuration shall allow automatic operation without operator intervention. System design and equipment specifications shall minimize maintenance requirements. System shall include metering that must be incorporated with current AMI network (Advanced Metering Infrastructure) and planned energy metering projects.

The inverter(s) disconnects and associated electrical equipment must be located in an area that is accessible, weather-protected, and secure from vandalism and personal injury.

Disconnects and over current devices shall be mounted in approved boxes, enclosures, or panel boards. Disconnects and switches shall be DC rated when used in DC applications. Metal enclosures and boxes shall be bonded to the grounding conductor.

At a minimum, electrical meters shall capture the following data on individual system performance (minimum solar irradiance, DC power, AC real power, AC current, AC voltage, and power factor (recommend ION 8600 for AC); ambient air temperature, PV cell temperature, kW, and kWh). This data shall be captured at hourly intervals for a minimum one year. Units of temperature, power, and current shall be in Fahrenheit, Watts, and Amps respectively.

Transformers, if required, shall have a minimum efficiency based on factory test results of not less than the efficiency indicated in 10 CFR 431, Subpart K, paragraph 431.196(b). Transformers shall be housed in a NEMA 4X enclosures.

Mounting structures shall be corrosion resistant to marine environment.

Provide permanent plaque or directory at each building service and power source identifying all other building services and power sources.

Operators manuals for each system component shall include detailed instructions on how to operate the system, programming and installation instructions, emergency operating procedures, default program values and set points, listing of field programmed variables and set points, equipment wiring diagrams, product model number, with Name, Address and Telephone number of local representative, and starting, operating, and shut down procedures. Include normal and emergency shutdown procedures, schedule of maintenance work, if any, recommended cleaning agents and methods, replacement parts list, including internal fuses, and warranty information.

Provide a formal 2-hour on-site training session instructing operators in the operation and maintenance of the new system, including operation and maintenance of inverters, disconnects and other system components. Instruct personnel in removal and installation of panels, including wiring and all connections. At the time of training the Contractor shall furnish, for the equipment specified, operation and maintenance manuals, record drawings and recommended spare parts lists identifying components adequate for competitive supply procurement for operation and maintenance of system.

SECTION E. EQUIPMENT AND FURNISHINGS

E10 EQUIPMENT

Equipment and Appliances: Provide appliances and equipment to fulfill the work for Part 3. Whenever possible, all appliances and equipment provided for the facilities in the contract shall be by the same manufacturer and shall be the current model available at the time of proposals. Discontinued makes and models are prohibited. All appliances and equipment shall comply with applicable Energy Star efficiency rating requirements and shall be rated as high efficiency models. Appliances and equipment on California projects shall comply with California Title 24 and be rated as high efficiency. All appliances shall be of the same manufacturer and shall be the same, or similar in color. Submit catalog information for approval by the Contracting Officer prior to purchasing, delivery and installation of the appliances at the job site. Equipment and appliances such as dishwashers, ice machines with drains, garbage disposers, and ovens/ranges are not considered FF&E.

E20 FURNISHINGS

E2010 FIXED FURNISHINGS

Window Treatments: Unless otherwise specified in Part 3 window treatments shall be as follows: Horizontal blinds shall be aluminum, washable, cleanable, installed in all windows except for bathroom, kitchen, and utility windows. Horizontal blinds shall be installed at all sliding glass doors. All blinds shall be screwed or securely anchored to wood backing and shall be inside mounted except at sliding glass door. Submit catalog information for approval by the Contracting Officer. Blinds shall have 1-inch aluminum slats, mounted within window opening. Blinds shall have separate tilt and height controls, metal truck, head channels, wand, and valance. Solar shades shall be woven polyester/resin coated fiberglass or polyester fabric with fade resistance and dimensional stability; with clutch or motorized roller operation. Roller shades shall be screwed or securely anchored to wood backing and shall be inside mounted except at sliding glass door. Submit catalog information for approval by the Contracting Officer. Blinds shall have prefinished steel or aluminum roller housing and valance. Window treatments are not considered FF&E.

E2020 MOVABLE FURNISHINGS

1. Furnishings, Fixtures and Equipment (FF&E): FF&E shall include furniture, shop equipment, audiovisual equipment (excluding motorized screens), and specialty equipment. Weapon racks, drying cages, motorized projection screens and lockers are not considered FF&E. FF&E shall be fully integrated with the building system.

Design and provide FF&E for all areas as developed during client programming. Design an FF&E package and prepare supporting plans and procurement data in accordance with the General Interior Design Requirements UFC 3-120-10.

The contractor shall have an NCIDQ certified Interior designer not affiliated with any furniture dealership prepare both the SID and FF&E package and participate in design charrettes to develop the building floorplan. The designer must have previous experience in project types similar to this contract. As required, the contractor shall obtain services of equipment specialists to specify the audiovisual, shop, or specialty equipment. Equipment specialists shall not have any affiliation with the product specified.

The contractor's Interior Designer shall be responsible for specifying product and installation for all FF&E for the designated facilities built under this contract, using NAVSUP Blanket Purchase Agreements, GSA federal supply schedules or other government supply sources and complying with priorities found in FAR Part 8.404.

All fixed and movable furnishings selections shall be coordinated with Sections C10, "Interior Construction" and C30, "Interior Finishes." The FF&E shall be fully integrated with the building systems as well as the design and construction schedule.

As an option to the contract/task order, the contractor shall be authorized to procure all FF&E with separate funding.

- a. **FF&E Package:** Provide the FF&E loose furnishings package from Government supply sources schedules according to Federal Acquisition Regulations, to include but not limited to, systems and modular furniture, training and conference furniture, seating, tables, artwork, window covering, specialty furniture and equipment, and accessories. NAVSUP Blanket Purchase Agreements (BPA) must be used whenever possible.

The Government will provide separate funding for procurement of the FF&E package. Upon receipt of required funding, the Contractor shall be authorized by the Contracting Officer as an option to contract/task order to procure all FF&E using predominately negotiated price schedules from GSA or other Federal contracts. The amount of the modification will be the actual cost of these items from the Federal price schedules or NAVSUP BPAs, including any freight and installation charges from the furniture supplier as well as the contractor's FF&E Handling and Administration Rate (HAR). The HAR includes all of the prime contractor's effort related to storage, coordination, handling, administration of subcontractors, and all other associated costs and profit for the procurement of FF&E. The prime contractor will propose in the contract/task order solicitation the FF&E HAR. The contractor's proposed HAR may not exceed 5% of the total FF&E costs, as noted on the bid schedule. No other charges, expenses, fees, or other markups will be authorized.

When the FF&E package is complete and accepted by the Government, the procurement option will be awarded based on the specific line items in the final package. The Government's Interior Designer will approve the final FF&E submittal. The FF&E package will be presented to the Project Manager and they will expect the Contractor to

procure the FF&E exactly as specified and approved by the government Interior Designer.

Two copies of all ordering documentation shall be provided to the Contracting Officer including purchase orders and warranty information. The Contractor shall take maximum advantage of all exemptions from State and Local taxation authorities whether available to it directly or available to the contractor based on an exemption afforded the Government. The responsibility for paying applicable taxes rests with the contractor. Any state and local taxes applicable to the FF&E option will be included with the FF&E Dealer quote, if applicable.. Under regulation 1521, Construction Contractors performing work for the US Government are not required to charge the Government sales tax for the purchase of furniture. Any items purchased as building materials such as carpet are taxable. FF&E items are subject to the Buy American Act. The contractor shall not be required to secure any additional bond for the award of the FF&E option item. Any performance and payments bonds required for the FF&E option will be included in the prim contractor's FF&E HAR.

- b. **Procurement and Installation:** Upon completion and Government acceptance of the design, using the Best Value Determination (BVD) method in association with the Government's Interior Design Representative, the Government will award the FF&E procurement option for the Contractor to purchase the FF&E package. The Government's Interior Designer shall provide a certification to the Contracting Officer that the process was completed. The Design-Build Contractor will receive a letter of authorization from the Contracting Officer citing the name of the furniture dealer and other information to use when accessing the Government supply sources. The FF&E package includes the installation of all furniture and furnishings as specified in the FF&E package. The installation dealer specified in the FF&E package will receive, store, if required, transport to the project site, off load, inside deliver, unpack, assemble, place/install, clean, if required, and dispose of all the trash for all furniture and furnishings. The Contractor's Interior Designer will be responsible for specifying installation services and warehousing, as required, for all collateral equipment. It is the Contractor's responsibility to coordinate the building completion, occupancy, and furniture installation dates with the installation dealer specified in the FF&E package. Any costs associated with storing or delaying furniture shipments is the responsibility of the Construction Contractor. Davis Bacon wages do not apply to the FF&E installer accessed through Government supply sources. The Contractor should anticipate providing a deposit of between 30% and 50% of the furniture costs when placing their order.

All movable furnishings shall be installed in accordance with the manufacturer's instructions and warranty requirements. All movable furnishings shall be level and aligned and all doors, drawers and accessories shall be level and aligned to open, close and otherwise operate smoothly and securely. All systems furniture shall be installed by the systems furniture manufacturer's dealer of record and not by the General Contractor.

- c. **Furnishings for Special Functions:** Contractor shall coordinate shop equipment, audiovisual equipment, and specialty equipment, with the building systems.

SECTION F. SPECIAL CONSTRUCTION AND DEMOLITION

F10 SPECIAL CONSTRUCTION AND DEMOLITION

F1010 SPECIAL STRUCTURES

PART 4 – MINIMUM MATERIALS, ENGINEERING, AND CONSTRUCTION REQUIREMENTS

REPLACE FAN COIL UNITS, NRL B222

WORK ORDER NO. 1327210

NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

APRIL 17, 2015

1. Pre-Engineered Buildings

Provide the design and installation in accordance with the UFC 3-100-10, *Architecture* and UFC 3-300-10N, *Structural Engineering*.

- a. **Design Requirements** - The metal building manufacturer shall have AISC FCD, category MB certification. The Metal Building System design shall be in accordance with the Metal Building Manufacturers Association (MBMA) *Metal Building Systems Manual*. All structural design shall comply with the provisions of Section B10, "Superstructures", above.
- b. **Additional Roof Design Requirements - Roof Decking** - In addition to any other load requirements, roof decking shall be designed to support a 91 kg (200-pound) concentrated load at mid-span on a 300 mm (12-inch) wide section of deck.
- c. **Deflection** - the maximum deflection for -
 - 1) Structural Members - main framing members shall be L/240.
 - 2) Purlins and Roof Panels: The deflection due to live, snow, or wind shall not exceed L/180.
 - 3) For buildings with masonry infill, limit frame sway to L/600th of building eave height.
 - 4) Wall Panels - Maximum deflection of wall panels due to wind loads shall be L/120th of their respective spans except that when interior finishes are used the maximum allowable deflection shall be limited to L/180th of their respective spans.
- d. **Wall and Roof materials** -
 - 1) Alum/Zinc-Coated Steel Sheet: ASTM A792/ A792M, AZ 55.
 - 2) Aluminum Sheet: Alloy 3004 Alclad conforming to ASTM B209.
 - 3) Framing and Structural Members - Steel - ASTM A992 / A992M, ASTM A529/ A529M, ASTM A572/ A572M, or ASTM A588/ A588M.
 - 4) Framing and Structural Members, Aluminum: ASTM B221 or ASTM C308
- e. **Structural Tube:** ASTM A500 or ASTM B221.
- f. **Fasteners** - Shall be compatible with the materials they are fastening to, be gasketed when exposed to weather to prevent leaks, and shall provide both shear and tensile strengths not less than 3,336 N (750 pounds) per fastener. The main fastening system shall use concealed fasteners, however, when exposed fasteners are needed, color fasteners shall be color coated to match wall/roof panels.
- g. **Light Transmitting Roof Panels (Non-Insulated):** ASTM D3841, Type II, Grade 1.
- h. **Insulation:** Blanket-type fiberglass insulation with a factory applied facing on one side and having a permeance rating of 0.05 or less in accordance with ASTM E96. Flame Spread Rating 75 or less, and a Smoke Developed Rating of 150 or less when tested in accordance with ASTM E84.
- i. **Panel Finish** - Factory Color Finish - Provide factory applied baked coatings to the exterior and interior of metal wall panels and metal accessories. Provide exterior primer standard with panel manufacturer but not less than 0.8 mil dry film thickness (DFT). Provide PVDF exterior finish top coat of 70 percent inorganic pigments with 0.8 mil DFT. Provide factory-applied clear finish over the color topcoat and edge coating for projects within 91 meters of a water shoreline or industrial environments. Field apply 70 percent PVDF clear coat to unfinished panel edges or field cut panels. Interior finish

exposed to sun or rain shall be the same coating and DFT as the exterior coating. Interior finish protected from sun or rain exposure shall receive 1.0 mil DFT coating of siliconized polyester (SMP) resin coating with organic or blended pigments and manufacturer's standard primer.

F20 SELECTIVE BUILDING DEMOLITION

In general terms, demolition work shall include the removal and effective management and disposition of existing construction and or structures. Contractor shall take care to prevent damage to existing utilities and construction that are not scheduled for demolition. If damage occurs, the Contractor shall make repairs to the satisfaction of the Contracting Officer and at no cost to the Government. Comply with local Activity and Installation local requirements regarding demolition and removal. Unless otherwise specified in Part 3, all demolished materials and equipment must be removed from government property in accordance with applicable laws and regulations, including local Activity or Installation regulations. Selling of demolished or salvaged materials and equipment on government properties is prohibited.

Demolition Plan and Environmental Protection Plan: No demolition work shall take place until a Demolition Plan, Environmental Protection Plan, Safety Plan (including Activity Hazard Analysis), Asbestos Abatement Plan, and a Lead Abatement Plan have been submitted to, and approved by, the Contracting Officer. The Plans shall take into consideration, and indicate method of removal, disposition, and abatement of environmentally hazardous materials. Demolition, disposition, and abatement of hazardous materials must comply with all applicable Local, State, and Federal regulations and laws. If destructive investigation is to occur, the Contracting Officer shall approve a Destructive Investigation Plan.

When hazardous materials such as asbestos, lead paint, PCB and other hazardous materials are involved in the performance of the work, the contractor shall abate, remove and manage the hazardous materials in construction and finish materials such as insulation, flooring, wall materials, ceiling materials, roofing materials, heating, plumbing, ventilation, air conditioning equipment and installations in accordance with National as well as local Environmental Protection Laws and Regulations.

F2020 HAZARDOUS COMPONENT ABATEMENT

1. **Asbestos in DoD Schools:** For projects that require removal or disturbance of asbestos containing materials within DoD schools, perform work in accordance with the edited UFGS 02 82 14.00 10, *Asbestos Hazard Control Activities*.
2. **Asbestos Materials:** Asbestos shall be removed, transported and managed in accordance with the following regulations: 29 CFR 1926.1101, and 40 CFR 61-Subpart M.

Category I & II Nonfriable: Demolition of Category I & II nonfriable asbestos containing materials (approved to be left in place during building demolition) shall be performed in accordance with 40 CFR 61 - Subpart M.
3. **Lead Based Paint in Child Occupied Facilities:** For projects that require removal or disturbance of painted surfaces within a child occupied facility, perform work in accordance with the edited UFGS 02 83 19.00 10, *Lead Based Paint Hazard Abatement, Target Housing and Child Occupied Facilities*.
4. **Paint Containing Lead, Cadmium and Chromium:** Work which requires the disturbance of

paint that have been determined to contain all or any of the following: lead, cadmium and chromium must be performed in accordance with: 29 CFR 1926.62, 29 CFR 1926.1126 and 29 CFR 1926.1127.

5. **Mercury & LLR Components:** Work which requires removal of mercury and LLR components shall be performed in accordance with: 29 CFR 1910.1000, 10 CFR 20, and 40 CFR 273.
6. **PCBs:** Work which requires removal of PCB containing components or materials shall be performed in accordance with 29 CFR 1910.1000, 40 CFR 761, and 40 CFR 273.
7. **Hazardous Materials Reporting:**
 - a. **Daily Report:** Notify the Contracting Officer of work involving hazardous materials abatement and removal, including the quantities involved, on daily reports.
 - b. **Hazardous Material Inventory Report:** The Contractor shall provide a list of all hazardous materials used on the site.

SECTION G. BUILDING SITEWORK

G10 SITE PREPARATIONS

1. **General Requirements:** Building site work includes site preparation, site improvements, site civil/mechanical utilities, site electrical utilities, exterior furnishings, landscaping, and irrigation. Provide site work in accordance with UFC 3-201-01, *Civil Engineering*.
2. **Project Limitations:** Prior to the start of design, the contractor shall determine the exact limit-of-work line for the project periphery, considering items such as, but not limited to, utility work, landscape re-vegetation of disturbed areas, and lay down areas. The Civil Engineer and Landscape Architect of Record shall determine limit-of-work lines. Minimize the impact of construction activity on operations and neighboring facilities.
3. **Geotechnical Data:** A geotechnical engineer shall conduct the subsurface exploration, investigation/evaluation, testing, and analysis that the Designer of Record deems necessary for the design and construction of the proposed facilities, including building pad, structure, pavement sections, repairs, overlays, stormwater management facilities, utility structure foundations, septic systems, and other features requiring soil support.

G1010 SITE CLEARING

1. **Existing Utilities:** When the Contractor is to work at a site that has existing utilities, the contractor is responsible for coordination with Contracting Officer and utility companies for staking out, capping, connection and relocation of any existing utility systems or traffic interruption. Notify utility locator service for area where Project is located before site clearing.
2. **Interruption:** All interruption to the existing utilities and traffic shall be coordinated with and approved by the Contracting Officer not less than 14 calendar days in advance of such

interruption.

G1020 SITE DEMOLITION & RELOCATIONS

Abandon utility systems in-place conforming to applicable codes and regulations, removing their presence from the ground surface and clearly indicating that they have been abandoned. Remove utilities underneath or within 3.0 m (10 feet) of any new facilities. Fill abandoned gravity systems with flowable fill. Fill abandoned utility system piping under pavements subject to potential vehicle loading with flowable fill.

Remove existing utility structures to 900 mm (3 feet) below existing or new adjacent grade, whichever is greater. Break up bases to permit drainage. Fill with clean sand.

Comply with the requirements of the utility provider concerning utility relocation.

G1030 SITE EARTHWORK

The DOR shall utilize UFGS Section 31 23 00.00 20 for the project specification and shall submit the edited section as a part of the design submittal. Perform quality assurance for earthwork in accordance with UFGS Section 31 23 00.00 20. If sheeting/shoring or dewatering is required, the Contractor shall provide a registered Professional Engineer to provide excavation, sheeting, shoring, and dewatering plans and inspection of excavations and soil/groundwater conditions throughout construction. The Engineer shall be responsible for performing pre-construction and periodic site visits throughout construction to assess site conditions. The Engineer, with the concurrence of the contractor and the Contracting Officer, shall update the excavation, sheeting, shoring, and dewatering plans as construction progresses to reflect actual site conditions and shall submit the updated plan and a written report (with professional seal) at least monthly informing the Contractor and the Contracting Officer of the status of the plan and an accounting of Contractor adherence to the plan; specifically addressing any present or potential problems. The Engineer shall be available to meet with the Contracting Officer at any time throughout the contract duration.

G20 SITE IMPROVEMENTS

Provide site improvements as required to make a useable facility that meets functional and operational requirements, incorporates all applicable anti-terrorism, force protection and physical security requirements and blends into the existing environment.

Provide site improvements in conformance with applicable requirements of the Uniform Federal Accessibility Standards.

1. **Pavements:** For work in and adjacent to existing pavements, the Contractor is required to match the existing adjacent finish elevation, materials, paving section and texture, unless otherwise indicated in Part 3 or directed by the Contracting Officer.

Provide pavement design and pavement section materials in accordance with UFC 3-200-10N, *Civil Engineering*.

2. **Traffic Control:** If the site work involves interference with normal vehicular and or pedestrian traffic, the Contractor shall coordinate with the authority having jurisdiction, propose and obtain approval for traffic control measures that may be required in performance of the work required by

the contract.

3. **Performance Verification And Acceptance Testing:**
 - a. **Subgrade Preparation:** If required by the Designer of Record, perform proof rolling. Proof rolling shall be performed in the presence of the Contracting Officer. Rutting or pumping of material shall be undercut as directed by the Contracting Officer and replaced with satisfactory soil materials as defined by the Geotechnical Engineer.
 - b. **Base Course Performance Verification:** At a minimum, Contractor must perform visual performance verification. Surface shall be smooth with no ruts, sloped or crowned to not pond water.
 - c. **Bituminous Concrete Pavement Performance Verification:** At a minimum, Contractor must perform visual performance verification. Finished surface shall be uniform in texture and appearance, free of defects such as cracks and creases, and be sloped or crowned so as to not pond water.
 - d. **Portland Cement Concrete Pavement Performance Verification:** At a minimum, Contractor must perform visual performance verification. Finished surface shall be uniform in texture and appearance, free of defects such as cracks and spalls, and be sloped or crowned so as to not pond water.
 - e. **Concrete Joint Performance Verification:** Joint sealer that fails to cure properly, or fails to bond to joint walls, or reverts to uncured state or fails in cohesion, or shows excessive air voids, blisters, or has surface defects, swells, or other deficiencies, or is not recessed within indicated tolerances shall be rejected. Remove rejected sealer, re-clean and reseal joints.

G2040 EXTERIOR FURNISHINGS

All site furnishings shall be permanently attached to concrete pads. Site furnishings shall conform to the Base Exterior Architecture Plan (BEAP) or Installation Appearance Plan (IAP) for each Activity. If no product guidance is given, coordinate material, finish and color with architecture (fiberglass and aluminum are not acceptable) and provide to the greatest extent possible, materials with industrial recycled content, preferably from regionally local manufacturers. At a minimum, provide a trash and ash receptacle at each entry and gathering/smoking area.

G2050 LANDSCAPING

G30 SITE CIVIL/MECHANICAL UTILITIES

Develop the site to provide water, fire protection, sanitary sewer, storm drainage, heating, cooling and fuel distribution services that meet the requirements of each utility provider and each applicable regulatory agency that governs and issues permits for the construction and operation of these systems. Site design shall also comply with Department of Defense requirements concerning Low Impact Development (LID) per UFC 3-210-10, as well as state or local stormwater management regulations, and applicable project sustainability goals. Submit sealed calculations with narrative to the Government for civil and environmental review documenting all assumptions and which criteria governs the design.

Coordinate with the local utility providers and pay any fees or charges required to connect to their utility. Identify and obtain all permits to comply with all federal, state, and local regulatory requirements associated with this work. Coordinate all reports, submittals, and permit applications through the Contracting Officer. The Contractor shall perform work in accordance with the obtained permits.

Provide all required fittings, connections and accessories required for a complete and usable system. All equipment shall be installed per the criteria indicated in this RFP and the manufacturer's recommendations. Where the word "should" is used in the manufacturer's recommendations, substitute the word "must".

G3010 WATER SUPPLY

1. **Water System Design and Construction:** Provide the new water system and connections to the existing water system in accordance with UFC 3-230-01, *Water Supply: Storage, Distribution, and Transmission*; the utility provider's requirements; or the state waterworks' regulations; whichever is more stringent.
2. **Notifications:** Notify the utility provider of the additional demand generated by the proposed facility. Provide a copy of all correspondence with the utility provider to the Government's Civil/Mechanical Reviewer.
3. **Performance Verification And Acceptance Testing:** Provide testing on water mains and service lines in accordance with the state waterworks' regulations and the following:
 - a. Ductile iron and other materials: AWWA C600.
 - b. PVC: AWWA C605.
whichever is more stringent. Do not begin testing on any section of a pipeline where concrete thrust blocks have been provided until at least 5 days after placing of the concrete.

G3020 SANITARY SEWER

1. **Sanitary System Design and Construction:** Provide the new sanitary sewer system and connections to the existing sanitary sewer collection system in accordance with UFC 3-240-01, *Wastewater Collection*; the utility provider's requirements; or the state sewerage regulations; whichever is more stringent.
2. **Notifications:** Notify the utility provider of the additional wastewater flow generated by the proposed facility. Provide a copy of all correspondence with the utility provider to the Government Civil Reviewer.
3. **Wastewater Pump Station:** Where required, provide a duplex, grinder pump station in accordance with the utility provider's requirements. Provide pump station wet well of fiberglass construction. Provide adjacent valve vault of precast concrete construction.

Provide automatic control to start and stop the pump system. Provide automatic level control by floats in accordance with the preferences of the system owner to fill and prevent overflow of the wet well. Provide an emergency pump connection.

Provide a telephone dialer in the control panel capable of accepting up to 8 telephone numbers. At the control panel provide an alarm horn and light with battery backup. Alarms shall include high liquid wet well level; loss of main power; no flow as sensed by current sensor; and pump failure via overload or motor heat sensor trip. Provide seal failure indicator lights and elapsed

time meters.

Provide electrical connections for a portable emergency generator hook-up sized to start up and maintain the total rated running capacity of the station, including the pumps, controls, lighting, and other auxiliary equipment.

