Scope of Work
Steam Distribution - System Study
Rev. 25 Nov 1985

I. STUDY OBJECTIVE

The prime objective of this study is to identify and quantify the central and building steam distribution system and steam condensate return system energy losses and to make and support recommendations of corrective measures and capital improvements which will result in energy and monetary savings to the Government.

The survey shall separately be conducted at the following installations:

1. Marine Corps Base, Camp Lejeune, North Carolina.

2. Marine Corps Air Station, Cherry Point, North Carolina (includes Naval Air Rework Facility, Cherry Point).

II. SURVEY SECTION

A. Central Steam and Condensate Return Distribution System (CSDS)

CSDS for the purpose of this study is defined as all length of the steam distribution system and steam condensate return system from a point where they leave the central plant or plants to the point where they enter the building served. The Analysis and Survey will consist of the following:

1. See Item C, Steam Trap Survey.

B. Building Steam Distribution System and Steam Condensate Return System (BSDS)

BSDS is defined as all lengths of the steam distribution system and steam condensate return system within the building. The analysis and survey will consist of five work components:

1. Inspect, identify and list the physical condition of the BSDS and its components that directly contribute to energy losses such as but not limited to pipe sizes and lengths, expansion joints, valves, heat exchangers, ndoned piping and am leaks.

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1. Inspect, identify and list the physical condition of the BSDS and its components that directly contribute to energy losses such as but not limited to pipe sizes and lengths, expansion joints, valves, heat exchangers, missing insulation, insulation type and thickness, abandoned piping and condensate return system and components. Identify steam leaks.

2. Prepare 8-1/2" X 11" diagrammatic sketches (not necessarily to scale). Each diagrammatic sketch shall include information on the pipe size, insulation type and size, estimated length of sized pipe, show all valves, show all steam trap locations and identification numbers, show major steam using components, and include the connection to the CSDS.

3. Evaluate building steam energy use for energy effective improvements, modifications, and/or alterations including control improvements, night setback, connecting to existing EMCS, etc. The above sketches are to be used in support of the evaluation analyses. The projects developed must conform to the current MILCON, ECIP, or special project criteria as provided by the Navy.

4. Perform an annual summation of heat losses of the BSDS quantified and listed by an acceptable engineering method. Heat losses shall be classified as normal or abnormal.

5. Evaluate the existing maintenance program effectiveness as it affects energy consumption and provide corrective measures, procedures or alternative methods or system.

Note, for the above (subpara, B-1 thru B-5) analysis a total heat load analysis of the building is not required. Analysis should be based on visual inspection of the steam system within the building.

C. Steam Trap Survey

The information to be provided on each steam trap shall include:

1. Survey Date
2. Building Number/Manhole Number/Drip Leg Location
3. Trap Identification Number
4. Trap Function
5. Manufacturer
6. Type and Size of Trap
7. Inlet and Outlet Steam Pressure and Temperature
8. Trap Condition as determined by ultrasonic testing
9. Recommended Corrective Action (see below)
10. Trap Installation Date (if known)
11. Trap Piping Layouts (Typical)
12. Special Comment as to General System Condition
13. Faulty Piping Practices and Misapplied Steam Traps shall be noted wherever observed.
14. Evaluate the effectiveness of the existing steam trap program (if any) as it affects energy consumption including the procurement procedures, installation and maintenance procedures and provide corrective procedures or alternative methods.

In addition, to the information above, each trap location shall be tagged with a minimum two inch diameter stainless steel identity tag. Each trap location will be referenced on either the CSDS or BSDS general development map or on the individual building sketches, whichever are applicable. All trap information (for items 1 through 9 above) shall be provided in printout form and on floppy disks (see Data Management Provision).

Engineering analyses to support capital and repair project recommendations shall be made especially in reference to proper trap installation and necessary corrective piping configuration and supporting component installation. For traps that are found failed, misapplied or not properly piped, the contractor shall provide sketches and/or photographs and shall describe in writing the corrective procedure required including material, labor, and associated costs. This information is to be provided collectively for each installation as soon as possible as a special separate report in advance of the draft and final reports. For purposes of this study, and to be later verified and compensated for based on actual field investigation, the following assumptions are made:

25% of all inspected traps are failed
5% of all inspected traps are misapplied
5% of all inspected traps are not piped properly

Projects developed must conform to the current MILCON, ECIP, or Special Project criteria as provided by the Navy. Major program changes shall require the contractor to develope a scope-of-work for any required program services. For stand alone boiler plant buildings, only steam trap work shall be performed with no other BSDS work.

