

Procuring a Design

Project engineer's perspective on starting the design process and establishing the A/E scope of work



Frank C. Quigley
General Engineer
Space and Security Management Division
National Archives and Records Administration

Example: Project to Replace an Air Handler

Limited Description and Background Info

1. Project group may be asked to procure design & construction with limited information about the project .
2. Project approved and funds provided to ...
“Replace Air Handling Unit, AHU-2”

Define the Project

Know what you are building and why from the start.

- Written Project Description
- Written Justification for the Project

Establish Project Team

End User

Facility Maintenance

Contracting

Technical/Engineering

Preservation

Security

Other

Example: Expanded Description

Description:

Remove the existing air handler serving the archival records storage area and replace it with an air handler designed to meet current environmental standards per NARA 1571. Replacement will include expansion of mechanical room B-1 to accommodate addition filtration and humidity control equipment.

Justification:

Air Handling Unit AHU-2 is approximately 20 years old and the 2004 building condition report indicated that it was nearing the end of its useful life. Monitoring data indicates difficulty in achieving required humidity levels. Additionally, the units standard office type filters do not provide gaseous and particulate required by NARA standards. Space restrictions in the existing mechanical room requires will likely require an expansion of the room in order to fit the new equipment. See report of environmental conditions prepared by NARA conservation staff dated 7/13/2005.

Expand Project Description

Clarify Location/Available Space

- New Space, Renovated Space, Equipment Upgrade ?
- Size of Space?
- Will Replacement Equipment Increase or Decrease in Size ?
- Is Additional Equipment Required?
- Is the Project Location Clear to All Parties?
- Location Sketch?

Work With Project Team

Expand Project Description/Design Program

What Type of Space?

- Records Storage: Textual/Non-textual
- Artifact Storage
- Exhibits
- Cold Storage
- Electronic Media
- General Office
- Building Service/Mechanical

Who Will Use The Space?

- Visitors, Employees, Contractors, Volunteers, Contractors
- Type of Space They Need, Current & Future Needs?

Limitations?

- Project Budget?
- Site or Location?

Identify Standard Design Criteria and Reference Publications: Examples ...

- ASHRAE
- NARA §1228 Subpart K
- Facility Standards for Records Storage
- NARA 1571 Archival Storage Standards
- Presidential Library Design Standards
- Security, Maintenance, Fire Protection Standards

Design Criteria

ENVIRONMENT

- Temperature and Humidity
- Air Changes Per Hour
- Pressure: Positive/Negative/Neutral
- Noise Control (NC rating)
- Pre-Filter Requirements
- After-Filter Requirements
- Control: In-Room/Remote
- Condition Monitoring: Recording Devices/Alarms
- Particulate and/or Specialty Filtration:
- Charcoal/Gas-Phase Filtration
- Outside Air Requirements

Design Criteria

RELIABILITY

- Is Redundancy Required? Partial or 100%?
- Connect HVAC System to Emergency Power?
- Is There an Existing Emergency Generator? Adequate Capacity?

SPECIALTY

- Dedicated Exhaust Requirements? i.e. Laboratory
- Equipment Size and/or Placement Restrictions?
- Compatibility With Existing Equipment and Controls?

Submittal Requirements

- How Many Submissions?
 - Additional schematics or programming required?
 - Simple equipment replace, no schematics required?
- Quality and Content of Each Submission?
 - Define specific requirements?
- Schedule of Submissions?
 - When is the design needed?
 - How much in-house review time?
- Meetings and Presentations?
- Format & Number of Submissions?
 - Who needs review copies?

Submission Content

Department of Veterans Affairs Examples

SCHEMATIC 1 (S1):

1. Provide estimated heating and cooling loads based on floor area.
2. Coordinate estimated preliminary steam demand with steam generation designer.
3. Investigate condition and available capacity of existing utilities.
4. Provide description of tentative zoning.
5. Select three different applicable systems for life cycle cost analysis.
6. Provide a list of energy conservation measures to be used in design, and life cycle cost analysis.

Submission Content

Department of Veterans Affairs Examples

SCHEMATIC 2 (S2):

1. Provide description of HVAC systems and equipment for each functional space.
2. Provide complete life cycle cost analysis with specific recommendations and full back-up data.
3. Provide heating and cooling capacities of each functional area , and block loads for each building.
4. Indicate tentative locations and sizes of all mechanical equipment rooms, and main shafts.
5. Show block layouts of major pieces of equipment.
6. Resolve locations of louvers etc.

Other

- Compile drawings and reports that will help the architect/engineer
- Requirements to provide “bid-sets” and A/E assistance during bidding
- Decide if A/E services are required during construction
- Specific consultants required? Fire-protection engineer?
Conservator?
- Cost estimating requirements?

Design Expectations

MINIMUM REQUIREMENTS FOR ASHRAE STUDENT DESIGN COMPETITION

1. Statement of subsystem criteria and goals.
2. Descriptions of how the design satisfied these criteria and goals.
3. Descriptions of how and why the final system or architectural design was selected.
4. Supporting calculations.
5. Design drawings and/or schematic flow diagrams.