4. Performance Verification And Acceptance Testing:
 - a. Sanitary Sewer Distribution System Performance Verification: Provide testing on sewer mains and laterals in accordance with the state sewerage regulations. At a minimum, perform the following:
 - 1) Visual Test: Remove manhole covers and conduct a visual inspection as follows:
 - a) Inspect for visible leaks in lines or manholes.
 - b) Inspect condition of grout in the interior joints of the manholes.
 - c) Inspect manhole frames and covers for proper type and installation.
 - d) Inspect to see if lines are free of debris.
 - e) Inspect manhole benches and inverts.
 - f) Check alignment and grade of gravity lines by laser or by introducing sufficient water into the line to verify the absence of sags, as directed by the Contracting Officer.
 - g) Mirror test: Check each straight run of pipeline for gross deficiencies by holding a light in a manhole; it shall show a full circle of light through the pipeline when viewed from the adjoining end of line.
 - 2) Leakage Tests: Test lines for leakage by either infiltration tests or exfiltration tests, or by low-pressure air tests in accordance with the following:
 - a) Exfiltration Tests: ASTM C 969M (ASTM C 969) and perform calculations in accordance with its Appendix.
 - b) Low-pressure Air Tests: Pipelines: ASTM C 924M (ASTM C 924) and perform calculations in accordance with its Appendix. PVC plastic pipelines: UBPPA UNI-B-6 and perform calculations in accordance with its Appendix.
 - 3) Cross Connection Tests: Cross connection tests shall be observed by the Contracting Officer and the utility provider's inspector.
 - a) Perform a tracer study from the project sewer connection to the first manhole downstream on the active sewer system. Use a nontoxic, non-staining sewer tracing dye. Testing shall continue until the dye visually confirms the design connection is appropriate. During the test, the contractor shall monitor the storm drainage system (structures and outfalls) downstream from the project for any sign of cross connection.

- b) Perform a smoke test on the project sewer to verify that project storm drainage inlets or drains have not been connected to the sanitary sewer.
- f. Sanitary Sewer Manholes Verification Testing: Provide testing on sanitary sewer manholes in accordance with the state sewerage regulations. At minimum, perform hydraulic testing in accordance with ASTM C 969M (ASTM C 969).
- g. Wastewater Pump Station Verification Testing: Test the wastewater pump station in accordance with the state sewerage regulations. Conduct testing on discharge piping and force main in accordance with tests for water distribution mains; see G30, paragraph 1.3.2. Test pumps, controls, and alarms, in operation, under design conditions to ensure proper operation of all equipment.

G3030 STORM SEWER

- 1. Storm System Design and Construction: Provide the new storm sewer system and connections to the existing storm sewer system in accordance with UFC 3-201-01, Civil Engineering; the utility provider's requirements; UFC 3-210-10, Low Impact Development; the state stormwater management laws and regulations; and applicable sustainability requirements; whichever is more stringent. The Contractor shall make necessary adjustments to the drainage design in order to avoid disruption to existing utilities and to protect existing trees to remain. Confirm that the existing receiving system has adequate capacity to receive the additional stormwater flow generated by the project.
- 2. Storm Sewer System Performance Verification: At a minimum, perform the following:
 - a. Visual Test: Remove drainage structure covers and conduct a visual inspection as follows:
 - 1) Inspect for visible leaks in lines or structures.
 - 2) Inspect condition of grout in the interior joints of the structures.
 - 3) Inspect structure frames and covers for proper type and installation.
 - 4) Inspect to see if lines are free of debris.
 - 5) Inspect structure inverts.
 - 6) Check alignment and grade of gravity lines by laser or by introducing sufficient water into the line to verify the absence of sags, as directed by the Contracting Officer.
 - 7) Mirror test: Check each straight run of pipeline for gross deficiencies by holding a light in a structure; it shall show a full circle of light through the pipeline when viewed from the adjoining end of the line.

G3060 FUEL DISTRIBUTION

Gas Distribution System: Refer to Section D20 for requirements.

G40 SITE ELECTRICAL UTILITIES

G4010 ELECTRICAL DISTRIBUTION

- 1. Electrical Utilities Design and Construction:** Site electrical utilities include all exterior electrical work, including the connection to the primary distribution system. This also includes telephone and cable television supplies.

Provide electrical overhead and underground, distribution systems in accordance with IEEE C2 (National Electrical Safety Code), NFPA 70, local utilities company requirements, and local Activity guidelines.
- 2. Coordination With Local Utilities Company and Local Activity:** Service meters for electrical services shall be provided and installed in conformance with the local utilities company requirements and local activity guidelines.
- 3. Substations:** When secondary unit substations are required, the Designer of Record shall utilize UFGS Section 26 11 13, *Secondary Unit Substation*, and UFGS Section 26 23 00, *Switchboards and Switchgear*, for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.
- 4. Transformers:** When transformers are required, the Designer of Record shall utilize UFGS Section 26 12 19.10, *Three-Phase Pad Mounted Transformers*, UFGS Section 26 12 19.20, *Single-Phase Pad Mounted Transformers*, or UFGS Section 33 71 01, *Overhead Transmission and Distribution*, for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.
- 5. Switches, Controls and Devices:** When switches or control devices are required, the Designer of Record shall utilize UFGS Section 26 13 00.00 20, *SF6 Insulated Pad Mounted Switchgear*, or UFGS Section 33 71 01, *Overhead Transmission and Distribution*, for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.

G4020 EXTERIOR LIGHTING FIXTURES AND CONTROLS

- 1.** Utilize broad spectrum (white light) sources such as metal halide, induction, SSL, and fluorescent to provide good visibility at low light levels, unless lighting is required to match existing sources. The IESNA 10th Edition Handbook has developed a methodology to apply white light.
- 2.** Comply with ANSI/ASHRAE/IES 90.1-2007 for all exterior lighting applications and controls.

3. Comply with EPACT 2005, the exterior lighting power density must be below ASHRAE by 30% if considered a building load and 20% if considered a non-building load.
4. Provide surge protective device (SPD) at panelboards that include circuits feeding exterior lighting systems.
5. Coordinate the design and luminaire selection with the landscape designer. Such coordination should include the location of poles which may conflict with tree locations.
6. When exterior lighting is required the designer of record shall utilize UFGS Section 26 51 00 for the project specification section as part of the design submittal for the project and shall submit the edited specification section as a part of the design submittal for the project. Provide “dark-sky” compliant exterior light fixtures and design to minimize light trespass and light pollution.

G4030 SITE COMMUNICATION & SECURITY

1. **Telephone Distribution System:** Provide all telephone distribution systems in accordance with EIA/TIA Standards, NFPA 70, and the cognizant telephone company requirements.
2. **Cable Television System:** Provide all cable television systems in accordance with NFPA 70, and the cognizant cable television company requirements and BICSI recommendations.

PART 5 – PRESCRIPTIVE SPECIFICATIONS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

PART 5 - PRESCRIPTIVE SPECIFICATIONS

PERFORMANCE SPECIFICATIONS NOT FOUND IN UFGS STANDARD SPECIFICATIONS

PART 5 – PRESCRIPTIVE SPECIFICATIONS
REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

THIS PAGE IS INTENTIONALLY LEFT BLANK

PART 6 – ATTACHMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

**PART 6
ATTACHMENTS**

<u>Attachment No.</u>	<u>Description</u>
1	RFP Drawings
2	Existing Drawings
3	NRL Campus Map
4	FCU Pictures
5	Bid Price Schedule
6	Hazardous Material Report

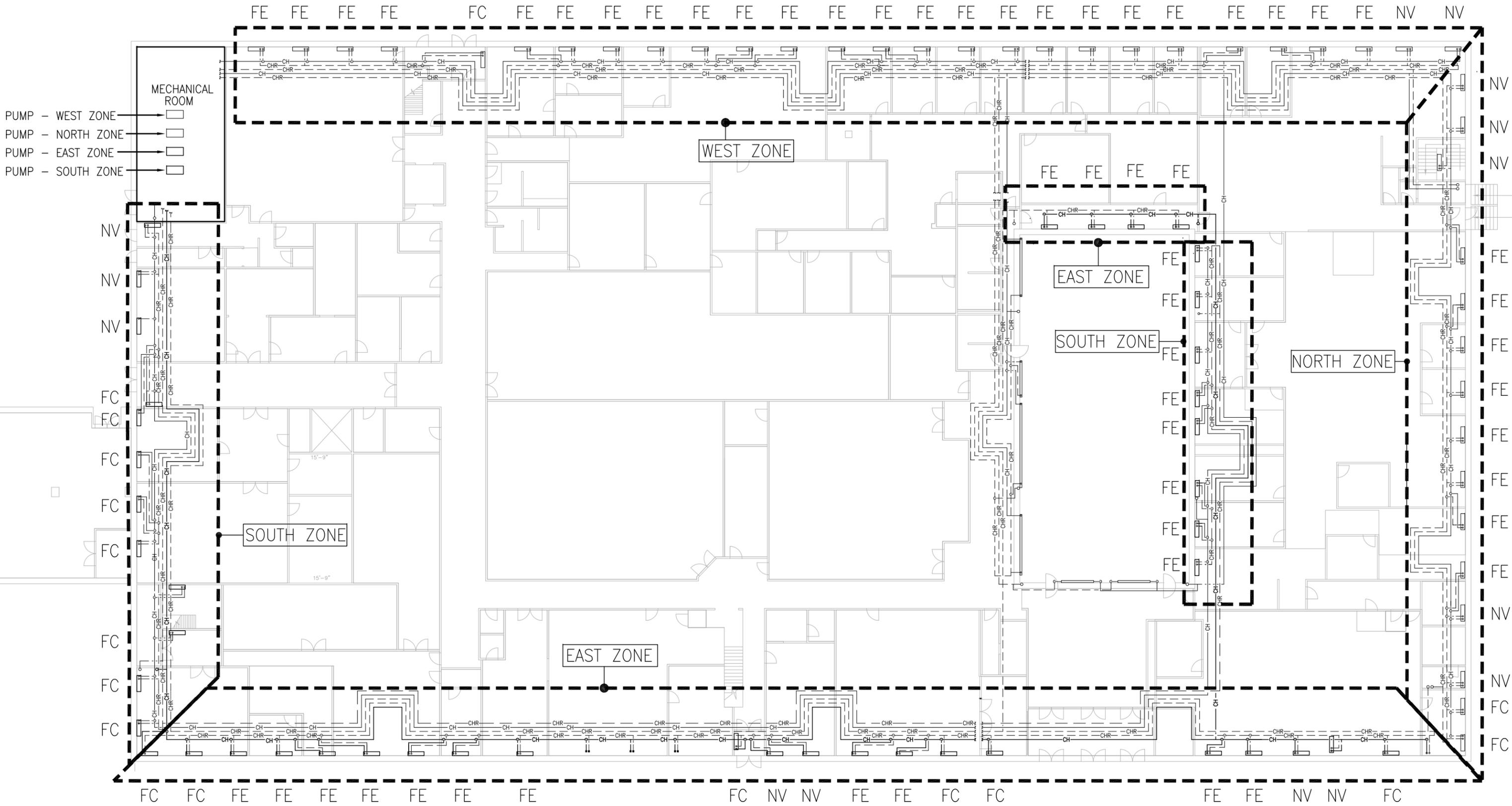
PART 6 – ATTACHMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

ATTACHMENT 1
RFP DRAWINGS

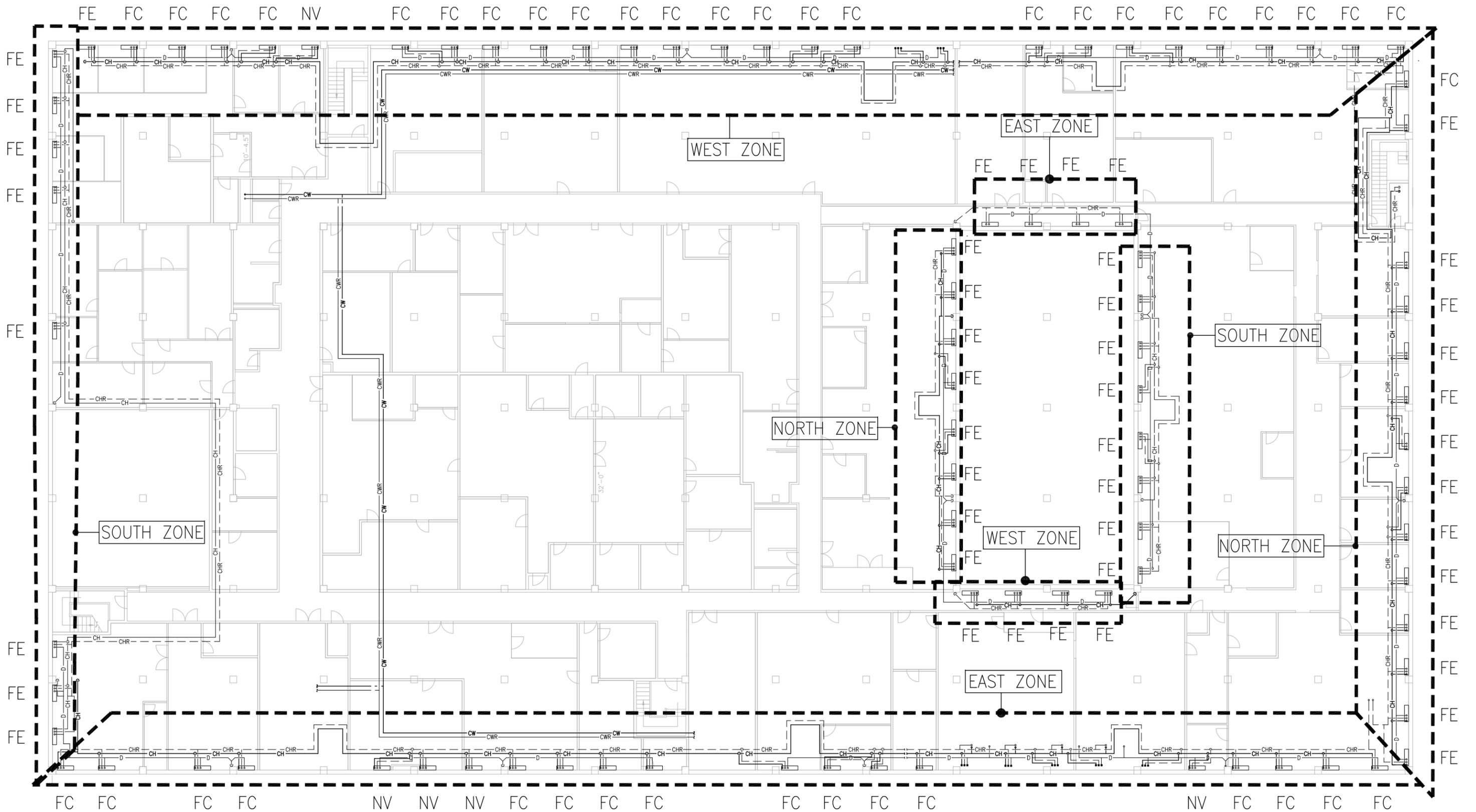
LEGEND: FC – FACTORY CABINET
 FE – FIELD ENCLOSURE
 NV – NOT VERIFIED



BUILDING 222 FIRST FLOOR PLAN – FAN COIL ZONES

FOR REFERENCE ONLY – CONTRACTOR TO FIELD VERIFY ALL FAN COILS AND PUMPS.

LEGEND: FC – FACTORY CABINET
 FE – FIELD ENCLOSURE
 NV – NOT VERIFIED



BUILDING 222 SECOND FLOOR PLAN – FAN COIL ZONES
 FOR REFERENCE ONLY – CONTRACTOR TO FIELD VERIFY ALL FAN COILS AND PUMPS.

PART 6 – ATTACHMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

ATTACHMENT 2
EXISTING DRAWINGS

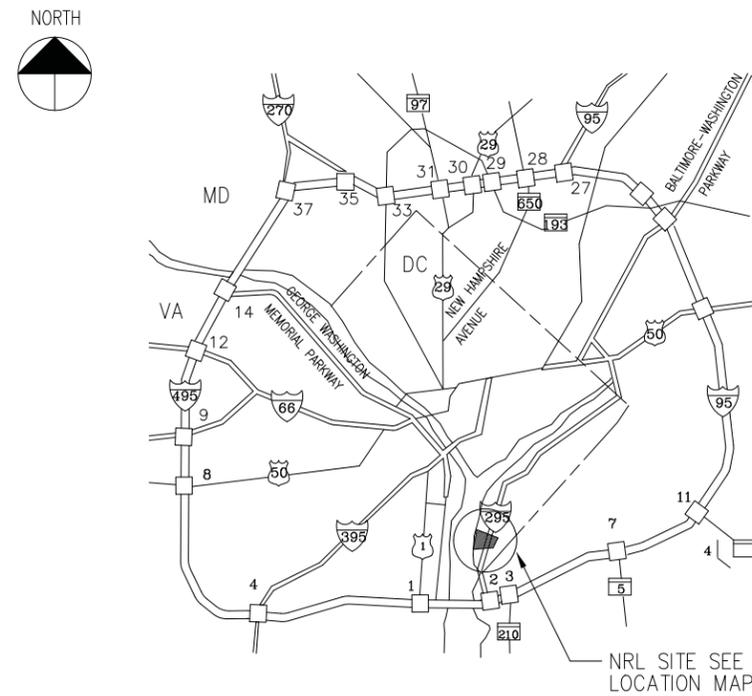
RE-PIPE HOT AND CHILLED WATER LINES, BUILDING 222

NAVAL RESEARCH LABORATORY

WASHINGTON, DC 20375-5320

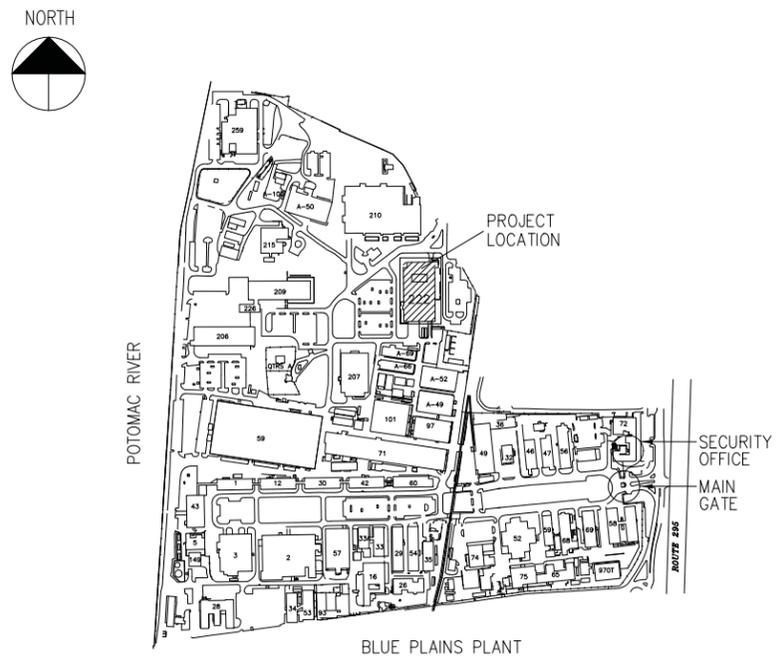
BENBASSAT & SPORIDIS COMPANY, ARCHITECTS-ENGINEERS

VICINITY MAP



NOT TO SCALE

LOCATION MAP (NRL CAMPUS)



NOT TO SCALE

INDEX OF DRAWINGS

SHEET NO.	DRAWING NO.	DRAWING TITLE	NAVFAC NO.
1	G1	COVER SHEET	3181284
2	G2	ABBREVIATIONS AND NOTES	3181285
3	A1	FIRST FLOOR PLAN	3181286
4	A2	PARTIAL FIRST FLOOR PLAN - NORTH	3181287
5	DM-1	PART FIRST FLOOR PLAN-SOUTH DEMOLITION	3181288
6	DM-2	PART FIRST FLOOR PLAN-NORTH DEMOLITION	3181289
7	DM-3	PART SECOND FLOOR PLAN-SOUTH DEMOLITION	3181290
8	DM-4	PART SECOND FLOOR PLAN-NORTH DEMOLITION	3181291
9	M-1	PART FIRST FLOOR PLAN-SOUTH	3181292
10	M-2	PART FIRST FLOOR PLAN-NORTH, DETAILS AND SCHEDULE	3181293
11	M-3	PART SECOND FLOOR PLAN-SOUTH	3181294
12	M-4	PART SECOND FLOOR PLAN-NORTH	3181295
13	M-5	FIRST AND SECOND FLOOR ZONING PLAN DETAILS AND SCHEDULE	3181296
14	M-6	FIRST AND SECOND FLOOR ZONING PLAN AND DETAILS	3181297

BENBASSAT & SPORIDIS COMPANY
ARCHITECTS & ENGINEERS
905 SILVER SPRING AVENUE
SILVER SPRING, MARYLAND 20910-4979
TELE: (301) 588-8868 FAX: (301) 495-4864

DESIGNED BY:
MECH ENGR:
SUPERVISOR:

PROFESSIONAL
CERTIFICATION

DESIGNED _____
DRAWN _____
CHECKED _____
SUPERVISOR _____
IN CHARGE _____

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
NAVAL RESEARCH LABORATORY
WASHINGTON, D.C. 20375 - 5320

RE-PIPE HOT AND CHILLED WATER LINES, BUILDING 222
NAVAL RESEARCH LABORATORY

ABBREVIATIONS

GENERAL NOTES

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPROVED

A/C	AIR CONDITIONING
ACOUS	ACOUSTICAL
AFJ	ABOVE FINISHED FLOOR
ADJ	ADJACENT
AL	ALUMINUM
APPROX	APPROXIMATE
ASSY	ASSEMBLY
BOT	BOTTOM
BD	BOARD
BLDG	BUILDING
BM	BEAM
BULKHD	BULKHEAD
CANT	CANTILEVER
CLO	CLOSET
CLG	CEILING
CMU	CONCRETE MASONRY UNIT
CONC	CONCRETE
COL	COLUMN
CONT	CONTINUOUS

L	LONG
LAV	LAVATORY
LBS	POUNDS
LF	LINEAR FOOT
MAS	MASONRY
MO	MASONRY OPENING
MAX	MAXIMUM
MAT	MATERIAL
M/E	MECHANICAL/ELECTRICAL
MTL/MET	METAL
MIN	MINIMUM
MISC	MISCELLANEOUS
MACH	MACHINE
MFR	MANUFACTURER
N	NORTH
NA	NOT APPLICABLE
NOM	NOMINAL
NTS	NOT IN CONTRACT
NO	NOT TO SCALE
NO	NUMBER
NRL	NAVAL RESEARCH LABORATORY

- THE CONTRACTOR MUST VISIT THE PREMISES AND FULLY FAMILIARIZE HIMSELF W/THE SCOPE, INTENT AND RESTRICTIONS OF THE PROJECT WORK AS DESCRIBED ON THE CONTRACT DOCUMENTS BEFORE SUBMITTING HIS BID TO THE NRL CONTRACTING OFFICER.
1a. THE CONTRACTOR MUST CLEARLY AND FULLY IDENTIFY IN HIS PROPOSAL ALL ITEMS OF WORK NEEDED FOR COMPLETING THE PROJECT REQUIREMENTS.
- THE CONTRACTOR MUST REPORT IMMEDIATELY ANY DISCREPANCIES FOUND BTW THE CONTRACT DOCUMENTS AND FIELD CONDITIONS TO THE NRL CONTRACTING OFFICER FOR CLARIFICATION AND DIRECTION.
- THE CONTRACTOR MUST PERFORM ALL PROJECT WORK IN STRICT COMPLIANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL CODES, REGULATIONS OR ORDINANCES.
- THE CONTRACTOR MUST FOLLOW ALL FEDERAL AND LOCAL ENVIRONMENTAL/SAFETY/FIRE PROTECTION RULES, REGULATIONS, AND GUIDELINES THAT ARE APPLICABLE TO THE PROJECT WORK.
- BEFORE ANY PROJECT WORK BEGINS, THE CONTRACTOR SHALL BE RESPONSIBLE IN COORDINATING WITH THE NRL CONTRACTING OFFICER FOR TERMINATION OF ANY UTILITIES TO THE BUILDING. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE IN NOTIFYING THE NRL CONTRACTING OFFICER FOR TERMINATION OF ANY UTILITIES THAT MAY AFFECT OTHER BUILDINGS, A 2 WEEKS NOTICE IS REQUIRED.
- THE CONTRACTOR SHALL BE RESPONSIBLE IN COORDINATING THE SAW-CUTTING, THE JACK-HAMMERING AND ALL OTHER NOISY EQUIPMENT WORK WITH THE NRL CONTRACTING OFFICER.
- THE CONTRACTOR SHALL PROTECT THE EXST ADJACENT FACILITIES AND BLDGS FROM ANY TYPE OF DAMAGE. THE CONTRACTOR SHALL REPAIR, REPLACE AND REFINISH THE DAMAGED AREA TO MATCH THE ADJACENT EXIST OR NEW WORK AT HIS OWN EXPENCE, AND TO THE FULL SATISFACTION OF THE NRL CONTRACTING OFFICER. THE CONTRACTOR MUST REPORT IN WRITING THE DAMAGED WORK BEFORE REPAIRS ARE MADE.
- THE CONTRACTOR SHALL REMOVE AND COMPLETELY DISPOSE "OFF" THE ENTIRE NRL CAMPUS ALL ITEMS RELATING TO DEMOLITION WORK, SUCH AS: INTERIOR FINISHES, WALLS, CEILINGS, ROOFS, DOORS, FRAMES, HARDWARE, WD, GYPBD PLYWD, MET, ETC., AND TO INCLUDE ALL ITEMS RELATED TO STRUCTURAL AND M/P/E DEMOLITION WORK IDENTIFIED IN THE CONTRACT DOCUMENTS, AS REQUIRED TO COMPLETE THE WORK.

