

## SECTION I: BASIS OF PROJECT DECISION

### A. BUSINESS STRATEGY

#### A1. Building Use Requirements

Identify and list building uses or functions. These may include uses such as:

- |  |  |
|--|--|
| <input type="checkbox"/> Retail (AAFES)            | <input type="checkbox"/> Ranges  |
| <input type="checkbox"/> Institutional             | <input type="checkbox"/> Office  |
| <input type="checkbox"/> Instructional             | <input type="checkbox"/> Light Manufacturing   |
| <input type="checkbox"/> Medical                   | <input type="checkbox"/> Housing   |
| <input type="checkbox"/> Storage                   | <input type="checkbox"/> Maintenance   |
| <input type="checkbox"/> Food Service              | <input type="checkbox"/> Deployment Facilities   |
| <input type="checkbox"/> Recreational (Gyms, etc.) | <input type="checkbox"/> Other (Chapel, Complexes, ACPs,<br>Firestations, MP Stations, etc.) |
| <input type="checkbox"/> Research                  |  |

A description of other options which could also meet the facility need should be defined. (As an example, was renovating existing space rather than building new space considered?) A listing of current facilities that will be vacated due to the new project should be produced.

#### A2. Business Justification

Identify driving forces for the project and specify what is most important from the viewpoint of the owner including both needs and expectations. Address items such as:

- |   |  |
|---|--|
| <input type="checkbox"/> Need date                          | <input type="checkbox"/> Sustainability considerations,<br>including possible certification (for<br>example, by the U.S. Green<br>Building Council). |
| <input type="checkbox"/> End User                           |  |
| <input type="checkbox"/> Building utilization justification |  |
| <input type="checkbox"/> Level of amenities                 |  |
| <input type="checkbox"/> Location                           | <input type="checkbox"/> Other   |

**A3. Business Plan**

A project strategy should be developed that supports the business justification in relation to the following items:

- Funding availability
- Cost and financing
- Schedule milestones (including known deadlines)
- Types and sources of project funds
- Related/resulting projects
- Other

**A4. Economic Analysis**

An economic analysis should be developed to determine the viability of the venture and evaluate the various alternatives to meet the project requirement. The analysis should clearly show multiple equivalent alternatives and acknowledge the uncertainties of the analysis. The analysis should also consider the economic impact of early or late project delivery. Each month of late delivery at the project end equates to what kind of negative impact on the operating revenue for the business. The analysis should also indicate what “certification” level of environmental sustainability is being targeted. It should acknowledge items such as:

- Design life
- Building ownership (Joint Basing)
- Long-term operating and maintenance costs
- Long-term use plan
- Analysis of capital and operating cost versus sales or occupancy and profitability (Relocatables, NAF)
- Other

## A5. Facility Requirements

Facility size requirements are many times determined by applicable code, circumstance, or site conditions and are often driven by occupancy. Note that this analysis is at the macro level at this point. Security and anti-terrorism are critical considerations. Ongoing security operations during the construction phase and in the operation of the completed facility should be carefully planned in coordination with the responsible entity during this early planning cycle. Additionally, early adoption and identification of anti-terrorism standards is critical to the design phase because multiple tradeoffs exist for all facility systems that can satisfy anti-terrorism requirements. Some considerations are listed below:

- Real property capacity
- Use flexibility
- Number of occupants
- Volume
- Net and gross square footage by area uses
- Support infrastructure
- Classroom size
- Number of laboratory stations
- Standard design
- Occupant accommodation requirements (i.e., number of hospital beds, number of desks, number of workstations, onsite child care, on-site medical care, cot space)
- Identify operational security system requirements for both facility infrastructure and human assets.
- Identify any anti—terrorism standards that are applicable to the project or as adopted by the owner.
- Other

**A6. Future Expansion/Alteration Considerations**

The possibility of expansion and/or alteration of the site and building should be considered for facility design. These considerations consist of a list of items that will facilitate the expansion or evolution of building use including adaptability/flex ability.