D. Steam Distribution Summer Shutdown

III. DATA MANAGEMENT PROVISION

Floppy disks requested for piping and trap information shall use a data base management software capable of providing selected sorts and reports similar to "D-BASE III and/or "LOTUS 1-2-3." The software must be capable of running on a WANG PC or IBM PC limited to 256K of memory. The floppy disks shall be submitted with the draft report along with printouts.

IV. SUBMISSIONS

A. Monthly Progress Reports

The contractor shall furnish monthly progress reports in the form of a letter and shall include a brief statement of the following:

1. Confirmation of any agreements or understandings reached as result of technical meetings of discussions.

2. Delays of scheduling experienced.

3. Work accomplished during reporting period.

4. Problems encountered and unsolved.

5. Percentage of contract completion.

6. Plans for the following month.

The initial report shall include a proposed schedule indicating target dates for initiating/completing various aspects of the work and an estimate of percentage contract completion. The schedule shall be updated as necessary during the course of the contract.

B. Special Advance Data Reports

Two for each installation (See section VI and XI)

C. Draft Report

A draft report shall be issued, one for each installation, in the format of the final report, and shall contain all computations, analyses, sketches, computer software and printouts, and documentation required by the work elements heretofore specified.

D. Final Report

The final report, one for each installation, shall be a successive refinement of the draft report with consideration and incorporation of the Government's comments. The final report shall include detailed analysis describing the recommendations of the energy and monetary savings to be realized, the discounted savings, and the cost of implementation. Sketches shall be included showing major improvements of the central distribution and building steam distribution systems. Detailed energy calculations and cost estimates shall be included to support and justify the recommended improvements. A DD Form 1391 Project Documentation Form shall be filled in to the extent practical for any project over $200,000. A Special Project Submission Form shall be filled in to the extent practical for any project less than $200,000. Supporting project documentation, engineering and economic analyses shall be performed.

The final report shall contain a separate executive summary section and a separate developed project section complete with supporting documentation, economic and engineering analyses. The sketches, computer printouts and field survey data may be separately bound and submitted with the draft report.

V. SCHEDULE

The submissions required by this contract shall be made within the time limitations specified below:

Submission	Time Limitation
Progress Reports	15th day of each month following contract award
Field Survey Report and special reports	First installation 120 days after Government's initial notice to proceed.
Draft Report	First installation 180 days after receipt of the Government's initial notice to proceed. 30 additional days for each installation after Government approval of first installation of draft report.
Final Report	30 days after receipt of Government's comments for each installation

VI. DISTRIBUTION OF REPORTS

Items	No. of Copies	Recipient
Progress Reports	1	LANTNAVFACENGCOM
Field Survey Data Report	2*	LANTNAVFACENGCOM
	2*	LANTNAVFACENGCOM
Special Trap Report	2	
CSDS Special Leaks and bare line repair report	2	
Draft Report	2*	LANTNAVFACENGCOM
Final Report**	7*	LANTNAVFACENGCOM

*For Each Activity Installation

**Two of the final reports for each activity/installation shall be made on 24X microfiche set, one silver and one diazo.

VII. MAILING ADDRESS FOR SUBMISSIONS

LANTNAVFACENGCOM

Commander
Atlantic Division
Attn: Code 1111
Naval Facilities Engineering Command
Norfolk, VA 23511-6287

VIII QUALITY

Five copies of the final report shall be printed legibly on durable white bond paper and bound preferably in a three ring binder loose leaf. Two final reports for each activity/installation shall be made on 24X microfiche set, one silver and one diazo.

IX SECURITY

No employee or representative of the A&E will be admitted to the activity without prior proof of U.S. citizenship, or for alien he or she must be a U.S. permanent resident.