D	DEEP
DET	DETAIL
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIM	DIMENSION
DR	DOOR
DWG	DRAWING
DS	DOWNSPOUT
DEMO	DEMOLITION
ELECT	ELECTRICAL
EL	ELEVATION
EQ	EQUAL
EQUIP	EQUIPMENT
EXST	EXISTING
EXP	EXPOSED
EXT	EXTERIOR
ENCL	ENCLOSURE
EWC	ELECTRIC WATER COOLER
ES	EACH SIDE
EA	EACH

OD	OUTSIDE DIAMETER
OFF	OFFICE
OPNG	OPENING
OVERHD	OVERHEAD
PLAS	PLASTER
PLUMB	PLUMBING
PLYWD	PLYWOOD
PNT	PAINT
PTD	PAINTED
PVC	POLYVINYL CHLORIDE
PREFAB	PREFABRICATED
PSI	POUNDS PER SQUARE INCH
PT	POINT
PVMT	PAVEMENT
PARTN	PARTITION
PTN	PARTITION
P	POLE
PL	PLATE
QT	QUARRY TILE

- THE CONTRACTOR MUST DISPOSE TRASH AND DEBRIS IN A DAILY BASIS. THE CONTRACTOR MUST MAINTAIN THE DEMOLITION AREA IN A BROOM CLEAN CONDITION AT THE END OF EACH WORKING DAY. THE CONTRACTOR MUST CONTROL THE DUST AND DIRT GENERATING FROM HIS DEMO OPERATIONS.
- ALL DIMENSIONS AND ELEVATIONS INDICATED HEREIN ARE APPROXIMATE, AND ARE NOTED ONLY FOR THE CONVENIENCE OF THE CONTRACTOR TO PREPARE HIS BID PROPOSAL. THE CONTRACTOR SHALL FIELD VERIFY AND MEASURE ALL EXST CONDITIONS, DIMENSIONS, ELEVATIONS PRIOR TO STARTING ANY WORK.
- THE PROPOSED WORK SHALL BE PERFORMED FROM THE INSIDE OF THE EXST BUILDING. THE CRAWL SPACE IS CONSIDERED A CONFINED ENTRY SPACE. SPECIAL PROVISIONS MUST BE EXERCISED BY THE CONTRACTOR FOR THE SAFETY OF PERSONS WORKING UNDER THESE CONDITIONS.
- THE CONTRACTOR MUST COORDINATE ALL ENTRIES TO THE NRL CAMPUS AND ALL EMERGENCIES WITH NDW FIRE DEPARTMENT. THE CONTRACTOR MUST SUBMIT AN EMERGENCY RESCUE PLAN TO MEET THE REQUIREMENTS OF 29CFR 1910.146(d)(9) FOR REVIEW AND APPROVAL BY THE NDW FIRE DEPARTMENT BEFORE ANY WORK BEGINS.
- THE CONSTRUCTION MAY REQUIRE TEMPORARY CLOSURE OF EGRESS TO THE BUILDING. THE CONTRACTOR IS REQUIRED TO SUBMIT A TEMPORARY EGRESS CLOSURE PLAN TO THE NDW FIRE DEPARTMENT FOR REVIEW AND APPROVAL BEFORE ANY WORK BEGINS.
- THE CONTRACTOR IS REQUIRED TO PROVIDE BARRICADES WHERE NEEDED AND TO RESTRICT UNAUTHORIZED ENTRY DURING THE CONSTRUCTION PERIOD. PROVIDE PEDESTRIAN WALKWAYS PROTECTION. IDENTIFY CLEARLY WITH PROPER SIGNAGE.
- THE CONTRACTOR IS REQUIRED TO OBTAIN FROM THE NDW FIRE DEPARTMENT ON A DAILY BASIS A HOT WORK PERMIT FOR ALL HOT WORK, SUCH AS: BURNING, SOLDERING, CUTTING, WELDING, ETC., BEFORE ANY WORK BEGINS. THE CONTRACTOR SHALL PROVIDE LOCAL EXHAUST VENTILATION TO THE OUTSIDE OF THE BUILDING ENVELOPE, ABOVE THE ROOF, TO REMOVE FUMES FROM WELDING AND SOLDERING OPERATIONS.

FIN	FINISH
FLR	FLOOR
FD	FLOOR DRAIN
FLSHG	FLASHING
FTG	FOOTING
GALV	GALVANIZED
GA	GAUGE
GL	GLASS
GOVMT	GOVERNMENT
GYPD	GYPSPUM
GWB	GYPSPUM WALLBOARD
HAND	HANDICAPPED
HDW	HARDWARE
HC	HOLLOW CORE
HM	HOLLOW METAL
HWH	HOT WATER HEATER
H	HEIGHT
HOR	HORIZONTAL
INSUL	INSULATION
INT	INTERIOR
ID	INSIDE DIAMETER
JAN CLO	JANITORS CLOSET
JT	JOINT

RD	ROUND
REG	REGISTER
REQD	REQUIRED
RESIST	RESISTANT
RM	ROOM
RB	RUBBER BASE
RLG	RAILING
SPEC	SPECIFICATION
SF	SQUARE FOOT
SIM	SIMILAR
S/S	STAINLESS STEEL
STRUCT	STRUCTURAL
SUSP	SUSPENDED
SPRKR	SPRINKLER
STL	STEEL
SQ	SQUARE
STD	STANDARD
TELE	TELEPHONE
TH	THICK
TYP	TYPICAL
UL	UNDERWRITERS LABORATORIES
VCT	VINYL COMPOSITION TILE
VEST	VESTIBULE
VIF	VERIFY IN THE FIELD
W	WIDE
W/	WITH
WP	WATERPROOFING
WIND	WINDOW
WD	WOOD
WTR	WATER
WWF	WELDED WIRE FABRIC

- THE CONTRACTOR IS REQUIRED TO MAINTAIN A NOISE LEVEL BELOW 85dB(A) IN THE BUILDING. IF THIS IS NOT POSSIBLE, THEN THE CONTRACTOR SHALL SCHEDULE THE WORK TO BE PERFORMED OUTSIDE THE REGULAR WORK HOURS.
THE CONTRACTOR SHALL SUBMIT A DEMOLITION PLAN AND COMPLY WITH 29 CFR 1926, SUBPART T, SPECIFICALLY AS IT RELATES TO THE PREPARATORY OPERATIONS OF 1926.850.
THE NRL SAFETY BRANCH MUST APPROVE THE PLAN PRIOR TO COMMENCING ANY WORK.

BENBASSAT & SPORIDIS COMPANY
ARCHITECTS & ENGINEERS
905 SILVER SPRING AVENUE
SILVER SPRING, MARYLAND 20910-4979
TELE: (301) 588-8888 FAX: (301) 495-4884

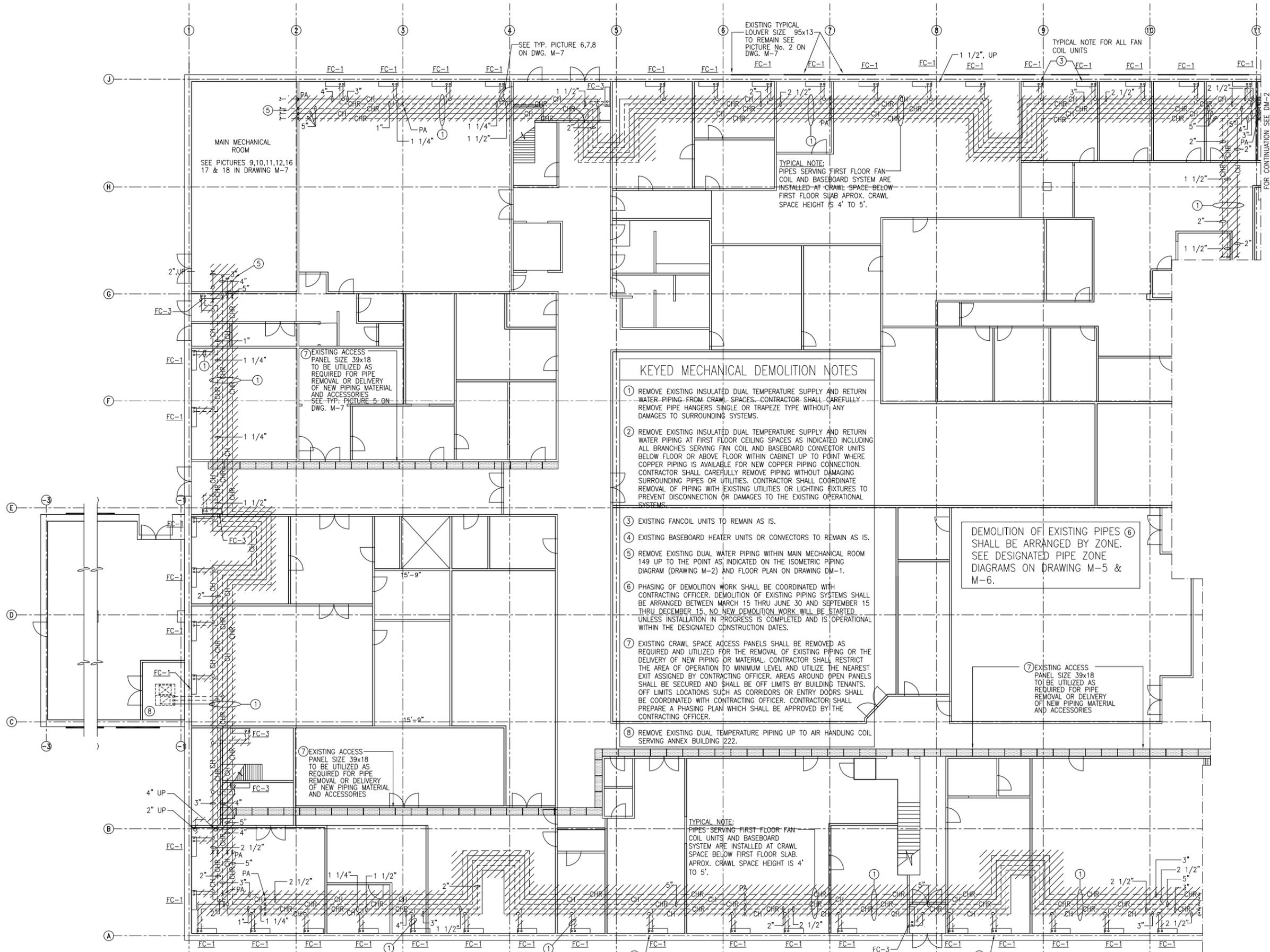
DESIGNED BY: _____
MECH ENGR: _____
DESIGNED BY: _____
MECH ENGR: _____

PROFESSIONAL CERTIFICATION

SUP'R _____
IN CHARGE _____

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
NAVAL RESEARCH LABORATORY
WASHINGTON, D.C. 20375 - 5320

RE-PIPE HOT AND CHILLED WATER LINES, BUILDING 222
NAVAL RESEARCH LABORATORY



KEYED MECHANICAL DEMOLITION NOTES

- ① REMOVE EXISTING INSULATED DUAL TEMPERATURE SUPPLY AND RETURN WATER PIPING FROM CRAWL SPACES. CONTRACTOR SHALL CAREFULLY REMOVE PIPE HANGERS SINGLE OR TRAPEZE TYPE WITHOUT ANY DAMAGES TO SURROUNDING SYSTEMS.
- ② REMOVE EXISTING INSULATED DUAL TEMPERATURE SUPPLY AND RETURN WATER PIPING AT FIRST FLOOR CEILING SPACES AS INDICATED INCLUDING ALL BRANCHES SERVING FAN COIL AND BASEBOARD CONVECTOR UNITS BELOW FLOOR OR ABOVE FLOOR WITHIN CABINET UP TO POINT WHERE COPPER PIPING IS AVAILABLE FOR NEW COPPER PIPING CONNECTION. CONTRACTOR SHALL CAREFULLY REMOVE PIPING WITHOUT DAMAGING SURROUNDING PIPES OR UTILITIES. CONTRACTOR SHALL COORDINATE REMOVAL OF PIPING WITH EXISTING UTILITIES OR LIGHTING FIXTURES TO PREVENT DISCONNECTION OR DAMAGES TO THE EXISTING OPERATIONAL SYSTEMS.
- ③ EXISTING FANCOIL UNITS TO REMAIN AS IS.
- ④ EXISTING BASEBOARD HEATER UNITS OR CONVECTORS TO REMAIN AS IS.
- ⑤ REMOVE EXISTING DUAL WATER PIPING WITHIN MAIN MECHANICAL ROOM 149 UP TO THE POINT AS INDICATED ON THE ISOMETRIC PIPING DIAGRAM (DRAWING M-2) AND FLOOR PLAN ON DRAWING DM-1.
- ⑥ PHASING OF DEMOLITION WORK SHALL BE COORDINATED WITH CONTRACTING OFFICER. DEMOLITION OF EXISTING PIPING SYSTEMS SHALL BE ARRANGED BETWEEN MARCH 15 THRU JUNE 30 AND SEPTEMBER 15 THRU DECEMBER 15. NO NEW DEMOLITION WORK WILL BE STARTED UNLESS INSTALLATION IN PROGRESS IS COMPLETED AND IS OPERATIONAL WITHIN THE DESIGNATED CONSTRUCTION DATES.
- ⑦ EXISTING CRAWL SPACE ACCESS PANELS SHALL BE REMOVED AS REQUIRED AND UTILIZED FOR THE REMOVAL OF EXISTING PIPING OR THE DELIVERY OF NEW PIPING OR MATERIAL. CONTRACTOR SHALL RESTRICT THE AREA OF OPERATION TO MINIMUM LEVEL AND UTILIZE THE NEAREST EXIT ASSIGNED BY CONTRACTING OFFICER. AREAS AROUND OPEN PANELS SHALL BE SECURED AND SHALL BE OFF LIMITS BY BUILDING TENANTS. OFF LIMITS LOCATIONS SUCH AS CORRIDORS OR ENTRY DOORS SHALL BE COORDINATED WITH CONTRACTING OFFICER. CONTRACTOR SHALL PREPARE A PHASING PLAN WHICH SHALL BE APPROVED BY THE CONTRACTING OFFICER.
- ⑧ REMOVE EXISTING DUAL TEMPERATURE PIPING UP TO AIR HANDLING COIL SERVING ANNEX BUILDING 222.

DEMOLITION OF EXISTING PIPES ⑥ SHALL BE ARRANGED BY ZONE. SEE DESIGNATED PIPE ZONE DIAGRAMS ON DRAWING M-5 & M-6.

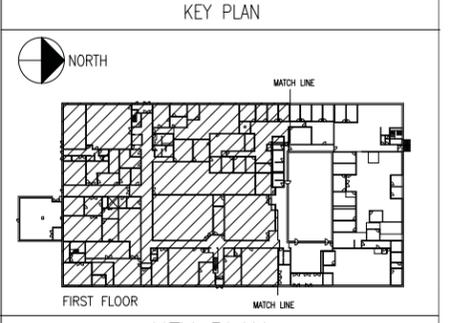
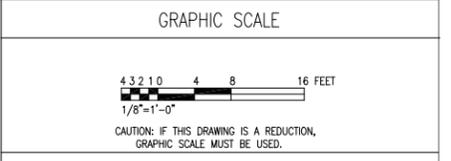
TYPICAL NOTE:
PIPES SERVING FIRST FLOOR FAN COIL UNITS AND BASEBOARD SYSTEM ARE INSTALLED AT CRAWL SPACE BELOW FIRST FLOOR SLAB. APPROX. CRAWL SPACE HEIGHT IS 4' TO 5'.

REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPROVED

NOTE:
ALL PIPES INDICATED IN THIS DRAWING ARE LOCATED AT CRAWL SPACE.

GENERAL DEMOLITION AND NEW WORK NOTES

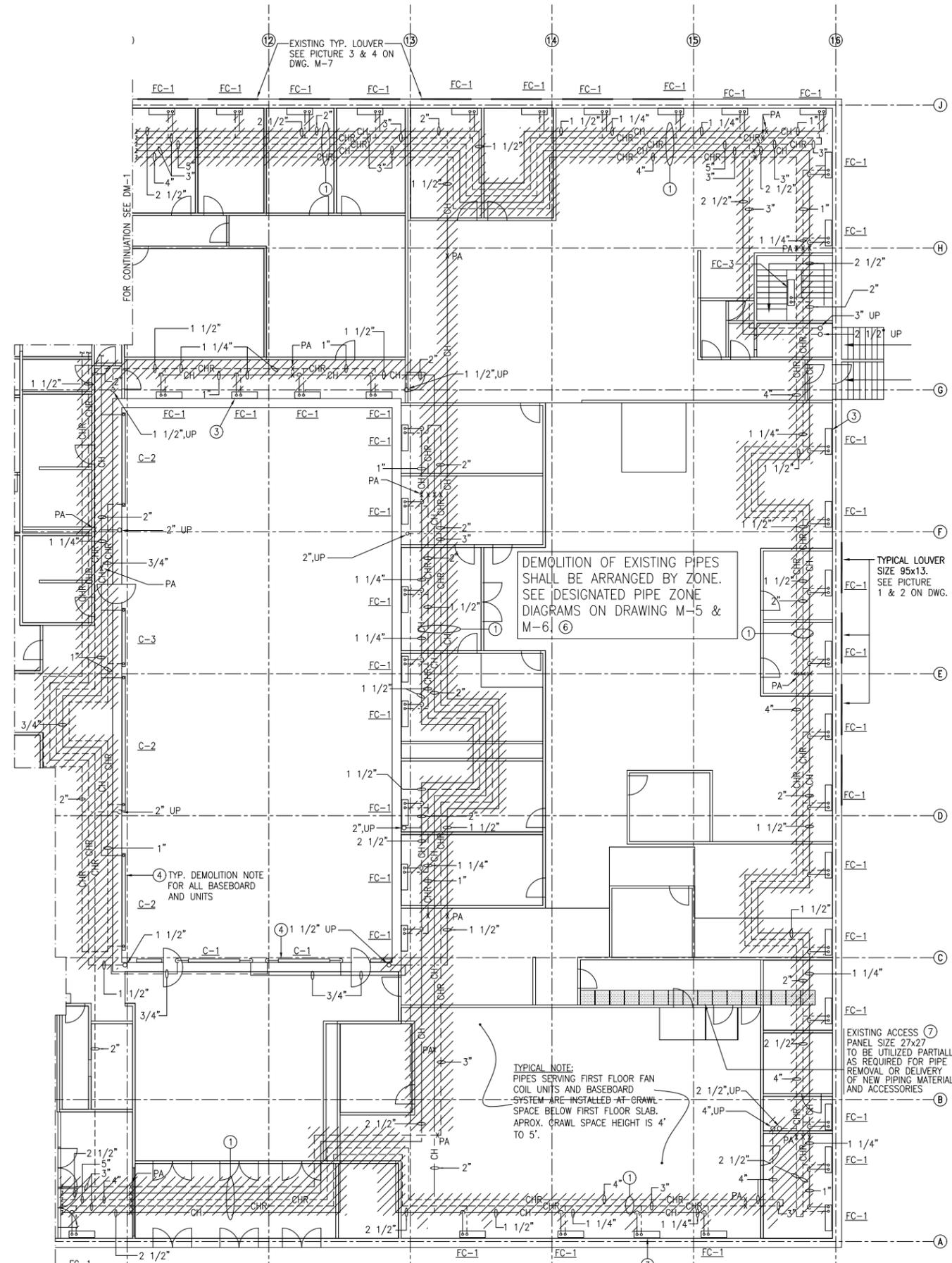
1. DEMOLITION AND NEW WORK SHOULD BE PERFORMED IN STRICT COMPLIANCE WITH THE DISTRICT OF COLUMBIA CODE AND OTHER APPLICABLE LAWS IN EFFECT AND THE GOVERNING REGULATIONS OF THE BASE AND FIRE MARSHALLS OFFICE.
2. DEMOLITION AND NEW WORK PHASING WORK SCHEDULING SHALL BE COORDINATED WITH CONTRACTING OFFICER AND THE USER OF THE BUILDING. SEE CONSTRUCTION ZONES ON DRAWING M-6.
3. CONTRACTOR SHALL UTILIZE EXISTING EXTERIOR NORTH PERIMETER CRAWL SPACE LOUVERS (AS MANY AS REQUIRED) LOCATED ON THE EAST AND THE SOUTH SIDE OF THE BUILDING FOR REMOVAL OF EXISTING STEEL DUAL TEMPERATURE PIPING AND FOR DELIVERY OF THE NEW COPPER PIPES AND ACCESSORIES. CONTRACTOR SHALL CUT AND REMOVE EXISTING SECURITY BARS AS REQUIRED TO ACCOMMODATE DEMOLITION AND NEW WORK. UPON COMPLETION OF WORK, CONTRACTOR SHALL INSTALL NEW SECURITY BARS TO MATCH EXISTING STRUCTURE.
4. SOUTH AND WEST PIPE REMOVAL AND NEW INSTALLATION OF CRAWL SPACE PIPES SHALL BE CONDUCTED BY UTILIZING MAINLY THE EXISTING FLOOR ACCESS PANELS LOCATED AT CORRIDORS OR OFFICE SPACE AS INDICATED ON FIRST FLOOR PLANS.
5. EXISTING DUAL TEMPERATURE PIPING INSULATION AND ASSOCIATED PIPING ACCESSORIES SERVING FAN COIL UNITS AT SECOND FLOOR SHALL BE REMOVED FROM FIRST FLOOR CEILING AS INDICATED ON DRAWINGS DM-3 & DM-4. AREAS TO BE DISTURBED ARE CLEARLY INDICATED ON ARCHITECTURAL DRAWING A-1. IF CEILINGS ARE DAMAGED SHOULD BE REPAIRED AS PER ARCHITECTURAL DRAWINGS AND SPECIFICATIONS TO MATCH EXISTING. LIGHTING FIXTURES SHOULD BE RE-INSTALLED AS PER ELECTRICAL DRAWINGS.
6. EXISTING SHUT-OFF AND TWO WAY AUTOMATIC TEMPERATURE CONTROL VALVES, UNIONS, AND ASSOCIATE PIPING SERVING EXISTING FANCOIL UNITS SHALL REMAIN AS IS. ALL PIPE PENETRATIONS THRU CONCRETE FLOORS SHALL BE SEALED WITH FIRE STOPPING MATERIAL.
7. EXISTING SHUT-OFF VALVES AND UNIONS SERVING PERIMETER BASEBOARD UNITS AND CONVECTORS SHALL REMAIN AS IS. PIPE PENETRATIONS THRU CONCRETE FLOOR SHALL BE SEALED WITH FIRE STOPPING MATERIAL.
8. PHASING OF NEW WORK SHALL BE COORDINATED WITH CONTRACTING OFFICER. INSTALLATION OF NEW PIPING SYSTEMS SHALL BE CONDUCTED BETWEEN MARCH 15 THRU JUNE 15 AND SEPTEMBER 15 THRU DECEMBER 15. SYSTEM SHALL BE OPERATIONAL ON OR BEFORE JUNE 30 OR DECEMBER 15 THE LATEST. NO NEW WORK SHALL BE STARTED UNLESS THERE IS ADEQUATE TIME IS AVAILABLE FOR THE COMPLETION OF NEW WORK WITHING THE DESIGNATED CONSTRUCTION DATES.



KEY PLAN		DESIGNED	
BENBASSAT & SPORIDIS COMPANY ARCHITECTS & ENGINEERS 105 SILVER SPRING AVENUE SILVER SPRING, MARYLAND 20910-4970 TELE: (301) 588-8868 FAX: (301) 495-4664		DESIGNED	DRAWN
DESIGNED BY:	PROFESSIONAL CERTIFICATION	CHECKED	SUP'VR
MECH ENGR:			IN CHARGE
PLUMB ENGR:			
FIRE ENGR:			SAFETY OFF
ELEC ENGR:			
DRAWN BY:	REGISTRATION NO.	APPROVED	DATE:
CHECKED BY:	DATE SIGNED	OFFICER IN CHARGE	DATE:

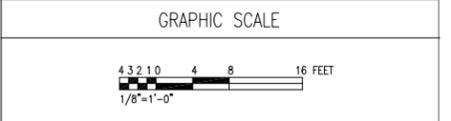
DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
NAVAL RESEARCH LABORATORY
WASHINGTON, D.C. 20375 - 5320

RE-PIPE HOT AND CHILLED WATER LINES, BUILDING 222
NAVAL RESEARCH LABORATORY

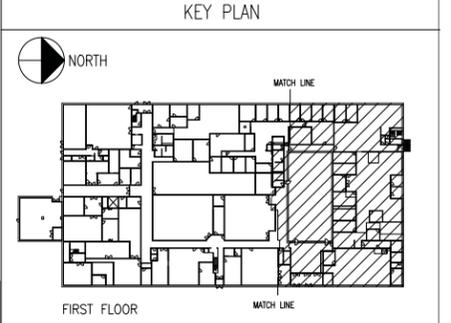


REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPROVED

NOTE:
ALL PIPES INDICATED IN THIS DRAWING ARE LOCATED AT CRAWL SPACE.



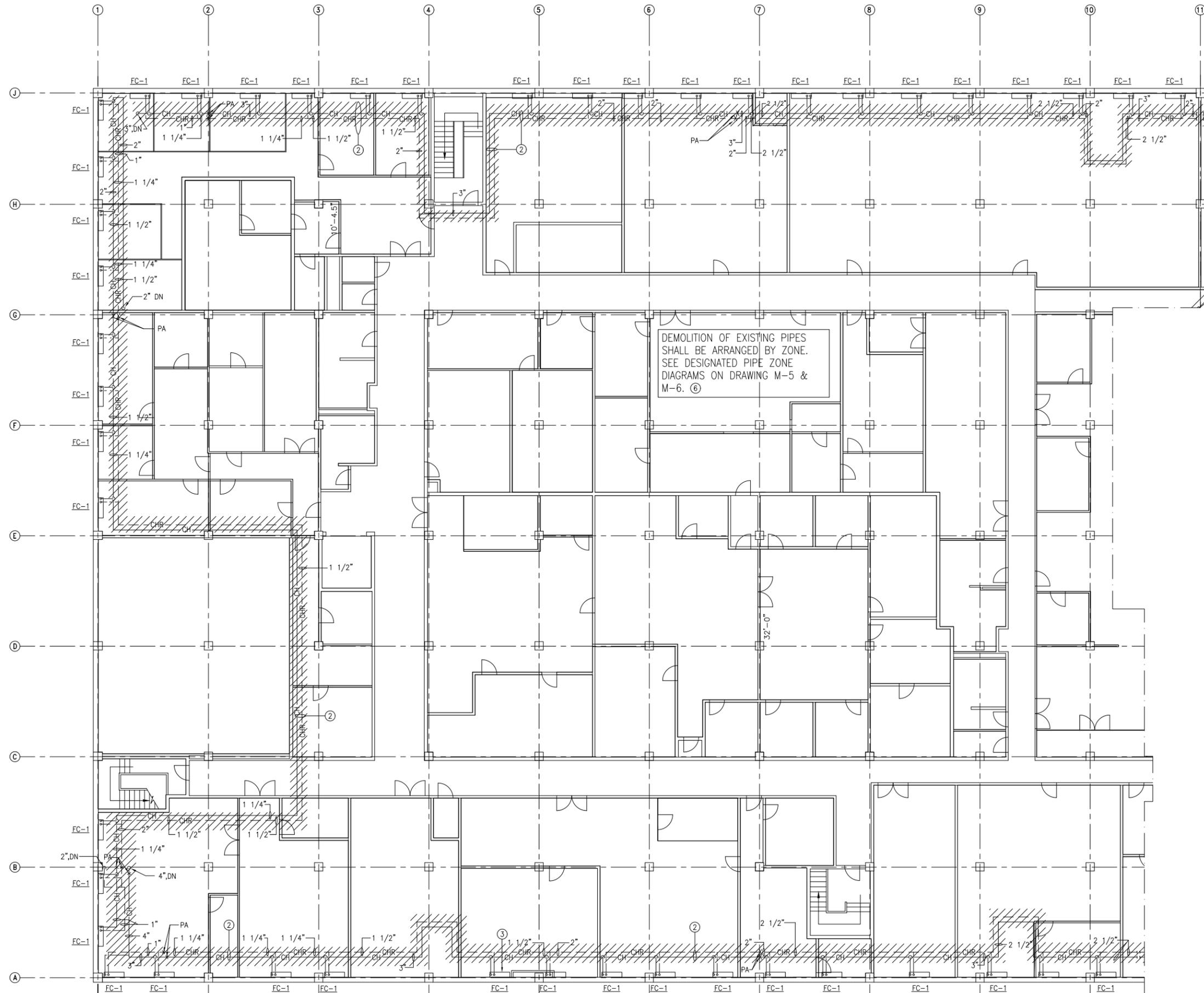
CAUTION: IF THIS DRAWING IS A REDUCTION, GRAPHIC SCALE MUST BE USED.



BENBASSAT & SPORIDIS COMPANY ARCHITECTS & ENGINEERS 905 SILVER SPRING AVENUE SILVER SPRING, MARYLAND 20910-4979 TELE: (301) 588-8868 FAX: (301) 495-4664		DESIGNED
DESIGNED BY:		DRAWN
MECH ENGR:		CHECKED
PLUMB ENGR:		SUPV'N
FIRE ENGR:		IN CHARGE
ELEC ENGR:		SAFETY OFF
DRAWN BY:		DATE:
CHECKED BY:		APPROVED
DATE SIGNED:		OFFICER IN CHARGE
DATE:		DATE:

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
NAVAL RESEARCH LABORATORY
WASHINGTON, D.C. 20375 - 5320

RE-PIPE HOT AND CHILLED WATER LINES, BUILDING 222
NAVAL RESEARCH LABORATORY



REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPROVED

NOTE:
ALL PIPES INDICATED IN THIS DRAWING ARE LOCATED AT FIRST FLOOR CEILING.

FOR CONTINUATION SEE DM-4

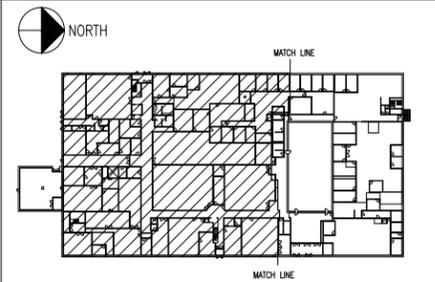
DEMOLITION OF EXISTING PIPES SHALL BE ARRANGED BY ZONE. SEE DESIGNATED PIPE ZONE DIAGRAMS ON DRAWING M-5 & M-6. ⑥

GRAPHIC SCALE



CAUTION: IF THIS DRAWING IS A REDUCTION, GRAPHIC SCALE MUST BE USED.

KEY PLAN

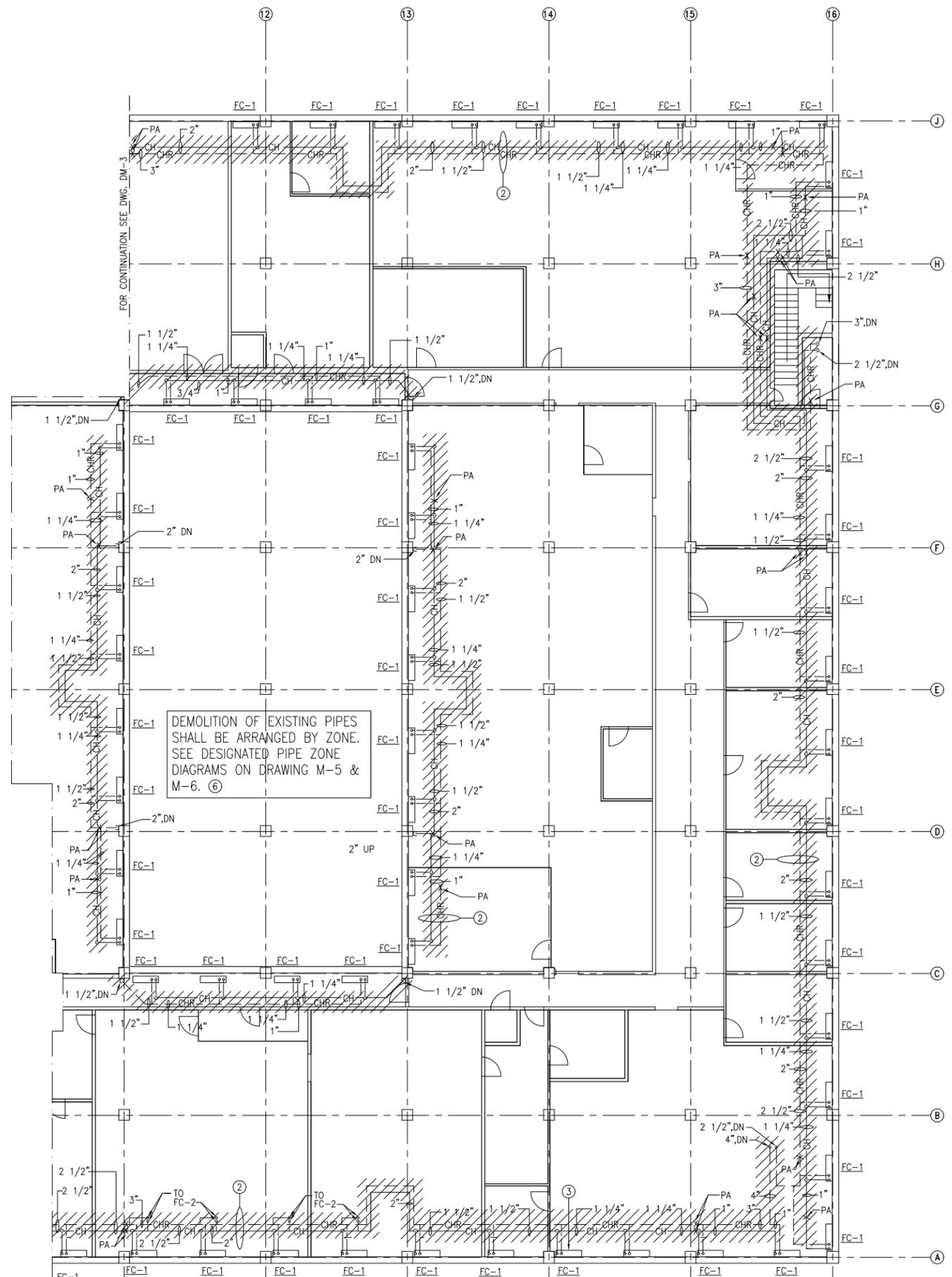


SECOND FLOOR

BENBASSAT & SPORIDIS COMPANY ARCHITECTS & ENGINEERS 105 SILVER SPRING AVENUE SILVER SPRING, MARYLAND 20910-4979 TELE (301) 588-8868 FAX (301) 495-4664		DESIGNED
DESIGNED BY:		DRAWN
MECH ENGR:	PROFESSIONAL CERTIFICATION	CHECKED
PLUMB ENGR:		SUP'N'R
FIRE ENGR:		IN CHARGE
ELEC ENGR:		SAFETY OFF
DRAWN BY:	REGISTRATION NO.	DATE:
CHECKED BY:	DATE SIGNED	APPROVED OFFICER IN CHARGE DATE:

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
NAVAL RESEARCH LABORATORY
WASHINGTON, D.C. 20375 - 5320

RE-PIPE HOT AND CHILLED WATER LINES, BUILDING 222
NAVAL RESEARCH LABORATORY



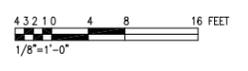
FOR CONTINUATION SEE DWG. DW-3

DEMOLITION OF EXISTING PIPES SHALL BE ARRANGED BY ZONE. SEE DESIGNATED PIPE ZONE DIAGRAMS ON DRAWING M-5 & M-6. ⑥

REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPROVED

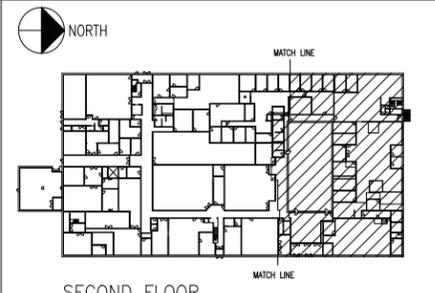
NOTE:
ALL PIPES INDICATED IN THIS DRAWING ARE LOCATED AT FIRST FLOOR CEILING.

GRAPHIC SCALE



CAUTION: IF THIS DRAWING IS A REDUCTION, GRAPHIC SCALE MUST BE USED.

KEY PLAN

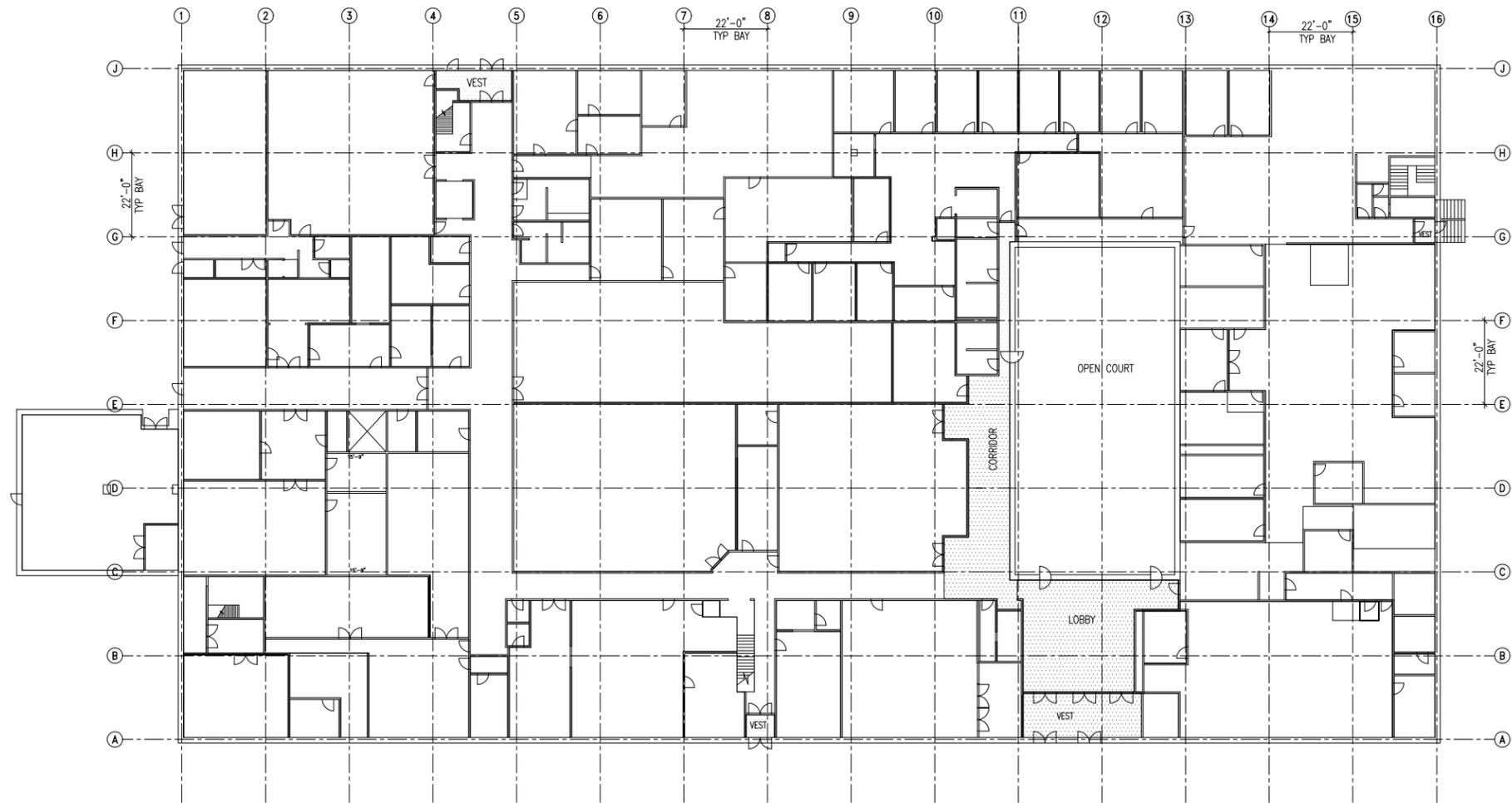


SECOND FLOOR

BENBASSAT & SPORIDIS COMPANY ARCHITECTS & ENGINEERS 4321 SILVER SPRING AVENUE SILVER SPRING, MARYLAND 20910-4975 TELE: (301) 588-8868 FAX: (301) 495-4664		DESIGNED
DESIGNED BY:		DRAWN
MECH ENGR:		CHECKED
PLUMB ENGR:		SUPV'N
FIRE ENGR:		IN CHARGE
ELEC ENGR:		SAFETY OFF
DRAWN BY:		DATE:
CHECKED BY:		APPROVED
DATE SIGNED:		OFFICER IN CHARGE
DATE:		DATE:

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
NAVAL RESEARCH LABORATORY
WASHINGTON, D.C. 20375 - 5320

RE-PIPE HOT AND CHILLED WATER LINES, BUILDING 222
NAVAL RESEARCH LABORATORY



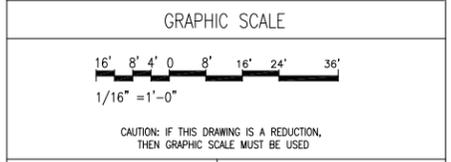
FIRST FLOOR PLAN
SCALE: 1/16" = 1'-0"

REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPROVED

- NOTES
- A. REFER TO MECHANICAL DWGS FOR PIPING LOCATIONS. THE CONTRACTOR SHALL REMOVE THE SUSPENDED ACOUSTICAL CEILING SYSTEM AT FIRST FLOOR AREAS THAT INTERFERES WITH REMOVAL OF EXIST PIPING AND THE INSTALLATION OF NEW PIPING. RE-INSTALL THE TEMPORARILY REMOVED CEILING SYSTEM AT AREAS WHERE WORK IS COMPLETED. PROTECT ADJACENT EXIST WORK FROM DAMAGE.
 - B. REFER TO MECHANICAL DWGS FOR PIPING LOCATIONS. THE CONTRACTOR SHALL REMOVE THE SUSPENDED GYPSUM BOARD CEILING SYSTEM AT FIRST FLOOR AREAS THAT INTERFERES WITH REMOVAL OF EXIST PIPING AND THE INSTALLATION OF NEW PIPING. PROVIDE AND INSTALL NEW GYPSUM BOARD CEILING SYSTEM AT AREAS WHERE WORK IS COMPLETED AT THE SAME LOCATION AND HEIGHT AS THE ONE REMOVED. PAINT THE FINISH C/O FLAT WHITE. PROTECT THE EXIST ADJACENT WORK FROM DAMAGE.
 - C. BASICALLY, THE SUSPENDED GYPSUM BOARD CEILING SYSTEM OCCURS AT VESTIBULES, LOBBIES AND CORRIDORS, AS NOTED. BALANCE OF THE CEILING SYSTEM IS ACOUSTICAL TILE WITH A 2'x2' GRID.

KEY

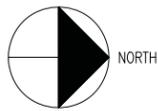
	INDICATES AREA WITH SUSPENDED GYPSUMBOARD CEILING SYSTEM
--	--



BENBASSAT & SPORIDIS COMPANY ARCHITECTS & ENGINEERS 900 SILVER SPRING AVENUE SILVER SPRING, MARYLAND 20910-4979 TELE: (301) 588-8888 FAX: (301) 495-4864		DESIGNED _____ DRAWN _____ CHECKED _____ SUPVR _____ IN CHARGE _____ SAFETY OFF _____
DESIGNED BY: _____ MECH ENGR: _____ PLUMB ENGR: _____ FIRE ENGR: _____ ELEC ENGR: _____ DRAWN BY: _____ CHECKED BY: _____	PROFESSIONAL CERTIFICATION REGISTRATION NO. _____ DATE SIGNED _____	DATE: _____ APPROVED _____ OFFICER IN CHARGE _____ DATE: _____

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
 NAVAL RESEARCH LABORATORY
 WASHINGTON, D.C. 20375 - 5320

RE-PIPE HOT AND CHILLED WATER LINES, BUILDING 222
 NAVAL RESEARCH LABORATORY



REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPROVED

NOTES

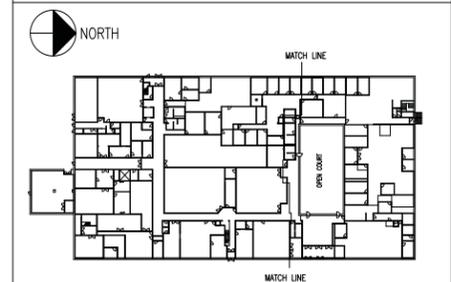
- A. REFER TO MECHANICAL DWGS FOR PIPING LOCATIONS. THE CONTRACTOR SHALL REMOVE THE SUSPENDED ACOUSTICAL CEILING SYSTEM AT FIRST FLOOR AREAS THAT INTERFERES WITH REMOVAL OF EXIST PIPING AND THE INSTALLATION OF NEW PIPING. RE-INSTALL THE TEMPORARILY REMOVED CEILING SYSTEM AT AREAS WHERE WORK IS COMPLETED. PROTECT ADJACENT EXIST WORK FROM DAMAGE.
- B. REFER TO MECHANICAL DWGS FOR PIPING LOCATIONS. THE CONTRACTOR SHALL REMOVE THE SUSPENDED GYPSUM BOARD CEILING SYSTEM AT FIRST FLOOR AREAS THAT INTERFERES WITH REMOVAL OF EXIST PIPING AND THE INSTALLATION OF NEW PIPING. PROVIDE AND INSTALL NEW GYPSUM BOARD CEILING SYSTEM AT AREAS WHERE WORK IS COMPLETED AT THE SAME LOCATION AND HEIGHT AS THE ONE REMOVED. PAINT THE FINISH CEILING, FLAT WHITE. PROTECT ADJACENT EXIST WORK FROM DAMAGE.
- C. BASICALLY, THE SUSPENDED CEILING SYSTEM OCCURS AT VESTIBULES, LOBBIES, AND CORRIDORS, AS NOTED. BALANCE OF THE SUSPENDED CEILING SYSTEM IS ACOUSTICAL TILE WITH 2'x2' GRID.

GRAPHIC SCALE



CAUTION: IF THIS DRAWING IS A REDUCTION, THEN GRAPHIC SCALE MUST BE USED

KEY PLAN

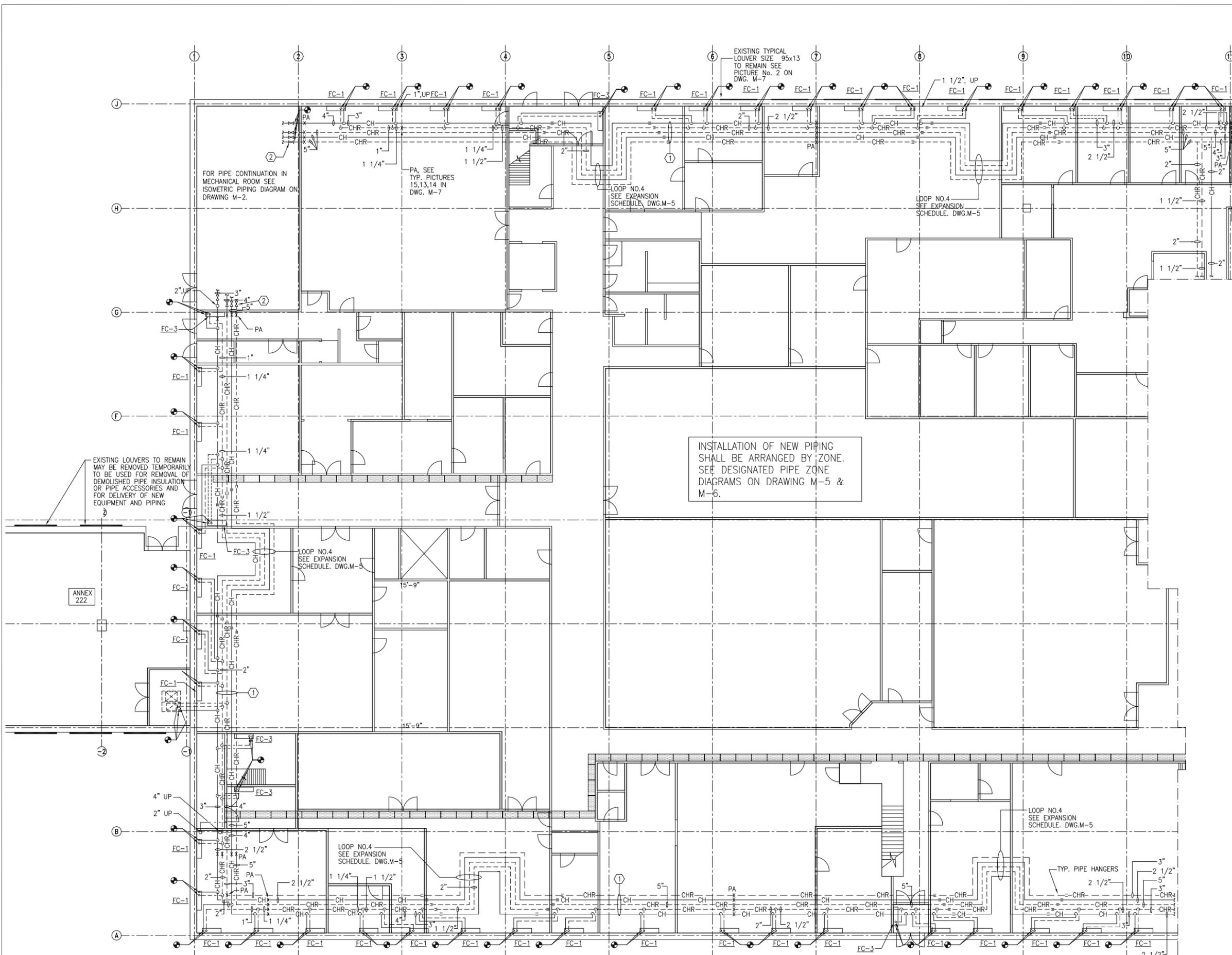


NO SCALE

BENBASSAT & SPORIDIS COMPANY ARCHITECTS & ENGINEERS 900 SILVER SPRING AVENUE SILVER SPRING, MARYLAND 20910-4979 TELE: (301) 588-8888 FAX: (301) 495-4864		DESIGNED: _____ DRAWN: _____ CHECKED: _____ SUPERVISOR: _____ IN CHARGE: _____ SAFETY OFF: _____ DATE: _____
DESIGNED BY: _____ MECH ENGR: _____ PLUMB ENGR: _____ FIRE ENGR: _____ ELEC ENGR: _____ DRAWN BY: _____ CHECKED BY: _____	PROFESSIONAL CERTIFICATION REGISTRATION NO. _____ DATE SIGNED: _____	APPROVED: _____ OFFICER IN CHARGE: _____ DATE: _____

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
 NAVAL RESEARCH LABORATORY
 WASHINGTON, D.C. 20375 - 5320

RE-PIPE HOT AND CHILLED WATER LINES, BUILDING 222
 NAVAL RESEARCH LABORATORY



REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPROVED

NOTE:
ALL NEW PIPES SHOULD BE INSTALLED WITH CRAWL SPACE BELOW FIRST FLOOR

KEYED MECHANICAL NEW WORK NOTES

- ① INSTALL NEW DUAL TEMPERATURE COPPER PIPING WITH INSULATION, HANGERS, ANCHORS AND PIPE SLEEVES AS PER SPECIFICATIONS, DETAILS AND MANUFACTURER'S RECOMMENDATIONS.
- ② PROVIDE NEW ISOLATION VALVES WITH DIELECTRIC COUPLINGS.