As required, the contractor must obtain security clearance fifteen calendar days before start of work. A minimum of confidential clearance is required at some installation work locations.

X. GOVERNMENT ASSISTANCE

Prior to contract award, assistance regarding this contract shall be directed to the Project Manager, Mr. John Adams, Atlantic Division, Naval Facilities Engineering Command, Code 09A21BT, Norfolk, Virginia 23511, telephone (804) 444-9701.

After contract award, assistance regarding this contract should be made through the Energy Engineering Program Section, Atlantic Division, Naval Facilities Engineering Command, Code 111, Norfolk, Virginia 23511, telephone (804) 444-9582. Point of contact and Engineer-In-Charge is Mr. Jim Torma.

XI. ADDITIONAL PROVISIONS

A. Man-lifts and work trailer and other equipment, as required, shall be provided by A/E the contractor.

B. Pertinent mechanical system drawings of buildings in the BSDS shall be obtained from each installation by the contractor. Approximately 80% of the building drawings are available.

C. For the purpose of cost estimating and establishing a negotiable base, the number of steam traps, the prediction of condition of steam traps, the number and actual buildings to be surveyed, the square footage of buildings to be surveyed, the length of steam lines above ground, the number of manholes, and the availability of steam distribution and building drawings are estimated initially. As part of this scope-of-work, the exact quantity is to be determined and verified in the field and the scope of work is to be modified accordingly and as closely as possible to predetermined negotiated unit cost fees with due consideration given to the order of magnitude of scale and the original estimates.

D. For timeliness of action, special separate reports on steam traps (as previously defined), on the CSDS leaks and bare line repair report and BSDS leaks and bare line repair report shall be provided by the contractor as soon as possible in advance of the draft report.

XII. SURVEY/STUDY REQUIREMENTS

The degree of study varies for the installation. A brief physical description of each installation and the survey/study requirements are as follows:

A. Camp Lejeune

1. Beach Area consist of 6 buildings served by 1200 lineal feet of aboveground steam and condensate distribution lines. Total area served is 62,654 square feet. The steam plant building is BA 106.

2. Camp Geiger consist of 155 buildings with 480,318 square feet of floor space served by both direct buried and overhead steam and condensate lines. There are 23 manholes in the underground portion and 14,400 lineal feet of aboveground lines. The plant building is G-650.

3. Monford Point (Camp Johnson) consist at 92 buildings with 543,358 square feet of floor space. The buildings are served by 16,400 lineal feet of aboveground steam and condensate lines. The plant building is M625.

4. Courthouse Bay area consist of 28 building with 474,746 square feet of floor area. Buildings are served by both underground and overhead steam and condensate lines. There are 10 manholes associated with the underground portion and 7000 lineal feet of aboveground lines. The steam plant is building BB-9.

5. Rifle Range consist of 10 Buildings with a total square feet of 180,258. These building are served by an underground system which has 10 manholes. The steal plant building is RR-15.

6. Paradise Point consist of 17 Buildings with 218,073 square feet. Steam and condensate are distributed in underground piping going through 9 manholes. The steam plant is in building PP2615.

7. New River Air Station consist of 55 Buildings with 1,629,332 square feet. The buildings are served by both aboveground and belowground steam and condensate system. There is 20,500 lineal feet of aboveground line and 12 manholes associated with the belowground portion. The steamplant is AS4151.

8. Hadnot Point (main area) consist of 441 Buildings with 9,010,471 square feet which is served by 21,200 lineal feet of aboveground lines, and a 299 manhole belowground system. The steam plant is building HP1700.

9. Miscellaneous There are 10 building that total 192,000 square feet that have there own steam boiler or are served by adjacent building with a boiler.

B. Cherry Point consist of 122 buildings with a total of 4,331,092 square feet. All steam and condensate lines are underground and includes 194 manholes. The steam plant building is 152.

XIII. CONTRACT OPTIONS (GOVERNMENT DISCRETION)

A. Option I

An option to provide design, documentation and drawings of project recommendations for selected actvities and projects.

B. Option II

An option to provide steam trap services for selected activities.

C. Option III

An option to provide Post Construction Contract Award Work (PCCAW).

D. Option IV

Construction inspection services.