FOR CONTINUATION SEE M-2

EXISTING TYPICAL LOUVER SIZE 95x13 TO REMAIN SEE PICTURE No. 2 ON DWG. M-7

FOR PIPE CONTINUATION IN MECHANICAL ROOM SEE ISOMETRIC PIPING DIAGRAM ON DRAWING M-2.

PA. SEE TYP. PICTURES 15,13,14 IN DWG. M-7

LOOP NO.4 SEE EXPANSION SCHEDULE. DWG.M-5

LOOP NO.4 SEE EXPANSION SCHEDULE. DWG.M-5

1 1/2\"

2\"

1 1/2\"

2\"

1 1/4\"

1 1/2\"

1 1/4\"

1 1/2\"

1 1/4\"

1 1/2\"

1 1/4\"

1 1/2\"

1 1/4\"

1 1/2\"

1 1/4\"

1 1/2\"

1 1/4\"

1 1/2\"

1 1/4\"

1 1/2\"

1 1/4\"

1 1/2\"

1 1/4\"

1 1/2\"

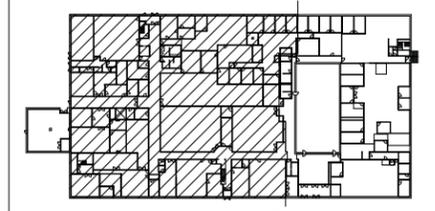
2 1/2\"

GRAPHIC SCALE



CAUTION: IF THIS DRAWING IS A REDUCTION, GRAPHIC SCALE MUST BE USED.

KEY PLAN

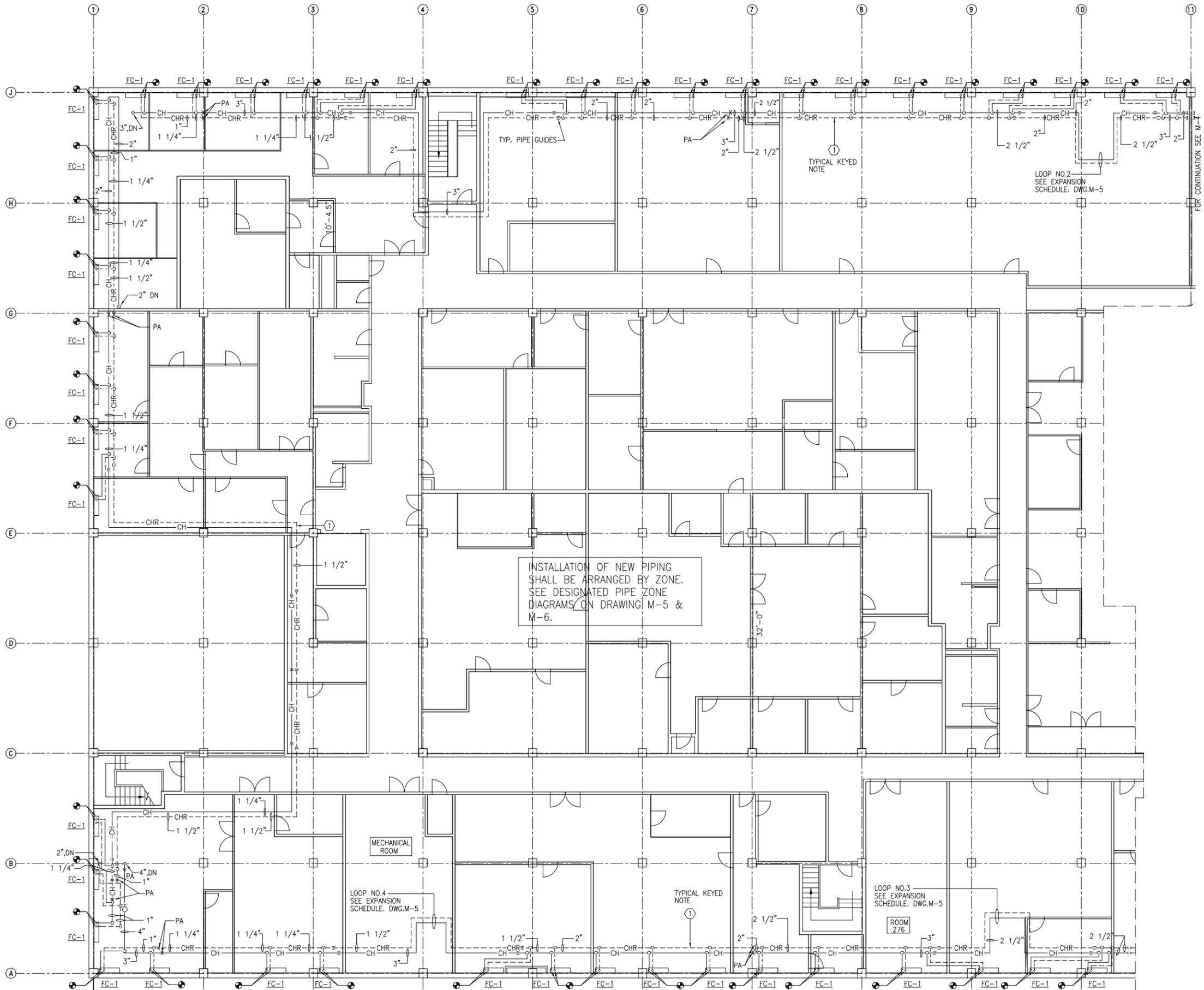


FIRST FLOOR

DESIGNED BY:	PROFESSIONAL CERTIFICATION	DESIGNED
MECH ENGR:		DRAWN
PLUMB ENGR:		CHECKED
FIRE ENGR:		SUP'VR
ELEC ENGR:		IN CHARGE
DRAWN BY:		SAFETY OFF
CHECKED BY:	REGISTRATION NO. _____	DATE: _____
	DATE SIGNED _____	APPROVED OFFICER IN CHARGE _____
		DATE: _____

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
NAVAL RESEARCH LABORATORY
WASHINGTON, D.C. 20375 - 5320

RE-PIPE HOT AND CHILLED WATER LINES, BUILDING 222
NAVAL RESEARCH LABORATORY

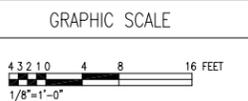


REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPROVED

NOTE:
ALL NEW PIPES SHOULD BE INSTALLED AT FIRST FLOOR CEILING

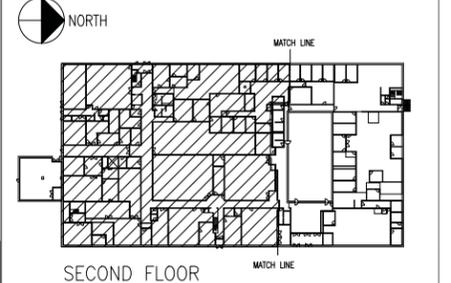
KEYED MECHANICAL NEW WORK NOTE

① INSTALL NEW DUAL TEMPERATURE COPPER PIPING WITH INSULATION, HANGERS, ANCHORS AND PIPE SLEEVES AS PER SPECIFICATIONS, DETAILS AND MANUFACTURER'S RECOMMENDATIONS.



CAUTION: IF THIS DRAWING IS A REDUCTION, GRAPHIC SCALE MUST BE USED.

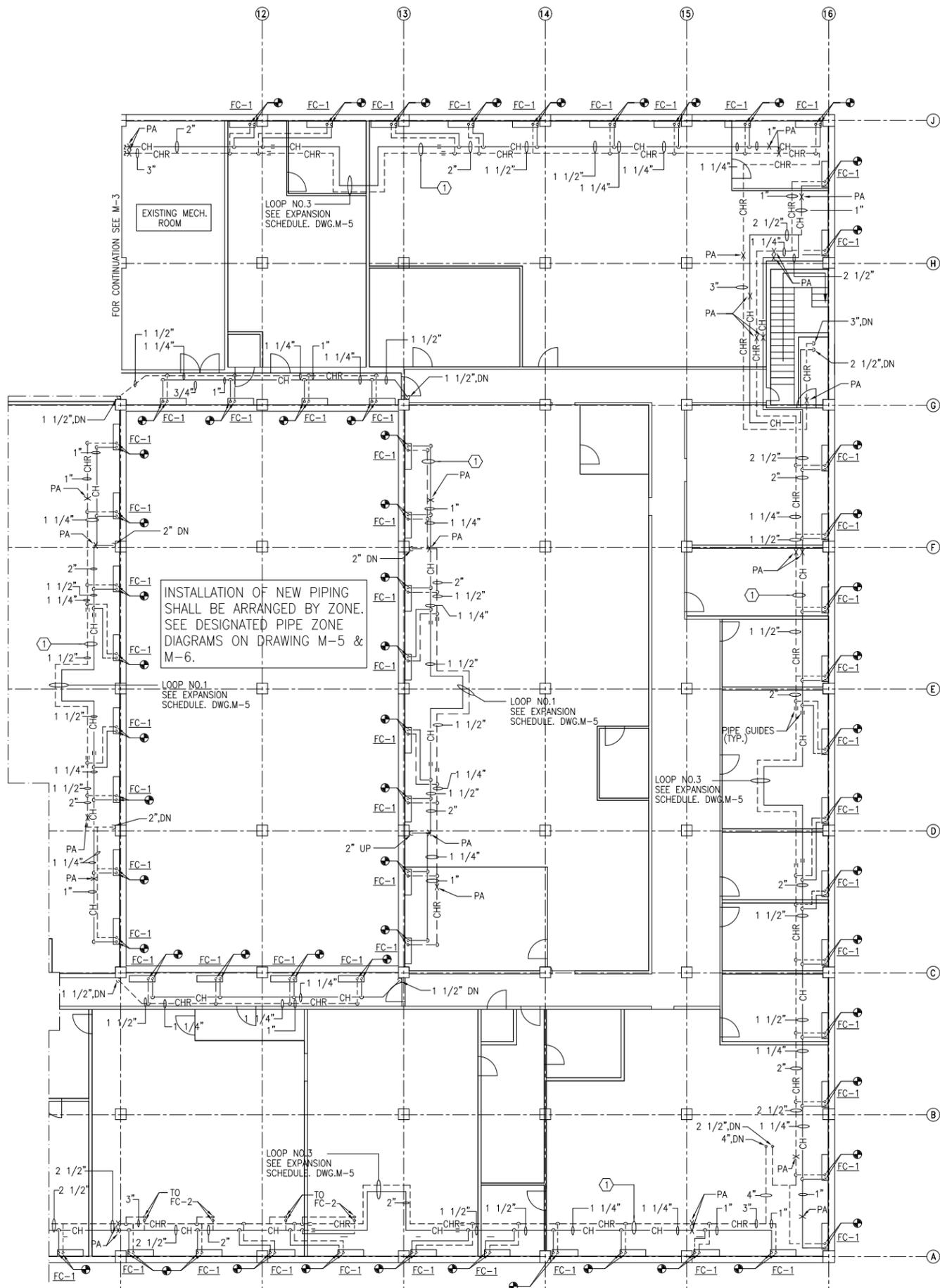
KEY PLAN



BENBASSAT & SPORIDIS COMPANY ARCHITECTS & ENGINEERS 405 SILVER SPRING AVENUE SILVER SPRING, MARYLAND 20910-4979 TELE: (301) 588-8868 FAX: (301) 495-4664		DESIGNED
DESIGNED BY:	PROFESSIONAL CERTIFICATION	DRAWN
MECH ENGR:		CHECKED
PLUMB ENGR:		SUPV'R
FIRE ENGR:		IN CHARGE
ELEC ENGR:		SAFETY OFF
DRAWN BY:	REGISTRATION NO.	APPROVED
CHECKED BY:	DATE SIGNED	OFFICER IN CHARGE
		DATE:

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
NAVAL RESEARCH LABORATORY
WASHINGTON, D.C. 20375 - 5320

RE-PIPE HOT AND CHILLED WATER LINES, BUILDING 222
NAVAL RESEARCH LABORATORY



REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPROVED

NOTE:
ALL NEW PIPES SHOULD BE INSTALLED AT FIRST FLOOR CEILING

KEYED MECHANICAL NEW WORK NOTES

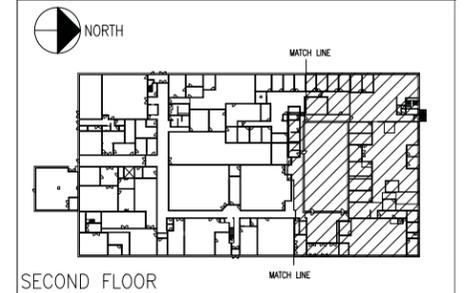
- ① INSTALL NEW DUAL TEMPERATURE COPPER PIPING WITH INSULATION, HANGERS, ANCHORS AND PIPE SLEEVES AS PER SPECIFICATIONS, DETAILS AND MANUFACTURER'S RECOMMENDATIONS.

GRAPHIC SCALE



CAUTION: IF THIS DRAWING IS A REDUCTION, GRAPHIC SCALE MUST BE USED.

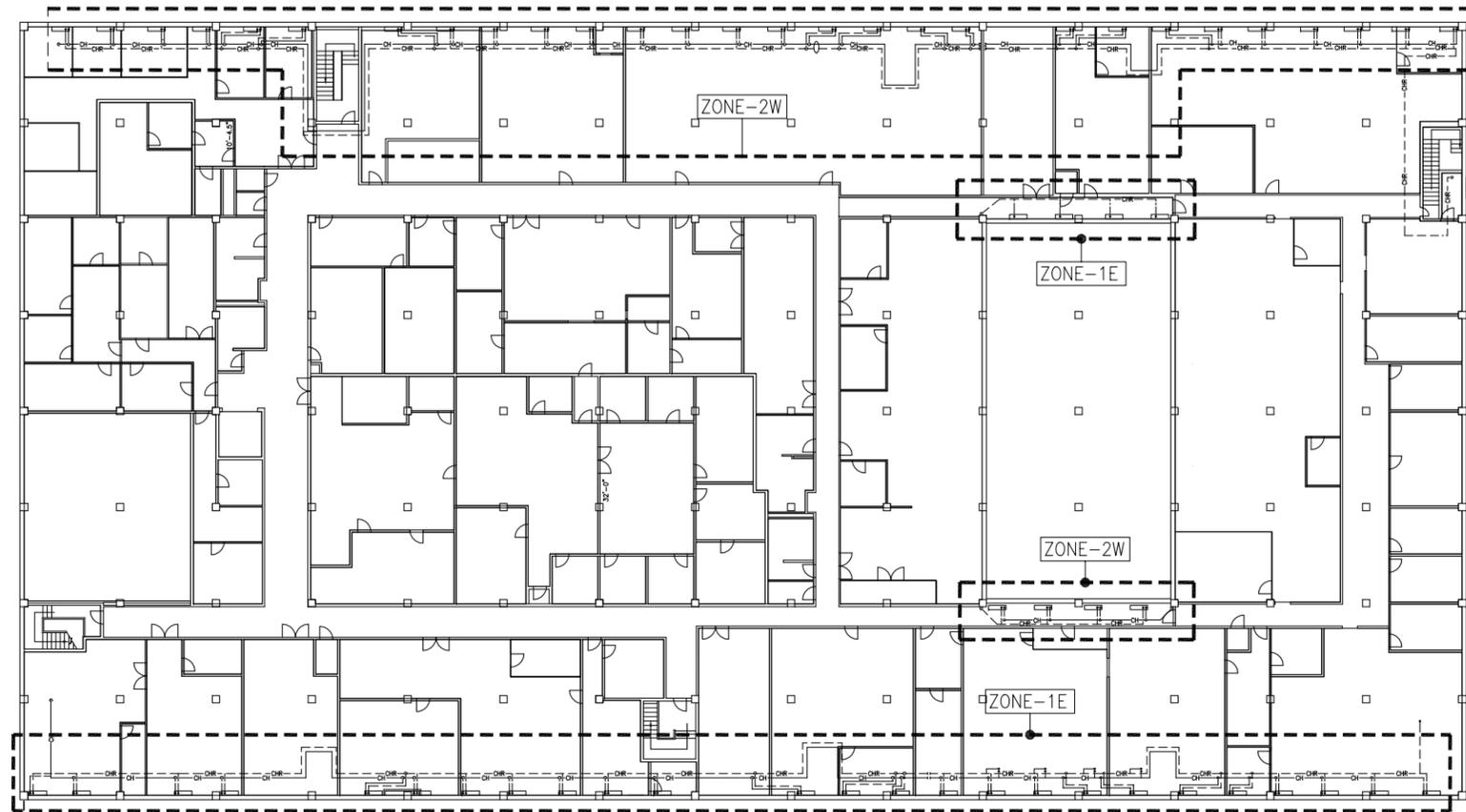
KEY PLAN



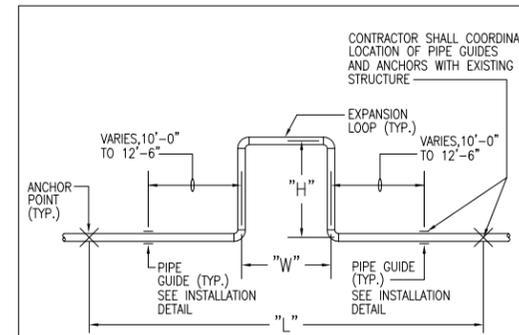
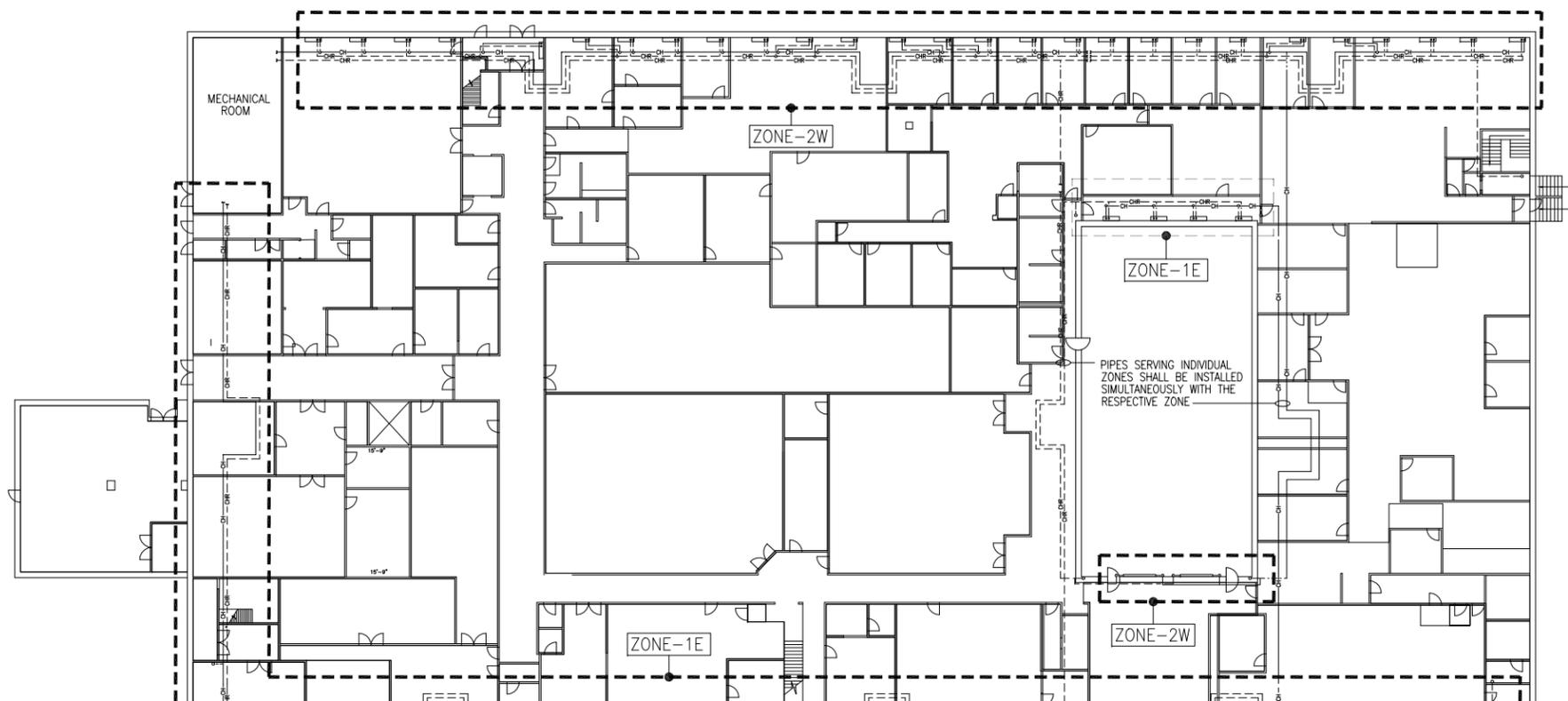
BENBASSAT & SPORIDIS COMPANY ARCHITECTS & ENGINEERS 905 SILVER SPRING AVENUE SILVER SPRING, MARYLAND 20910-4970 TELE: (301) 588-8868 FAX: (301) 496-4664		DESIGNED
DESIGNED BY:		DRAWN
MECH ENGR:		CHECKED
PLUMB ENGR:		SUPV'R
FIRE ENGR:		IN CHARGE
ELEC ENGR:		SAFETY OFF
DRAWN BY:		DATE:
REGISTRATION NO.:		APPROVED
CHECKED BY:		OFFICER IN CHARGE
DATE SIGNED:		DATE:

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
NAVAL RESEARCH LABORATORY
WASHINGTON, D.C. 20375 - 5320

RE-PIPE HOT AND CHILLED WATER LINES, BUILDING 222
NAVAL RESEARCH LABORATORY



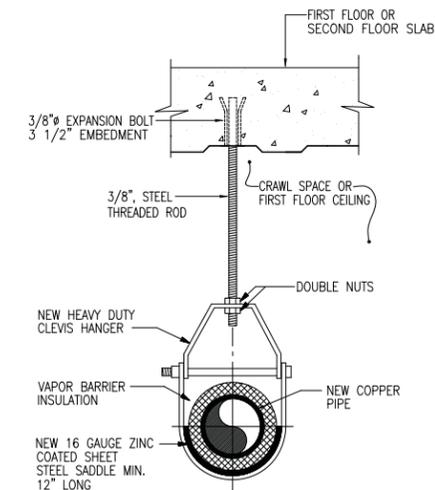
SECOND FLOOR PLAN - ZONE-2W & ZONE-1E
SCALE: 1/16" = 1'-0" (APPLICABLE FOR DEMOLITION AND NEW WORK)



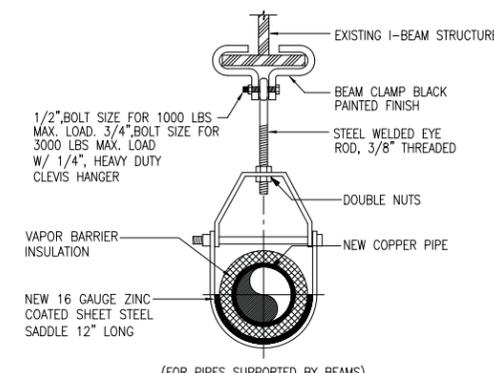
TYPICAL EXPANSION LOOP DETAIL
NO SCALE

EXPANSION LOOP DIMENSION SCHEDULE

EXPANSION LOOP No.	TOTAL EXPANSION (INCH)	L" (FEET)	W" (FEET, INCH)	H" (FEET)	REMARKS
1	1.01	52	2'6"	5	INNER LOOP
2	1.94	100	3'0"	6	INNER LOOP
3	2.14	110	3'6"	7	INNER LOOP
4	2.22	111	4'6"	9	INNER LOOP



TYPICAL PIPE HANGER DETAIL
NO SCALE (FOR PIPE SUPPORTED BY FLOOR STRUCTURE)

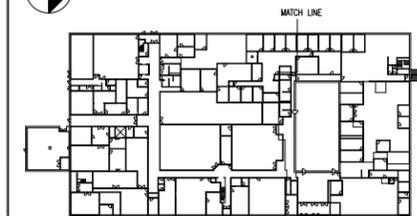


REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPROVED

GRAPHIC SCALE

CAUTION: IF THIS DRAWING IS A REDUCTION, GRAPHIC SCALE MUST BE USED.

KEY PLAN



BENBASSAT & SPORIDIS COMPANY
ARCHITECTS & ENGINEERS
902 SILVER SPRING AVENUE
SILVER SPRING, MARYLAND 20910-4979
TEL: (301) 588-8888 FAX: (301) 495-4864

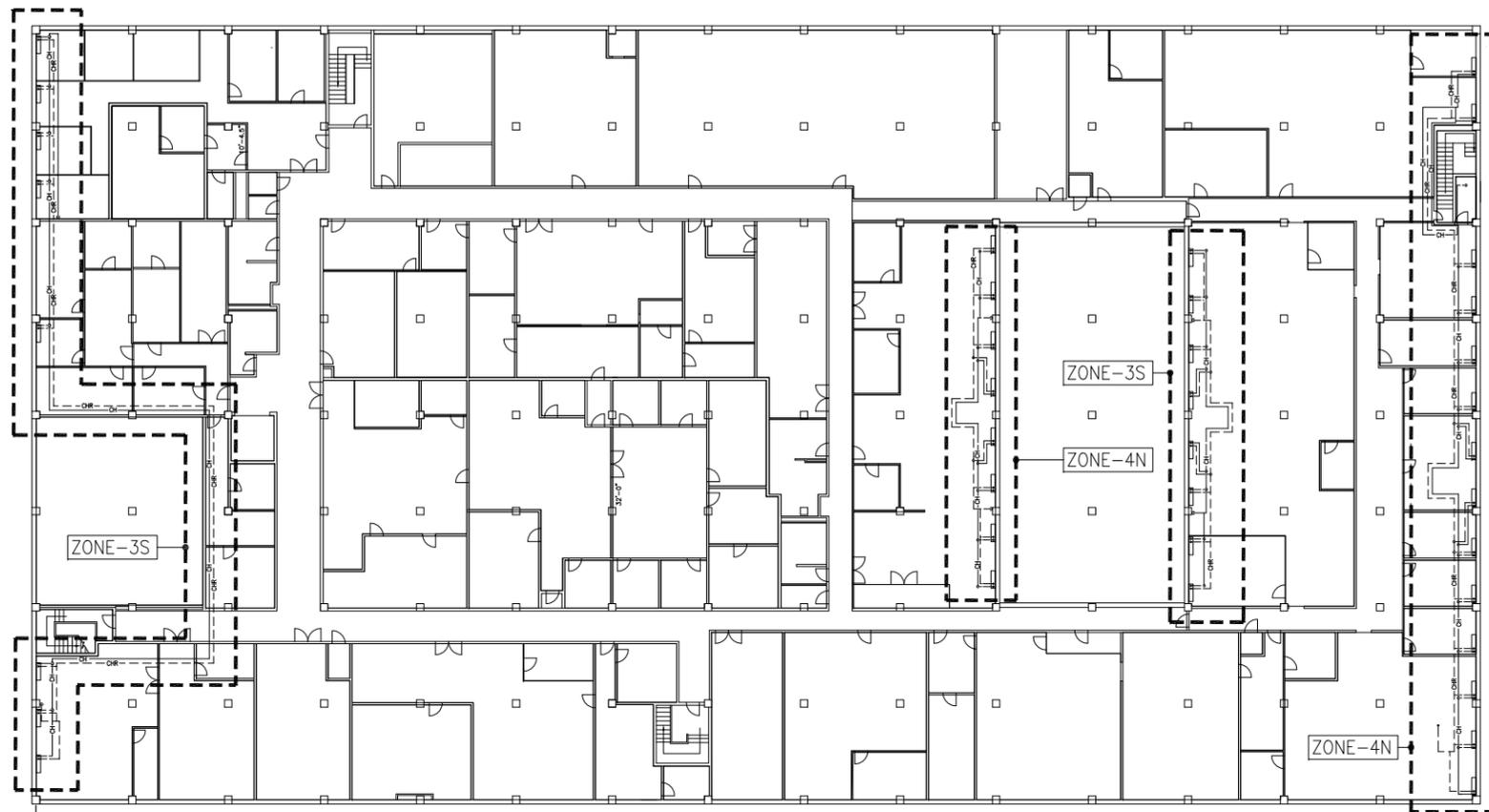
DESIGNED BY: _____
MECH ENGR: _____
FLUMB ENGR: _____
FIRE ENGR: _____
ELEC ENGR: _____
DRAWN BY: _____
CHECKED BY: _____

PROFESSIONAL CERTIFICATION

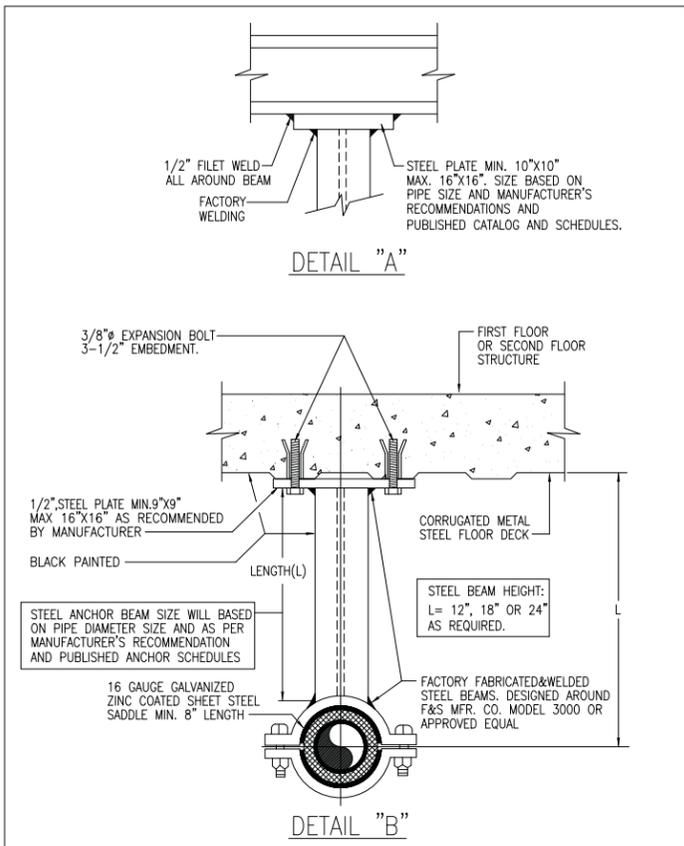
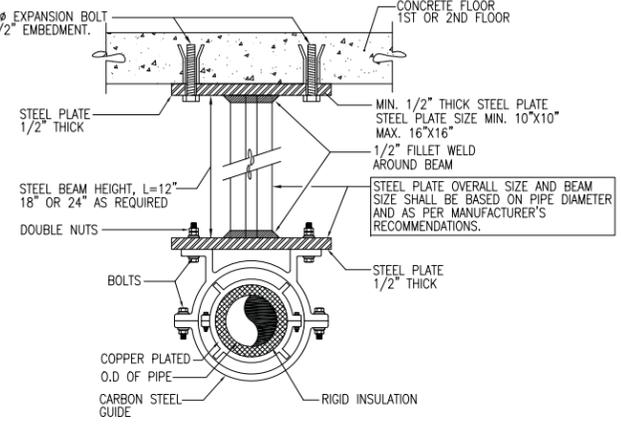
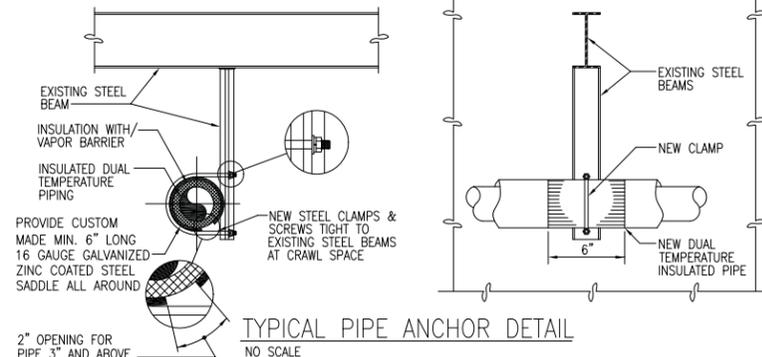
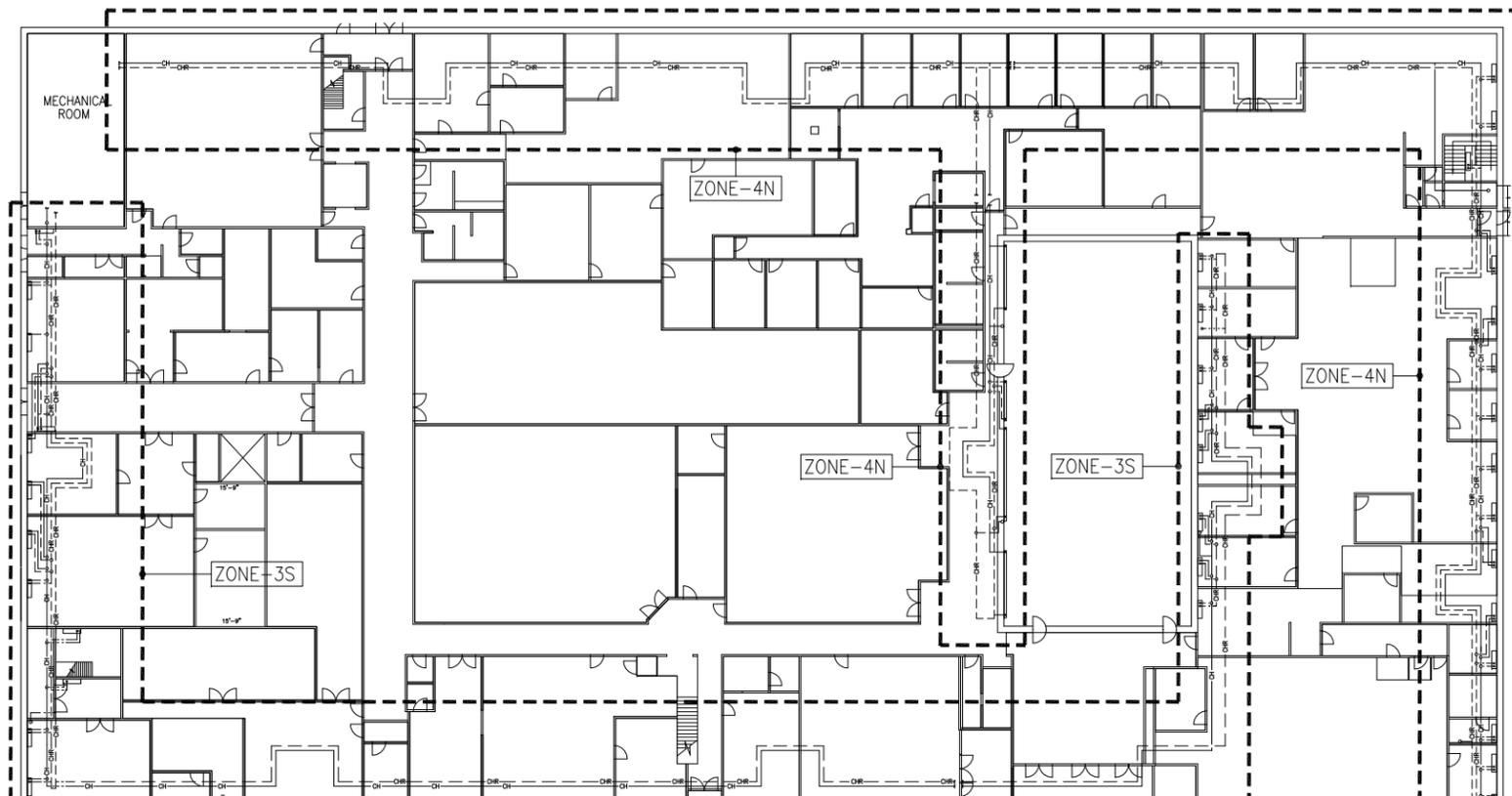
DATE SIGNED: _____

DESIGNED _____
DRAWN _____
CHECKED _____
SUP'VR _____
IN CHARGE _____
SAFETY OFF _____
DATE: _____
APPROVED _____
OFFICER IN CHARGE _____
DATE: _____

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
NAVAL RESEARCH LABORATORY
WASHINGTON, D.C. 20375 - 5320



SECOND FLOOR PLAN - ZONE-3S & ZONE-4N
SCALE: 1/16" = 1'-0" (APPLICABLE FOR DEMOLITION AND NEW WORK)



REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPROVED

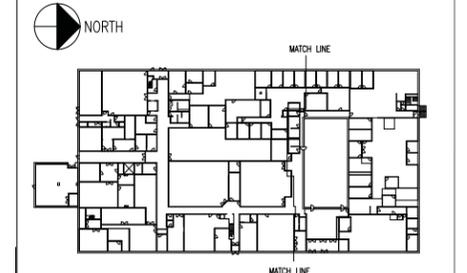
SYMBOLS & ABBREVIATIONS

- FC-1 EXISTING FAN COIL UNIT RADIATION UNIT (REMAIN AS IS)
- C-1 EXISTING BASEBOARD FIN TUBE RADIATION UNIT (REMAIN AS IS)
- CH- EXISTING DUAL TEMPERATURE WATER SUPPLY PIPING STEEL SCHEDULE 40 WITH INSULATION AND HANGERS TO BE REMOVED
- CHR- EXISTING DUAL TEMPERATURE WATER RETURN PIPING STEEL SCHEDULE 40 WITH INSULATION AND HANGERS TO BE REMOVED
- CH- EXISTING PIPING ANCHORS AT CRAWL SPACE SHALL BE USED TO ACCOMMODATE NEW PIPING SYSTEM. EXISTING PIPING ANCHORS AT FIRST FLOOR CEILING TO BE REMOVED.
- CH- NEW INSULATED DUAL TEMPERATURE SUPPLY PIPING. COPPER TYPE "L" WITH HANGERS
- CHR- NEW INSULATED DUAL TEMPERATURE RETURN PIPING. COPPER TYPE "L" WITH HANGERS
- X- NEW PIPE ANCHORS
- NEW PIPING GUIDES
- CONNECT NEW WORK TO EXISTING
- EXISTING GATE VALVE TO BE REMOVED
- NEW GATE VALVE
- UNION
- DIAMETER

GRAPHIC SCALE

CAUTION: IF THIS DRAWING IS A REDUCTION, GRAPHIC SCALE MUST BE USED.

KEY PLAN



BENBASSAT & SPORIDIS COMPANY ARCHITECTS & ENGINEERS 905 SILVER SPRING AVENUE SILVER SPRING, MARYLAND 20910-4979 TELE: (301) 588-8868 FAX: (301) 496-4664		DESIGNED DRAWN CHECKED SUP'FR IN CHARGE
DESIGNED BY: MECH ENGR: PLUMB ENGR: FIRE ENGR: ELEC ENGR: DRAWN BY: CHECKED BY:	PROFESSIONAL CERTIFICATION	SAFETY OFF DATE: APPROVED OFFICER IN CHARGE DATE:

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
NAVAL RESEARCH LABORATORY
WASHINGTON, D.C. 20375 - 5320

RE-PIPE HOT AND CHILLED WATER LINES, BUILDING 222
NAVAL RESEARCH LABORATORY

1. NORTH ELEVATION, CRAWL SPACE LOUVERS WITH STEEL SECURITY BARS



2. TYPICAL CRAWL SPACE LOUVERS AT NORTH ELEVATION WITH PARTIAL REMOVED SECURITY BARS UTILIZED FOR PRESENT REPAIRS.



3. WEST ELEVATION CRAWL SPACE ACCESS LOUVERS WITH STEEL SECURITY BARS.



4. WEST ELEVATION, CRAWL SPACE ACCESS LOUVERS WITH STEEL SECURITY BARS



5. TYPICAL INTERIOR, FIRST FLOOR ACCESS FLOOR PANELS TO CRAWL SPACE BELOW



6. TYPICAL EXISTING DUAL TEMPERATURE INSULATED PIPING, CONDENSATE DRAIN AND BRANCH PIPING SERVING FAN COIL UNITS AT FIRST FLOOR.



7. TYPICAL VIEW OF EXISTING DUAL TEMPERATURE INSULATED PIPING FROM CRAWL SPACE LOUVERS AT NORTH ELEVATION



8. TYPICAL VIEW OF EXISTING INSULATED DUAL TEMPERATURE BRANCH PIPING AND CONDENSATE DRAIN PIPING SERVING FAN COIL UNIT AT FIRST FLOOR WITH TYPICAL TRAPEZE HANGERS



9. PROPOSED LOCATION OF ISOLATION VALVES AND TERMINATION OF NEW PIPING WORK WITHIN EXISTING MECHANICAL ROOM M-149 AT FIRST FLOOR



10. EXISTING RUSTED CONTROL VALVES, PIPES & PIPING AND DAMAGED INSULATION OF EXISTING HYDRONIC DUAL TEMPERATURE SYSTEM WITHIN EXISTING MECHANICAL ROOM M-149.



11. EXISTING DAMAGED PIPING AND PUMP INSULATION WITHIN EXISTING MECHANICAL ROOM M-149.



12. EXISTING DAMAGED PIPING AND PUMP INSULATION WITHIN EXISTING MECHANICAL ROOM M-149.



13. EXISTING PIPE ANCHOR BEAM SYSTEM AT CRAWL SPACE. THAT SHOULD BE UTILIZED AS REQUIRED.



14. EXISTING PIPE ANCHOR BEAM SYSTEM AT CRAWL SPACE. THAT SHOULD BE UTILIZED AS REQUIRED.



15. TYPICAL STEEL BEAM SYSTEM AT CRAWL SPACE SHALL BE UTILIZED TO HANG TRAPEZE OR SINGLE PIPE HANGERS AS REQUIRED.



16. EXISTING RUSTED PUMP BASES AND EXISTING PIPE AND CONNECTION FLANGES.



17. TYPICAL EXISTING AND EXPANSION TANK AND STEAM TO HOT WATER HEAT EXCHANGER WITHIN MECH. ROOM M-149.



18. TYPICAL EXISTING AND EXPANSION TANK AND STEAM TO HOT WATER HEAT EXCHANGER WITHIN MECH. ROOM M-149.



REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPROVED

BENBASSAT & SPORIDIS COMPANY ARCHITECTS & ENGINEERS 405 SILVER SPRING AVENUE SILVER SPRING, MARYLAND 20910-4975 TELE: (301) 588-8868 FAX: (301) 495-4664		DESIGNED
DESIGNED BY:	PROFESSIONAL CERTIFICATION	SUPV'N
MECH ENGR:		IN CHARGE
PLUMB ENGR:		
FIRE ENGR:		SAFETY OFF
ELEC ENGR:		
DRAWN BY:	REGISTRATION NO.	DATE:
CHECKED BY:	DATE SIGNED	APPROVED OFFICER IN CHARGE DATE:

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
NAVAL RESEARCH LABORATORY
WASHINGTON, D.C. 20375 - 5320

RE-PIPE HOT AND CHILLED WATER LINES, BUILDING 222
NAVAL RESEARCH LABORATORY

PART 6 – ATTACHMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

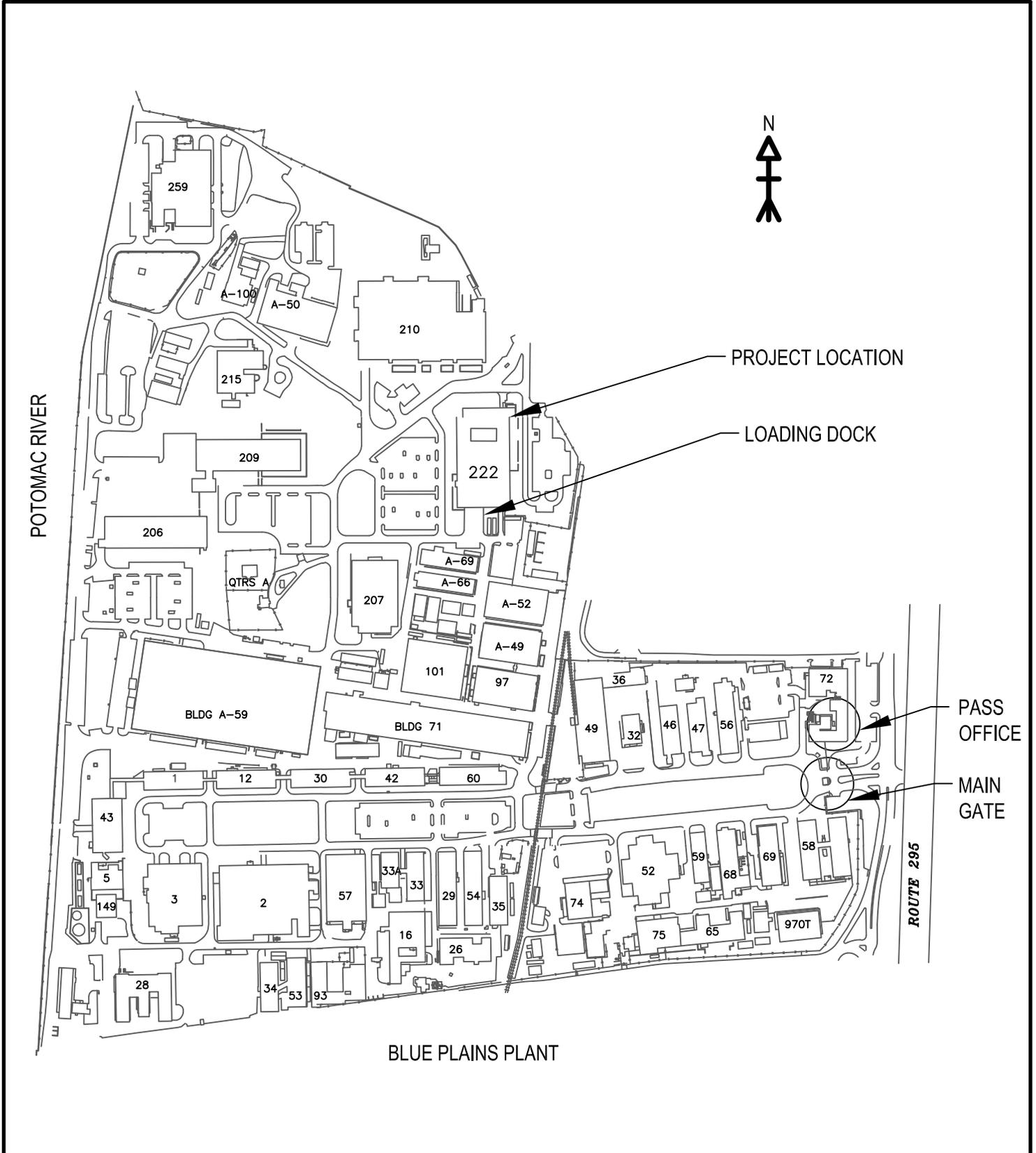
WORK ORDER NO. 1327210
APRIL 17, 2015

ATTACHMENT 3
NRL CAMPUS MAP



1100 North Glebe Rd., Suite 500
Arlington, Virginia 22201 USA
1.571.218.1000 Fax: 1.571.218.1400

PROJECT NAVAL RESEARCH LABORATORY WASHINGTON, D.C.			BUILDING 222		SKETCH NO. --
DRAWING TITLE SITE MAP			PROJECT NO. FDWD9472		
REF. DRAWING N/A	DRAWN BY. JEG	CHECKED BY.	SUBMITTAL -	DATE 7/17/2014	PAGE 1 OF 1



PART 6 – ATTACHMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
FEBRUARY 20, 2015

THIS PAGE IS INTENTIONALLY LEFT BLANK

PART 6 – ATTACHMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

ATTACHMENT 4
FCU PICTURES



7 1:56PM



7 1:57PM



7 1:57PM



YET YOU DO NOT HAVE BECAUSE YOU DO NOT ASK.

7 1:57PM



answered."
DO NOT HAVE
prayed

Duplicate
MULTIMEDIA

7 1:58PM



7 2:04PM



7 2:04PM



7 2:04 PM



7 2:05PM



7 2:06PM



7 2:06PM



7 2:08PM



7 2:08PM



7 2:20PM





Left monitor displaying a software interface with a table:

Item	Description	Quantity	Unit Price	Total Price
...
...
...
...

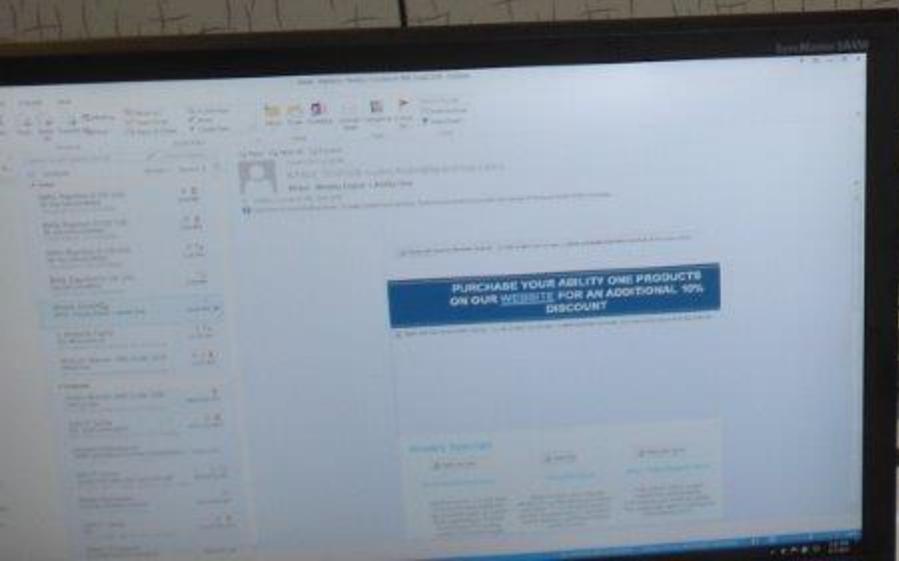
7 220PM



CHAD HARRIS
PARKING LOT

Webster's

7 2:20PM



7 2:21PM





7 2:21PM



7 2:22PM



11 11:52AM



BK 12 P. LA RM 125

FAN CONTROL

OFF HI WED

McQuay

11 12:09PM



11 12:11PM



11 12:11PM



11 12:27PM



11 12:29PM
206 F.C.U.
A



11 12:29PM

PART 6 – ATTACHMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

ATTACHMENT 5
BID PRICE SCHEDULE

PART 6 – ATTACHMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

THIS PAGE IS INTENTIONALLY LEFT BLANK

PRICE SCHEDULE

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON, D.C.

ITEM 0001

ITEM	DESCRIPTION	PRICE
0001a	Basis of Bid for Item 0001 shall be the entire work complete in accordance with the RFP specifications and drawings, but not including work indicated or specified to be provided under any of the other bid items.	
TOTAL PRICE FOR ITEM 0001		\$ _____

Notes:

- (1) Offeror shall provide a price for all items on the Price Schedule.
- (2) A firm fixed price is required for each item and no provision will be made for economic price adjustments.
- (3) The Offeror's price is valid for 90 days from the receipt of proposals.
- (4) Options will be evaluated in accordance with 52.217-5 Evaluation of Options.

Name & Address of Firm Submitting Offer:

Signature: _____

Phone: _____

Email: _____

Fax: _____

ACKNOWLEDGEMENT OF AMENDMENT(S): _____

PART 6 – ATTACHMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
FEBRUARY 20, 2015

THIS PAGE IS INTENTIONALLY LEFT BLANK

PART 6 – ATTACHMENTS

REPLACE FAN COIL UNITS, NRL B222
NAVAL RESEARCH LABORATORY, WASHINGTON D.C.

WORK ORDER NO. 1327210
APRIL 17, 2015

ATTACHMENT 6
HAZARDOUS MATERIAL REPORT
(1989)



Delivery ORDER NO.

PRIME CONTRACT:
N40080-11-D-0491

DRAFT
HAZMAT Survey
Naval Research Laboratory
Building 222
Washington, DC

PREPARED FOR:

JACOBS™

1100 N Glebe Road, Suite 500
Arlington, VA 22201

REPORT PREPARED BY:

 **Global Consulting, Inc.**

GLOBAL CONSULTING, INC
1818 NEW YORK AVENUE, NE Suite 111
WASHINGTON, DC 20002

February 13, 2015

Table of Contents

1.0	INTRODUCTION.....	1
2.0	ASBESTOS CONTAINING MAterial survey report	2
2.1	Survey Methodology	2
2.1.1	Laboratory Analyses.....	3
2.1.2	Inaccessible and Limited Access Spaces	3
2.2	Survey Results	3
2.3	Asbestos Conclusions	5
3.0	lead based paint survey report.....	7
3.1	LBP SURVEY Methodology	7
3.2	LBP Survey Results.....	8
3.3	LBP Abatement Requirements	8
4.0	Heavy metals in paint Survey.....	9
4.1	Results of heavy metals in paint testing	9
4.2	Heavy metals in paint testing conclusion.....	10
5.0	pcb wipe sampling.....	11
5.1	PCB DUST wipe Sampling results	11
5.2	PCB sampling conclusions	11

1.0 INTRODUCTION

The NAVFAC Industrial Facilities Engineering Command contracted Jacobs Engineering Group (Jacobs) to provide Architectural and Engineering Services to replace existing fan coil units in Navy Research Lab Building 222 in Washington, DC. Jacobs retained Global Consulting, Inc. (Global) to perform the environmental services associated with this project. The overall project's main focus is to replace fan coil units and mechanical equipment associated with the heat exchanges in the main Mechanical Room. This report documents the inspection and sampling of the areas and materials that may be impacted during the installation of these units. The hazardous materials assessed include Lead Based Paint (LBP), Asbestos Containing Material (ACM), heavy metals in paint, mercury containing light bulbs, polychlorinated biphenyl (PCB) light ballasts, and PCB dust. Where indicated, abatement specifications to address remediation methods will be developed. The mutual goal of the contractor and the government is to conduct a thorough inspection of potentially hazardous material with minimal disturbance to mission critical operations at the base.

Potential areas that may be impacted during the removal of the existing fan coil units were also surveyed for the presence of potential hazardous materials and the survey was conducted on January 13, 2015.

2.0 ASBESTOS CONTAINING MATERIAL SURVEY REPORT

Areas to be disturbed during removal of the existing fan coil units were surveyed for the presence of potential Asbestos Containing Materials (ACM). The results of this survey are presented in Section 2.2. These surveys were conducted by Mr. Patrick Rush, an EPA accredited Asbestos Inspector and Management Planner.

2.1 SURVEY METHODOLOGY

The ACM survey was divided into three distinct phases: pre-survey planning, survey for ACM, and development of ACM response action recommendation. The surveys conducted during this project were limited to confirming the presence of ACM that would be impacted by the renovations.

Pre-survey planning consisted of reviewing the readily available history (both construction and utilization) of the buildings, planning a survey strategy, and scheduling survey work. Jacobs provided Global with information regarding the history and planned use of the property.

Suspect ACM included the following building material categories and focused on materials likely to be impacted during renovation of the interior space and the HVAC systems:

- **Surfacing materials** - including spray-applied or troweled-on wall/ceiling coatings
- **Thermal System Insulation (TSI)** - including pipe insulation, boiler lagging, tank insulation, and duct insulation
- **Miscellaneous materials** - including ceiling tiles, floor tiles/mastic, gaskets (if accessible), fire doors, wallboard/spackle

Suspect materials that were homogeneous in nature (i.e., uniform in color and texture) were identified, touched to determine friability, and, if indicated, were sampled by removing a bulk sample. This bulk sample was placed into a labeled container and the sample location patched and repaired. One or more samples were collected from each homogeneous material if it was deemed safe to do so by the inspector. Samples were collected in a randomly distributed manner in accordance with AHERA provisions (40 CFR 763.86). The description, location, condition, and quantity of each homogeneous material were recorded in the inspector's log.

Extreme care was taken to avoid potential fiber release during the surveying and sampling process and hence a fine mist of surfactant treated water was applied to the sample location before sample collection. Samples were collected using sharpened core samplers and/or razor knives and immediately placed in labeled containers and sealed. Any debris generated was wet-wiped and immediately cleaned up.

2.1.1 Laboratory Analyses

The samples of suspect Asbestos Containing Building Materials (ACBMs) were packaged in dedicated sealable sample containers and delivered under strict chain of custody procedures for analysis to EMSL Analytical, Inc., a National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory, in Beltsville, Maryland. The samples were analyzed using polarized light microscopy/dispersion staining (PLM/DS) techniques.

Laboratory data sheets indicating the sample designations, gross descriptions, and analytical results are presented in Appendix 1.

2.1.2 Inaccessible and Limited Access Spaces

Every reasonable attempt was made to locate ACM present as TSI, surfacing material, or other miscellaneous materials in the areas surveyed. This limited survey was conducted in the loading dock, as well as mechanical areas. The buildings sampled area given in Table 1 along with the sample results. Examples of inaccessible areas might include, but are not limited to:

- Within walls and undamaged fire doors
- Enclosed pipe/duct chases
- Above solid ceilings
- Within concrete slabs
- Inside, underneath, or above mechanical equipment and ductwork
- Under materials stored in the building

2.2 Survey Results

Sample locations, description, condition, and results are given in Table 1 for the buildings surveyed under this project and are shown on the drawings presented in Appendix 2. Asbestos was found in the floor tile in the first floor corridors. This material does not cause an imminent exposure hazard. Table 1 below shows complete results of the asbestos inspections and the sampling and analysis performed as part of this project.

Miscellaneous Architectural and Engineering Services Contract
 Industrial Facilities Engineering Command
 Hazardous Material Survey Report and Abatement Specification
 NRL Building 222 NAVFAC Fan Coil Unit Replacement
 Contract No. N40080-11-D-0491

Table 1 –Asbestos Sampling Results

TABLE 1 – NRL Building 222 – Asbestos Sampling Results					
Homogeneous Area Description	Location	Quantity of positive material	Condition	Sample Numbers	Results
White dust jacket sealant on fiber glass pipe insulation	Mechanical Room	None	Good	NRL222-B/1	None detected
Black coating inside old filter tank	Mechanical Room	None	Good	NRL222-B/5	None detected
Wrap on fiber glass pipe insulation	Mechanical Room	None	Good	NRL222-B/2 NRL222-B/3 NRL222-B/4	None detected
End cap sealant on fiber glass pipe insulation	Mechanical Room	None	Good	NRL222-B/6	None detected
Gasket on silver hot water tank	Mechanical Room	None	Good	NRL222-B/7	None detected
Adhesive on foam backing to fan coil units	Mechanical Room	None	Good	NRL222-B/8	None detected
Gray 12x12 floor tile with mottled pattern	Mechanical Room	None	Good	NRL222-B/9	None detected
Mastic with above floor tile	Mechanical Room	None	Good	NRL222-B/10	None detected
White debris in back of fan coil		None	Good	NRL222-B/11	None detected

Miscellaneous Architectural and Engineering Services Contract
 Industrial Facilities Engineering Command
 Hazardous Material Survey Report and Abatement Specification
 NRL Building 222 NAVFAC Fan Coil Unit Replacement
 Contract No. N40080-11-D-0491

TABLE 1 – NRL Building 222 – Asbestos Sampling Results					
Homogeneous Area Description	Location	Quantity of positive material	Condition	Sample Numbers	Results
unit					
Wall Plaster	Throughout	None	Good	NRL222-B/12 NRL222-B/13 NRL222-B/14 NRL222-B/15 NRL222-B/16 NRL222-B/17 NRL222-B/18	None detected
Gray 9x9 floor tile with white streaks	Throughout first floor corridors	3500 square feet	Good	NRL222-B/19	12% Chrysotile
Mastic with above floor tile	Under gray 9x9	None	Good	NRL222-B/20	None detected

2.3 Asbestos Conclusions

Table 2 below shows the location and type of ACM found.

Miscellaneous Architectural and Engineering Services Contract
Industrial Facilities Engineering Command
Hazardous Material Survey Report and Abatement Specification
NRL Building 222 NAVFAC Fan Coil Unit Replacement
Contract No. N40080-11-D-0491

Table 2 –Asbestos Containing Material

TABLE 2 – NRL Building 222 – ACM Location			
Sample Number	Description	Asbestos Type	Damage
NRL222-B/19	Gray 9x9 floor tile with white streaks	12% Chrysotile	None

The asbestos containing floor tile does not pose an imminent health risk and does not need to be removed unless it will be disturbed during the HVAC renovation being undertaken by this project.

3.0 LEAD BASED PAINT SURVEY REPORT

The lead based paint survey was conducted on January 13, 2015. This survey was conducted by Mr. Don Wanigasundara and oversaw by Indika Jayatilake and the results are presented in Section 3.2.

3.1 LBP SURVEY METHODOLOGY

Global's certified lead inspector technician Mr. Don Wanigasundara performed the lead-based paint (LBP) inspection in order to characterize interior and exterior painted surfaces for lead content. The testing for lead content in paints was performed using a NITON XLp X-Ray Fluorescence (XRF) Spectrum Analyzer (Serial Number 18595). Prior to the XRF analysis, the instrument was calibrated against reference standards of known lead concentrations. Tested building materials included doors, door frames, windows, window frames, window sills, walls, ceilings, stairs, pipes, steel support columns, and other miscellaneous painted surfaces that were screened for LBP.

The XRF detects lead in the field by reading fluorescence emanating from a painted surface when exposed to small amounts of radiation. LBP, when tested via XRF, is defined by the U.S Department of Housing and Urban Development (HUD) and the District of Columbia Department of the Environment (DDOE) as paint having lead concentrations greater than one milligram per square centimeter (1.0 mg/cm²).

Prior to testing, the composition of the building component substrate (e.g., wood, metal, etc.) was determined by the lead inspector, and subsequently logged into the XRF analyzer. The NITON XLp automatically performs a substrate correction to ensure that this factor did not result in false negative readings.

At days end, a calibration re-check is performed to ensure that the instrument has maintained accuracy and precision during the measurement period. The instrument is also calibrated each time it is turned off, or on, and typically at four (4) hour intervals during the workday for the same reasons. The use of the XRF was in general accordance with the Performance Characteristic Sheet (PCS) methodology for the specific instrument. XRF instrument calibration checks were performed according to the PCS.

The NITON XLp XRF data was downloaded directly to a computer to generate a report detailing the date/time, materials sampled, location, substrate and lead content.

During the XRF survey, the four sides of the building were denoted by the letters A, B, C, and D. Side A is the building entry door side. Sides B, C, and D are identified clockwise from Side A as one faces side A from the interior of the building.

- Side A = the street side for building address, and the side of each interior room that is on the front side of the building. In the case of B215, side A is the eastern facing side of the building.

- Side B = All walls located to the right of Side A of the building.
- Side C = Rear side of the building and the side of each interior room that is on the rear side of the building across from Side A.
- Side D = All walls located to the left of Side A.

All the painted surfaces of the building were visually examined to determine current condition. Surfaces that are intact or in fair condition (as defined by HUD Guidelines) do not pose an immediate health risk, regardless of the lead content. However, these surfaces should be monitored and repaired as necessary. LBP in poor condition is a priority lead-hazard and should be promptly addressed using approved Lead Safe Work Practices.

3.2 LBP SURVEY RESULTS

A total of 46 surfaces were tested for LBP using the XRF. None of the components were found to exceed the DC standard of 1.0 mg/cm². Complete results of XRF analysis can be found in Appendix 3 – XRF Survey Data.

Painted surfaces identified as being covered with paint containing lead or materials containing lead in any concentration must be handled in accordance with 29 CFR 1926.62, the OSHA Lead Exposure in Construction Standard. Global recommends notifying contractors of all known lead-containing paints prior to their bidding on work at the Facility that may disturb these painted surfaces. Contractor activities that result in disturbance of the lead-containing paint (i.e. via sanding, scraping, cutting, grinding, welding, drilling, or other activities potentially generating airborne lead dust) must comply with the requirements contained within the District of Columbia's Lead-Hazard Prevention and Elimination Act of 2008 and the U.S. EPA's Renovation, Repair and Painting Rule including training and the use of lead-safe work practices. In addition, the waste produced from the disturbance of the lead-containing paint should be properly characterized and disposed of according to applicable local, state, and federal regulations.

3.3 LBP ABATEMENT REQUIREMENTS

The limited survey results show that no lead paint abatement is necessary.

4.0 HEAVY METALS IN PAINT SURVEY

Paint surfaces were tested for the presence of cadmium, chromium and lead. This survey was conducted by Mr. Patrick Rush on January 13, 2015. Results of the survey are presented in Section 4.1.

Bulk samples of suspected hazardous paint were collected by scraping them off of their respective component and placed into individually label containers. Samples were sent to EMSL Laboratory in Cinnaminson, New Jersey and subjected to EPA analysis method 6010C for lead, cadmium, and chromium. These three metals are part of the Resource Conservation and Recovery Act (RCRA) metals. These metals are monitored under RCRA because they are known to exhibit characteristics of corrosiveness, toxicity, ignitability, or reactivity.

4.1 RESULTS OF HEAVY METALS IN PAINT TESTING

Table 3 below show the results of heavy metals in paint sampling and analysis.

TABLE 3 – NRL Building 222 – Heavy Metal Locations					
Component	Color	Sample Number	Lead (mg/kg)	Chromium (mg/kg)	Cadmium (mg/kg)
Metal filter tank in mechanical room	Green	NRL222-L/1	990	33	8.7
Metal electrical conduit in mechanical room	Green	NRL222-L/2	880	6.7	1.3
Metal water tanks in mechanical room	Yellow	NRL222-L/3	810	7.0	150
Metal water tanks in mechanical room	Red	NRL222-L/4	230	1000	18
Metal hot water tanks in mechanical room	Silver	NRL222-L/5	2800	530	11
Metal ceiling deck in mechanical room	White	NRL222-L/6	39	9.9	9.8

4.2 HEAVY METALS IN PAINT TESTING CONCLUSION

A limited survey was conducted for the presence of lead, chromium and cadmium in paint in the areas likely to be impacted by the current HVAC renovation. The limited heavy metal investigation did identify elevated levels of the above referenced heavy metals on the metal water tanks in the mechanical room. The paint on the metal substrate appears to be in good condition. It does not appear that this equipment will be impacted by the current renovation activities planned during this phase of the renovation. In the event this equipment is scheduled for removal it is recommended that it be packaged and removed as a component and disposed of as scrap metal. The disposal facility should be notified that the paint on these components may have elevated levels of heavy metals in the paint.

5.0 PCB WIPE SAMPLING

Global collected wipe samples for polychlorinated biphenyl (PCB) dust. Building 222 does not currently house wet transformers that could be cooled with PCB containing; therefore one confirmatory wipe was collected from the mechanical room.

Wipe samples were collected in accordance with EPA methodology. Once collected samples were submitted to ALS Environmental in Middletown, Pennsylvania and submitted to EPA analysis method 8082A. Results are detailed below.

5.1 PCB DUST WIPE SAMPLING RESULTS

Table 4 below shows results of PCB dust wipe sampling.

TABLE 4 – NRL Building 30 – PCB Dust Wipe Sampling Results			
Location	Sample Number	Parameter	Result ($\mu\text{g}/100 \text{ cm}^2$)
Mechanical Room Floor	NRL30-P/1	PCB-1016	ND
		PCB-1221	ND
		PCB-1232	ND
		PCB-1242	ND
		PCB-1248	ND
		PCB-1254	1.0
		PCB-1260	ND
		PCB-1016	ND

5.2 PCB SAMPLING CONCLUSIONS

The EPA sets an action level for PCBs of 50 part per million ($\mu\text{g}/100 \text{ cm}^2$). All samples collected were below this level.

Miscellaneous Architectural and Engineering Services Contract
Industrial Facilities Engineering Command
Hazardous Material Survey Report and Abatement Specification
NRL Building 222 NAVFAC Fan Coil Unit Replacement
Contract No. N40080-11-D-0491

APPENDIX 1 – LABORATORY DATA



EMSL Analytical, Inc.

200 Route 130 North, Cinnaminson, NJ 08077

Phone: (856) 303-2500 Fax: (856) 858-4571 Email: EnvChemistry2@emsl.com

Attn:

**Patrick Rush
Global Consulting, Inc.
1818 New York Avenue N.E.
Suite 107
Washington, DC 20002**

2/4/2015

Phone: (202) 832-1433

Fax: (202) 832-1434

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 1/23/2015. The results are tabulated on the attached data pages for the following client designated project:

U0341/WRL Bldg 222

The reference number for these samples is EMSL Order #011500328. Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact me at (856) 303-2500.

Reviewed and Approved By:

Julie Smith - Laboratory Director



The test results contained within this report meet the requirements of NELAP and/or the specific certification program that is applicable, unless otherwise noted.

NELAP Certifications: NJ 03036, NY 10872, PA 68-00367

The samples associated with this report were received in good condition unless otherwise noted. This report relates only to those items tested as received by the laboratory. The QC data associated with the sample results meet the recovery and precision requirements established by the NELAP, unless specifically indicated. All results for soil samples are reported on a dry weight basis, unless otherwise noted. This report may not be reproduced except in full and without written approval by EMSL Analytical, Inc.



EMSL Analytical, Inc.

200 Route 130 North, Cinnaminson, NJ 08077

Phone/Fax: (856) 303-2500 / (856) 858-4571

<http://www.EMSL.com>

EnvChemistry2@emsl.com

EMSL Order: 011500328

CustomerID: GLOC62

CustomerPO:

ProjectID:

Attn: **Patrick Rush**
Global Consulting, Inc.
1818 New York Avenue N.E.
Suite 107
Washington, DC 20002

Phone: (202) 832-1433
Fax: (202) 832-1434
Received: 01/23/15 9:45 AM

Project: U0341/WRL Bldg 222

Analytical Results

Client Sample Description NRL222-L/1 **Collected:** 1/13/2015 **Lab ID:** 0001

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
3050B/6010C	Cadmium	8.7	0.98	mg/Kg	1/30/2015	JS	1/30/2015	BE
3050B/6010C	Chromium	33	4.9	mg/Kg	1/30/2015	JS	1/30/2015	BE
3050B/6010C	Lead	990	24	mg/Kg	1/30/2015	JS	2/2/2015	BE

Client Sample Description NRL222-L/2 **Collected:** 1/13/2015 **Lab ID:** 0002

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
3050B/6010C	Cadmium	150	1.3	mg/Kg	1/30/2015	JS	1/30/2015	BE
3050B/6010C	Chromium	7.0	6.7	mg/Kg	1/30/2015	JS	1/30/2015	BE
3050B/6010C	Lead	880	33	mg/Kg	1/30/2015	JS	2/2/2015	BE

Client Sample Description NRL222-L/3 **Collected:** 1/13/2015 **Lab ID:** 0003

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
3050B/6010C	Cadmium	44	4.8	mg/Kg	1/30/2015	JS	2/2/2015	BE
3050B/6010C	Chromium	11000	240	mg/Kg	1/30/2015	JS	2/2/2015	BE
3050B/6010C	Lead	810	24	mg/Kg	1/30/2015	JS	2/2/2015	BE

Client Sample Description NRL222-L/4 **Collected:** 1/13/2015 **Lab ID:** 0004

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
3050B/6010C	Cadmium	18	4.8	mg/Kg	1/30/2015	JS	2/2/2015	BE
3050B/6010C	Chromium	1000	24	mg/Kg	1/30/2015	JS	2/2/2015	BE
3050B/6010C	Lead	230	24	mg/Kg	1/30/2015	JS	2/2/2015	BE

Client Sample Description NRL222-L/5 **Collected:** 1/13/2015 **Lab ID:** 0005

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
3050B/6010C	Cadmium	11	0.95	mg/Kg	1/30/2015	JS	1/31/2015	BE
3050B/6010C	Chromium	530	48	mg/Kg	1/30/2015	JS	2/2/2015	BE
3050B/6010C	Lead	2800	48	mg/Kg	1/30/2015	JS	2/2/2015	BE

Client Sample Description NRL222-L/6 **Collected:** 1/13/2015 **Lab ID:** 0006

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
3050B/6010C	Cadmium	9.8	0.98	mg/Kg	1/30/2015	JS	1/30/2015	BE

**EMSL Analytical, Inc.**

200 Route 130 North, Cinnaminson, NJ 08077

Phone/Fax: (856) 303-2500 / (856) 858-4571

<http://www.EMSL.com>EnvChemistry2@emsl.com

EMSL Order: 011500328

CustomerID: GLOC62

CustomerPO:

ProjectID:

Attn: **Patrick Rush**
Global Consulting, Inc.
1818 New York Avenue N.E.
Suite 107
Washington, DC 20002

Phone: (202) 832-1433
 Fax: (202) 832-1434
 Received: 01/23/15 9:45 AM

Project: U0341/WRL Bldg 222

Analytical Results*Client Sample Description* NRL222-L/6*Collected:* 1/13/2015 *Lab ID:* 0006

<i>Method</i>	<i>Parameter</i>	<i>Result</i>	<i>RL</i>	<i>Units</i>	<i>Prep Date</i>	<i>Analyst</i>	<i>Analysis Date</i>	<i>Analyst</i>
3050B/6010C	Chromium	9.9	4.9	mg/Kg	1/30/2015	JS	1/30/2015	BE
3050B/6010C	Lead	39	4.9	mg/Kg	1/30/2015	JS	1/30/2015	BE

Definitions:

ND - indicates that the analyte was not detected at the reporting limit

RL - Reporting Limit



EMSL Analytical, Inc.

10768 Baltimore Avenue, Beltsville, MD 20705

Phone/Fax: (301) 937-5700 / (301) 937-5701

<http://www.EMSL.com>

beltsvillelab@emsl.com

EMSL Order:	191500774
CustomerID:	GLOC62
CustomerPO:	
ProjectID:	

Attn: **Patrick Rush**
Global Consulting, Inc.
1818 New York Avenue N.E.
Suite 107
Washington, DC 20002

Phone: (202) 832-1433
 Fax: (202) 832-1434
 Received: 01/22/15 9:15 AM
 Analysis Date: 1/23/2015
 Collected: 1/22/2015

Project: U034/NRL BLDG 222

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
NRL 222-B/1 191500774-0001	WHT DUST JACKET SEALANT ON FIBERGLASS PI	Tan/White/Silver	5%	Cellulose	85% Non-fibrous (other) None Detected
		Fibrous Heterogeneous	10%	Glass	
NRL 222-B/5 191500774-0002	BLK COATING INSIDE OLD FILTER TANK	Black Non-Fibrous Homogeneous			100% Non-fibrous (other) None Detected
NRL 222-B/2 191500774-0003	WRAP ON FIBERGLASS PI	White/Silver/Yello	30%	Glass	58% Non-fibrous (other) None Detected
		w Fibrous Heterogeneous	12%	Cellulose	
NRL 222-B/3 191500774-0004	WRAP ON FIBERGLASS PI	White/Silver/Yello	15%	Cellulose	35% Non-fibrous (other) None Detected
		w Fibrous Heterogeneous	50%	Glass	
NRL 222-B/4 191500774-0005	WRAP ON FIBERGLASS PI	White/Silver/Yello	10%	Cellulose	55% Non-fibrous (other) None Detected
		w Fibrous Heterogeneous	35%	Glass	
NRL 222-B/6 191500774-0006	END CAP SEALANT	White/Silver/Yello	40%	Glass	55% Non-fibrous (other) None Detected
		w Non-Fibrous Homogeneous	5%	Cellulose	
NRL 222-B/7 191500774-0007	GASKET ON SILVER HOT H2O TANK	Brown/Red/Green	8%	Cellulose	12% Ca Carbonate 80% Non-fibrous (other) None Detected
		Non-Fibrous Homogeneous			

Analyst(s)
 Luba Stockert (20)


 Joe Centifonti, Laboratory Manager
 or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%
 Samples analyzed by EMSL Analytical, Inc. Beltsville, MD NVLAP Lab Code 200293-0

Initial report from 01/23/2015 10:33:07

**EMSL Analytical, Inc.**

10768 Baltimore Avenue, Beltsville, MD 20705

Phone/Fax: (301) 937-5700 / (301) 937-5701

<http://www.EMSL.com>beltsvillelab@emsl.com

EMSL Order:	191500774
CustomerID:	GLOC62
CustomerPO:	
ProjectID:	

Attn: **Patrick Rush**
Global Consulting, Inc.
1818 New York Avenue N.E.
Suite 107
Washington, DC 20002

Phone: (202) 832-1433
 Fax: (202) 832-1434
 Received: 01/22/15 9:15 AM
 Analysis Date: 1/23/2015
 Collected: 1/22/2015

Project: **U034/NRL BLDG 222**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
NRL 222-B/8 191500774-0008	ADHESIVE FOR BACKING ON FOIL COIL UNITS	Brown Non-Fibrous Homogeneous	3% Synthetic	97% Non-fibrous (other)	None Detected
NRL 222-B/9 191500774-0009	GRAY 12X12 FT W/ MOTTLED PATTERN	Gray Non-Fibrous Homogeneous		60% Ca Carbonate 40% Non-fibrous (other)	None Detected
NRL 222-B/10 191500774-0010	MSTC W/ GRAY 12X12 FT	Yellow Non-Fibrous Homogeneous	3% Cellulose	97% Non-fibrous (other)	None Detected
NRL 222-B/11 191500774-0011	WHT DEBRIS IN FOIL COIL UNITS	Gray Non-Fibrous Homogeneous	5% Cellulose 3% Synthetic	45% Quartz 47% Non-fibrous (other)	None Detected
NRL 222-B/12 191500774-0012	WALL PLSTR	White Non-Fibrous Homogeneous	2% Cellulose	15% Perlite 83% Non-fibrous (other)	None Detected
One Coat Plaster					
NRL 222-B/13 191500774-0013	WALL PLSTR	White Non-Fibrous Homogeneous	3% Cellulose	20% Perlite 77% Non-fibrous (other)	None Detected
One Coat Plaster					
NRL 222-B/14 191500774-0014	WALL PLSTR	White Non-Fibrous Homogeneous		20% Perlite 80% Non-fibrous (other)	None Detected
One Coat Plaster					
NRL 222-B/15 191500774-0015	WALL PLSTR	White Non-Fibrous Homogeneous	2% Cellulose	20% Perlite 78% Non-fibrous (other)	None Detected
One Coat Plaster					

Analyst(s)
 Luba Stockert (20)


 Joe Centifonti, Laboratory Manager
 or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%
 Samples analyzed by EMSL Analytical, Inc. Beltsville, MD NVLAP Lab Code 200293-0

Initial report from 01/23/2015 10:33:07

**EMSL Analytical, Inc.**

10768 Baltimore Avenue, Beltsville, MD 20705

Phone/Fax: (301) 937-5700 / (301) 937-5701

<http://www.EMSL.com>beltsvillelab@emsl.com

EMSL Order:	191500774
CustomerID:	GLOC62
CustomerPO:	
ProjectID:	

Attn: **Patrick Rush**
Global Consulting, Inc.
1818 New York Avenue N.E.
Suite 107
Washington, DC 20002

Phone: (202) 832-1433
 Fax: (202) 832-1434
 Received: 01/22/15 9:15 AM
 Analysis Date: 1/23/2015
 Collected: 1/22/2015

Project: U034/NRL BLDG 222

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
NRL 222-B/16 <i>191500774-0016</i>	WALL PLSTR	Tan/White Non-Fibrous Homogeneous	3% Cellulose	2% Quartz 15% Perlite 80% Non-fibrous (other)	None Detected
One Coat Plaster					
NRL 222-B/17 <i>191500774-0017</i>	WALL PLSTR	White Non-Fibrous Homogeneous	2% Cellulose	5% Quartz 20% Perlite 73% Non-fibrous (other)	None Detected
Some crushed Rough Coat present. Composite Skim and Rough Coats.					
NRL 222-B/18 <i>191500774-0018</i>	WALL PLSTR	Tan/White Non-Fibrous Homogeneous	3% Cellulose	20% Quartz 15% Perlite 62% Non-fibrous (other)	None Detected
Some crushed Rough Coat present. Composite Skim and Rough Coats.					
NRL 222-B/19 <i>191500774-0019</i>	GRAY 9X9 FT W/ WHT STREAKS	Gray Non-Fibrous Homogeneous		60% Ca Carbonate 28% Non-fibrous (other)	12% Chrysotile
NRL 222-B/20 <i>191500774-0020</i>	MSTC W/ ABOVE	Brown Non-Fibrous Homogeneous	6% Cellulose	94% Non-fibrous (other)	None Detected

Analyst(s)

 Luba Stockert (20)


 Joe Centifonti, Laboratory Manager
 or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%
 Samples analyzed by EMSL Analytical, Inc. Beltsville, MD NVLAP Lab Code 200293-0

Initial report from 01/23/2015 10:33:07

January 28, 2015

Mr. Carl Kohlmeyer
Global Consulting
1818 New York Ave NE
Washington, DC 20002

Certificate of Analysis

Project Name: Various Testing	Workorder: 2051198
Purchase Order:	Workorder ID: U0341/NRL Bldg 222

Dear Mr. Kohlmeyer:

Enclosed are the analytical results for samples received by the laboratory on Friday, January 23, 2015.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Debra J. Musser (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Patrick Rush

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.



Ms. Debra J. Musser
Project Coordinator

ALS Environmental Laboratory Locations Across North America

Canada: Burlington · Calgary · Centre of Excellence · Edmonton · Fort McMurray · Fort St. John · Grande Prairie · London · Mississauga · Richmond Hill · Saskatoon · Thunder Bay
Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

SAMPLE SUMMARY

Workorder: 2051198 U0341/NRL Bldg 222

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2051198001	NRL222-P/1	Wipe	1/16/2015 10:50	1/23/2015 22:20	Mr. Patrick Rush

Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit

ALS Environmental Laboratory Locations Across North America

Canada: Burlington · Calgary · Centre of Excellence · Edmonton · Fort McMurray · Fort St. John · Grande Prairie · London · Mississauga · Richmond Hill · Saskatoon · Thunder Bay
Vancouver Waterloo · Winnipeg · Yellowknife **United States:** Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York **Mexico:** Monterrey

ANALYTICAL RESULTS

Workorder: 2051198 U0341/NRL Bldg 222

Lab ID: **2051198001**

Date Collected: 1/16/2015 10:50

Matrix: Wipe

Sample ID: **NRL222-P/1**

Date Received: 1/23/2015 22:20

Parameters	Results	Flag	Units	RDL	Method	Prepared By	Analyzed	By	Cntr
PCBs									
Total Polychlorinated Biphenyl			ug/Wipe	0.50	SW846 8082A	1/26/15 KAC	1/26/15 21:33	EGO	A
Aroclor-1016	ND		ug/Wipe	0.50	SW846 8082A	1/26/15 KAC	1/26/15 21:33	EGO	A
Aroclor-1221	ND		ug/Wipe	0.50	SW846 8082A	1/26/15 KAC	1/26/15 21:33	EGO	A
Aroclor-1232	ND		ug/Wipe	0.50	SW846 8082A	1/26/15 KAC	1/26/15 21:33	EGO	A
Aroclor-1242	ND		ug/Wipe	0.50	SW846 8082A	1/26/15 KAC	1/26/15 21:33	EGO	A
Aroclor-1248	ND		ug/Wipe	0.50	SW846 8082A	1/26/15 KAC	1/26/15 21:33	EGO	A
Aroclor-1254	1.0		ug/Wipe	0.50	SW846 8082A	1/26/15 KAC	1/26/15 21:33	EGO	A
Aroclor-1260	ND		ug/Wipe	0.50	SW846 8082A	1/26/15 KAC	1/26/15 21:33	EGO	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
Decachlorobiphenyl (S)	72.1		%	30 - 150	SW846 8082A	1/26/15 KAC	1/26/15 21:33	EGO	A
Tetrachloro-m-xylene (S)	67.8		%	30 - 150	SW846 8082A	1/26/15 KAC	1/26/15 21:33	EGO	A



Ms. Debra J. Musser
Project Coordinator

ALS Environmental Laboratory Locations Across North America

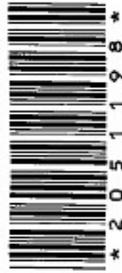
Canada: Burlington · Calgary · Centre of Excellence · Edmonton · Fort McMurray · Fort St. John · Grande Prairie · London · Mississauga · Richmond Hill · Saskatoon · Thunder Bay
Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey



34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

**CHAIN OF CUSTODY/
REQUEST FOR ANALYSIS**
ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT /
SAMPLER. INSTRUCTIONS ON THE BACK.

Page of
Courier:
Tracking #:



* 2 0 5 1 1 9 8 *

Co. Name: Global Consulting, Inc.
Contact (Report to): PATRICK RUSH Phone: 705-851-8304
Address: 1819 New York Ave. #14, NE
Washington DC, 20002

Bill to (if different than Report to): same PO#:
Project Name#: EVO 341 / NRL Bldg 222 ALS Quote #:
TAT: Normal-Standard TAT is 10-12 business days. Date Required:
 Rush-Subject to ALS approval and surcharges. Approved By:

Email? prush@gcusa.biz
Fax? No.

Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time
1 <u>NRL 222 - P/1</u>		<u>1/16</u>	<u>1050</u>
2			
3			
4			
5			
6			
7			
8			

SAMPLED BY (Please Print): PATRICK RUSH

Project Comments:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
<u> </u>	<u>1/23</u>	<u>2220</u>	<u>JEROME WILLIAMS LYS</u>	<u>1/23</u>	<u>1403</u>
<u> </u>	<u>1/23</u>	<u>2220</u>	<u>HALLMAN</u>	<u>1/23</u>	<u>2230</u>
<u> </u>			<u> </u>		
<u> </u>			<u> </u>		
<u> </u>			<u> </u>		
<u> </u>			<u> </u>		

Container Type
Container Size
Preservative
No. of Coolers:
Therm. ID: 291
Cooler Temp:
Notes:

ANALYSES/METHOD REQUESTED

Enter Number of Containers Per Analysis	Correct containers?	Correct sample volume?	Received on ice?	COC Labels complete/accurate?	Container in good condition?
<u>8082</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>
<u>222</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>
<u> </u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>
<u> </u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>
<u> </u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>
<u> </u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>
<u> </u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>
<u> </u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>
<u> </u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>

ALS FIELD SERVICES
 Pickup
 Labor
 Composite Sampling
 Rental Equipment
 Other:

SDWA Forms? Standard CLP-like NJ-Reduced NJ-Full Low
 If yes, format type:

State Samples Collected In? MD NJ NY PA

EDS Required?

DOO Criteria Required?



Miscellaneous Architectural and Engineering Services Contract
Industrial Facilities Engineering Command
Hazardous Material Survey Report and Abatement Specification
NRL Building 222 NAVFAC Fan Coil Unit Replacement
Contract No. N40080-11-D-0491

APPENDIX 2 – HAZMAT LOCATION DRAWING



NAVAC
NAVAL RESEARCH
LABORATORY

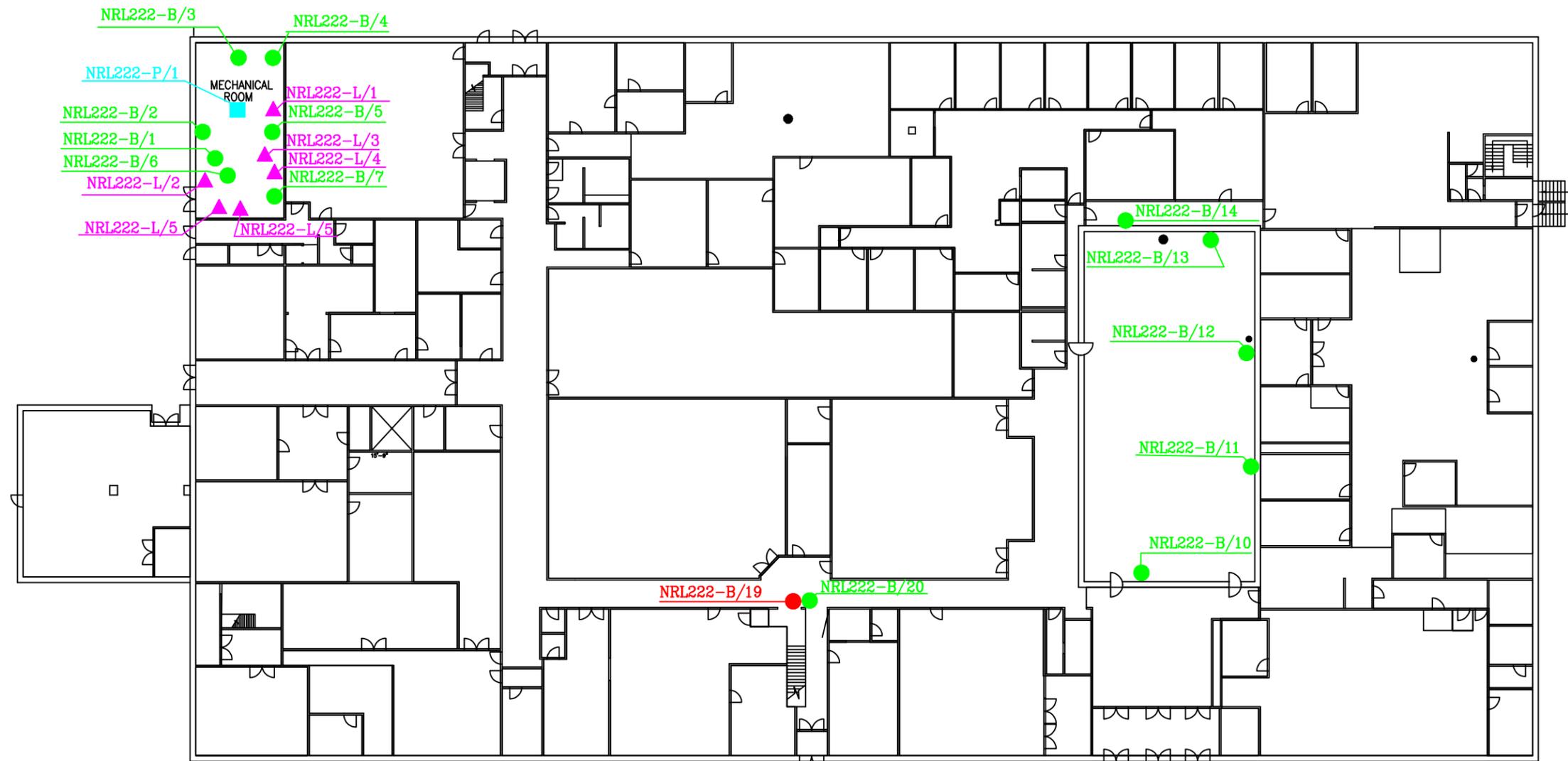
HAZARDOUS
MATERIALS
SURVEY

for
JACOBS ENGINEERING
GROUP INC.

Contract No.
N40080-11-D-0491

NOTE:

BUILDING 222
HAZARDOUS MATERIALS
SURVEY & ENVIRONMENTAL
SUPPORT SERVICES



LEGEND

- NRL30-B/# NEGATIVE ASBESTOS SAMPLE LOCATIONS
- NRL30-B/# POSITIVE ASBESTOS SAMPLE LOCATIONS
- ▲ NRL30-L/# PAINT CHIP SAMPLE LOCATIONS
- NRL30-P/# PCB WIPE SAMPLE LOCATIONS

BUILDING 222 - FIRST FLOOR PLAN



GLOBAL CONSULTING, INC.
1818 NEW YORK AVE. SUITE 111
WASHINGTON, DC 20002
Telephone 202-832-1433
Fax 202-832-1434

Drawing Title	
HAZMAT SURVEY BUILDING 222	
File Name	Scale
First Floor	1/32"=1'
Date	Project Number
02-13-2015	U0341
Drawn By	
TVV	
Checked By	
PAR	



NAVFAC
NAVAL RESEARCH
LABORATORY

HAZARDOUS
MATERIALS
SURVEY
for
JACOBS ENGINEERING
GROUP INC.
Contract No.
N40080-11-D-0491

NOTE:
BUILDING 222
HAZARDOUS MATERIALS
SURVEY & ENVIRONMENTAL
SUPPORT SERVICES



GLOBAL CONSULTING, INC.
1818 NEW YORK AVE. SUITE 111
WASHINGTON, DC 20002
Telephone 202-832-1433
Fax 202-832-1434

Drawing Title	
HAZMAT SURVEY BUILDING 222	
File Name	Scale
Second Floor	1/32"=1'
Date	Project Number
02-13-2015	U0341
Drawn By	
TVV	
Checked By	
PAR	

SHEET 2 OF 2

LEGEND

-  **NRL222-B/#** NEGATIVE ASBESTOS SAMPLE LOCATIONS
-  **NRL222-B/#** POSITIVE ASBESTOS SAMPLE LOCATIONS
-  **NRL222-L/#** PAINT CHIP SAMPLE LOCATIONS
-  **NRL222-P/#** PCB WIPE SAMPLE LOCATIONS

BUILDING 222 - SECOND FLOOR PLAN

Miscellaneous Architectural and Engineering Services Contract
Industrial Facilities Engineering Command
Hazardous Material Survey Report and Abatement Specification
NRL Building 222 NAVFAC Fan Coil Unit Replacement
Contract No. N40080-11-D-0491

APPENDIX 3 – LBP DATA

Miscellaneous Architectural and Engineering Services Contract
Industrial Facilities Engineering Command
Hazardous Material Survey Report and Abatement Specification
NRL Building 222 NAVFAC Fan Coil Unit Replacement
Contract No. N40080-11-D-0491

Component	Substrate	Side	Condition	Color	Building	Floor	Room	Result	% Pb
		CALIBRATE			NRL BLD 222	FIRST	MECHNICAL ROOM	Positive	1.1
		CALIBRATE			NRL BLD 222	FIRST	MECHNICAL ROOM	Positive	1
		CALIBRATE			NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	0.9
DOOR	METAL	A	DETERIORATED	GREY	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
DOOR	METAL	A	DETERIORATED	GREY	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
WALL	CONCRETE BLOCK	A	DETERIORATED	LT BLUE	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
WALL	CONCRETE BLOCK	A	DETERIORATED	LT BLUE	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
WALL	CONCRETE BLOCK	B	DETERIORATED	LT BLUE	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
WALL	CONCRETE BLOCK	C	DETERIORATED	LT BLUE	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
WALL	CONCRETE BLOCK	D	DETERIORATED	LT BLUE	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
FAN	METAL	A	INTACT	RED	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
FAN	METAL	A	INTACT	RED	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
BOILER	METAL	A	DETERIORATED	LT GREEN	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
BOILER	METAL	A	DETERIORATED	LT GREEN	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD

Miscellaneous Architectural and Engineering Services Contract
Industrial Facilities Engineering Command
Hazardous Material Survey Report and Abatement Specification
NRL Building 222 NAVFAC Fan Coil Unit Replacement
Contract No. N40080-11-D-0491

PIPE	METAL	A	INTACT	LT GREEN	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
PIPE	METAL	A	INTACT	LT GREEN	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
SMALL WATER TANK	METAL	A	PEELING	LT GREEN	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
SMALL WATER TANK	METAL	A	PEELING	LT GREEN	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
WAER TANK	METAL	A	PEELING	SILVER	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
WAER TANK	METAL	A	PEELING	SILVER	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
WAER TANK	METAL	A	PEELING	SILVER	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
FIREPLACE TRIM	METAL	A	PEELING	SILVER	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
FIREPLACE TRIM	METAL	A	PEELING	SILVER	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
WALL	CONCRETE BLOCK	D	INTACT	LT GREEN	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
WALL	CONCRETE BLOCK	D	INTACT	LT GREEN	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
OUT SIDE PIPE	METAL	D	INTACT	GREY	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
OUT SIDE PIPE	METAL	D	INTACT	GREY	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
OUT SIDE PIPE	METAL	D	INTACT	GREY	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
OUT SIDE PIPE	METAL	D	INTACT	GREY	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD

Miscellaneous Architectural and Engineering Services Contract
 Industrial Facilities Engineering Command
 Hazardous Material Survey Report and Abatement Specification
 NRL Building 222 NAVFAC Fan Coil Unit Replacement
 Contract No. N40080-11-D-0491

WALL	METAL	A	INTACT	LT GREEN	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
WALL	METAL	A	INTACT	LT GREEN	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
WALL	METAL	A	INTACT	LT GREEN	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
WALL	METAL	A	INTACT	LT GREEN	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
CEILING	METAL	A	INTACT	OFF WHITE	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
CEILING	METAL	A	INTACT	OFF WHITE	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
CEILING	METAL	A	INTACT	OFF WHITE	NRL BLD 222	FIRST	MECHNICAL ROOM	Negative	< LOD
HEATING UNIT	METAL	A	INTACT	OFF WHITE	NRL BLD 222	SECOND	MECHNICAL ROOM	Negative	< LOD
HEATING UNIT	METAL	A	INTACT	OFF WHITE	NRL BLD 222	SECOND	MECHNICAL ROOM	Negative	< LOD
HEATING UNIT	METAL	B	INTACT	BROWN	NRL BLD 222	SECOND	MECHNICAL ROOM	Negative	< LOD
HEATING UNIT	METAL	B	INTACT	BROWN	NRL BLD 222	SECOND	MECHNICAL ROOM	Negative	< LOD
HEATING UNIT	METAL	C	INTACT	WHITE	NRL BLD 222	SECOND	MECHNICAL ROOM	Negative	< LOD
HEATING UNIT	METAL	C	INTACT	WHITE	NRL BLD 222	SECOND	MECHNICAL ROOM	Negative	< LOD
HEATING UNIT	METAL	C	INTACT	BLACK	NRL BLD 222	SECOND	FIFST FL	Negative	< LOD
HEATING UNIT	METAL	C	INTACT	BLACK	NRL BLD 222	SECOND	FIFST FL	Negative	< LOD

Miscellaneous Architectural and Engineering Services Contract
 Industrial Facilities Engineering Command
 Hazardous Material Survey Report and Abatement Specification
 NRL Building 222 NAVFAC Fan Coil Unit Replacement
 Contract No. N40080-11-D-0491

HEATING UNIT	METAL	C	INTACT	BLACK	NRL BLD 222	SECOND	FIFST FL	Negative	< LOD
HEATING UNIT	METAL	B	INTACT	BLACK	NRL BLD 222	SECOND	FIFST FL	Negative	< LOD
HEATING UNIT	METAL	B	INTACT	BLACK	NRL BLD 222	SECOND	FIFST FL	Negative	< LOD
HEATING UNIT	METAL	D	INTACT	BLACK	NRL BLD 222	SECOND	FIFST FL	Negative	< LOD
HEATING UNIT	METAL	D	INTACT	BLACK	NRL BLD 222	SECOND	FIFST FL	Negative	< LOD
HEATING UNIT	METAL	D	INTACT	BLACK	NRL BLD 222	SECOND	FIFST FL	Negative	< LOD
		CALIBRATE		BLACK	NRL BLD 222	SECOND	FIFST FL	Negative	0.9
		CALIBRATE		BLACK	NRL BLD 222	SECOND	FIFST FL	Negative	0.9
		CALIBRATE		BLACK	NRL BLD 222	SECOND	FIFST FL	Negative	0.9
		CALIBRATE		BLACK	NRL BLD 222	SECOND	FIFST FL	Negative	0.9