Evaluation criteria may include:

- Provisions for site space in case of possible future expansion up or out
- Technologically advanced facility requirements
- “Grow in place” intentions for departments or functional areas during the future phase
- Identify functional areas that are more likely to move out of the building in the future to allow others to expand or move in
- Future building occupants in 5, 10, 15, or 20 years
- Flexibility or adaptability for future uses
- Future phasing plan
- Consideration of future expansion of the building or functions with the master plan
- Other

**A7. Site Selection Considerations**

Evaluation of sites should address issues relative to different locations (i.e., global, country, or local). This evaluation may take into consideration existing buildings or properties, as well as new locations. The selection criteria include items such as:

- General geographic location
- Access to the targeted user
- Local availability and cost of skilled labor (e.g., construction, operation)
- Available utilities
- Existing Facilities
- Land availability and developed costs (e.g., utilities)
- Legal constraints
- Unusual financing requirements in region/locality/state (e.g., TXdot bridge)
- Cultural concerns
- Community relations
- Labor relations
- Government relations
- Political issues/constraints
- Education/training
- Safety and health considerations
- Environmental issues
- Symbolic and aesthetic
- Historical/archaeological considerations
- Weather/climate
- Permitting schedule
- Sustainability analysis (such as Leadership in Energy and Environmental Design (LEED) Certification)
- Security and anti-terrorism analysis
- Other

**A8. Project Objectives Statement**

This statement defines the project objectives and priorities for meeting the business strategy. It should be clear, concise, measurable, and specific to the project. It is desirable to obtain total agreement from the entire project team regarding these objectives and priorities to ensure alignment. Specifically, the priorities among cost, schedule, and value-added quality features should be clear. The objectives also should comply with any master plan documents. To ensure the project is aligned to the applicable objectives, the following should be considered:

- Stakeholder’s understanding of objectives, including questions or concerns
- Constraints or limitations placed on the project
- Typical objectives:
  - Safety
  - Quality
  - Cost
  - Schedule
  - Technology usage
  - Capacity or size
  - Startup or commissioning
  - Communication
  - Operational performance
  - Maintainability
  - Security
  - Sustainability
  - Other

## **B. OWNER PHILOSOPHIES**

### **B1. Reliability Philosophy**

A brief description of the project intent in terms of reliability should be defined. A list of general design principles to be considered to achieve optimum/ideal operating performance from the facility/building should be addressed. The reliability and criticality of the facility itself should also be agreed to by the team. Considerations may include:

- Critical systems redundancy
- Architectural/structural/civil durability
- Mechanical/electrical/plumbing reliability
- Security and anti-terrorism
- Other

### **B2. Maintenance Philosophy**

A list of the general design principles to be considered to meet building maintenance requirements should be identified. This evaluation should include life cycle cost analysis of major facilities. Considerations may include:

- Daily occupancy loads by area
- Selection of materials and finishes
- Maximum building occupancy requirements
- Requirements for building finishes
- Other
- Equipment monitoring requirements
- Energy conservation programs

**B3. Operating Philosophy**

A list of the general design issues that need to be considered to support routine operations should be developed. Issues may include:

- Operating schedule/hours
- Provisions for building occupancy assignments (i.e., by room, floor, suite) including flexibility of partitioning
- Future renovations schedule
- User finish out philosophy
- Uncontrolled access to the area immediately around the building for cars and trucks should be carefully considered
- Flexibility to change layout
- Other

**B4. Design Philosophy**

A listing of design philosophy issues should be developed. These issues should be directed at concerns such as the following:

- Design life
- Aesthetic requirements:
  - Theme or style in accordance with IDG
  - Image (HQ type, maintenance, special facilities)
- Compatibility with master plan
- Environmentally sustainable design (internal/external) and level of certification, if applicable
- Quality of life
- Requirements of anti-terrorism design standards
- Other

## C. PROJECT REQUIREMENTS

### C1. Value-Analysis Process

A structured value analysis approach should be in place to consider design and material alternatives in terms of their cost effectiveness, including sustainability considerations. Items that impact the economic viability of the project should be considered. Items to evaluate include issues such as:

- Discretionary scope issues
- Expensive materials of construction
- Life-cycle analysis of construction materials, methods, and structure
- Cost of a sustainable design
- Other

### C2. Project Design Criteria

Project design criteria are the requirements and guidelines which govern the design of the project. Security and Anti-Terrorism standards need to be identified early-on in order for the designer to have maximum flexibility when evaluating trade-offs between materials, systems, and the physical configuration of the facility (perhaps stated below in the bullets). Any design review board or design review process should be clearly articulated. Evaluation criteria may include:

- |  |   |
|--|---|
| <input type="checkbox"/> Level of design detail required                   | <input type="checkbox"/> Utilization of design standards:           |
| <input type="checkbox"/> Codes and standards:                              | <input type="checkbox"/> User                                       |
| <input type="checkbox"/> National  | <input type="checkbox"/> Industry                                   |
| <input type="checkbox"/> Owner Specific                                    | <input type="checkbox"/> Mixed                                      |
| <input type="checkbox"/> Local   | <input type="checkbox"/> Installation preferences                   |
| <input type="checkbox"/> International                                     | <input type="checkbox"/> Environmental sustainability certification |
| <input type="checkbox"/> Security operations                               | <input type="checkbox"/> Other                                      |
| <input type="checkbox"/> Anti-Terrorism                                    |   |
| <input type="checkbox"/> Sole source requirements for equipment or systems |   |
| <input type="checkbox"/> Climatic data                                     |   |

### **C3. Evaluation of Existing Facilities**

If existing facilities are available, then a condition assessment must be performed to determine if they will meet facility requirements. Modification to the existing facility may require modifications to codes or permits. If the existing facility is to be removed, portions of the facility may be recycled into the new facility (brick, structural steel). Evaluation criteria may include:

- Capacity
  - Power Utilities (i.e., potable water, gas, oil)
  - Fire water
  - Waste treatment/disposal
  - Sanitary sewer
  - Telecommunications
  - Security
  - Storm water containment system/filtration
- Access:
  - Rail accessibility standards
  - Roads
  - Parking areas
- Type and size of buildings/structures
- Amenities:
  - Break rooms/Food service
  - Ambulatory access
  - Medical facilities
  - Recreation facilities including public outdoor spaces
  - Change rooms
- Condition assessment of existing facilities and infrastructure
- Historic/archeological survey
- Other

#### **C4. Scope of Work Overview**

A complete narrative description of the project laying out the major components of work to be accomplished, generally discipline oriented, should be developed. This narrative should be tied to a high level Work Breakdown Structure (WBS) for the project. Items to consider would include:

- Sequencing of work
- Interface issues for various contractors, consultants, contracts, or work packages
- Other

#### **C5. Project Schedule**

Ideally, the project schedule should be developed by the project team (owner, A/E, and construction contractor). It should include milestones, unusual schedule considerations and appropriate master schedule contingency time (float), procurement of long-lead or critical pacing equipment, and required submissions and approvals. This schedule should involve obtaining early input from:

- Occupant/Operations
- Architects/Engineers
- Construction
- Procurement
- Installation

### C6. Project Cost Estimate

The project cost estimate should address all costs necessary for completion of the project.

This cost estimate may include the following:

- Construction contract estimate
- Professional fees for design build
- Land cost, to include mitigation and/or set asides
- Furnishings
- Administrative costs
- Contingencies
- Cost escalation justification
- Overhead
- Safety
- Miscellaneous expenses including but not limited to:
  - Specialty consultants
  - Inspection and testing services
  - Bidding costs
  - Site clearance (UXO, etc)
  - Bringing utilities to the site
  - Environmental impact mitigation measures
  - Local authority permit fees
  - Occupant moving and staging costs
  - Sureties
- Type and size of buildings/ structures
- Labor productivity/ prevailing wage rates
- Utility costs during construction (connection fees, construction usage)
- Site surveys, soils tests
- Availability of construction lay down and storage at site or in remote or rented facilities
- Installation of the operation security system
- Other

## **SECTION II: BASIS OF DEISGN**

### **D. SITE INFORMATION**

#### **D1. Site Layout**

The facility should be sited on the selected property. Layout criteria may include items such as:

- Access (e.g., road, rail, marine, air)
- Construction access
- Historical/cultural
- Trees and vegetation
- Site massing and context constraints or guidelines (i.e., how a building will look in three dimensions at the site)
- Nearby mass transit
- Access transportation parking, delivery/service, and pedestrian circulation considerations
- Open space, street amenities, “urban context concerns”
- Climate, wind, and sun orientation for natural lighting views, heat loss/gain, energy conservation, and aesthetic concerns
- Anti-terrorism force protection
- Site Adjacencies
- Other

## D2. Site Surveys

The site should be surveyed for the exact property boundaries, including limits of construction. A topography map with the overall plot and site plan is also needed. Evaluation criteria may include:

- |  |  |
|--|--|
| <input type="checkbox"/> Legal property descriptions with property lines | <input type="checkbox"/> Proximity to drainage ways and flood plains                           |
| <input type="checkbox"/> Easements                                       | <input type="checkbox"/> Known below grade structures and utilities (both active and inactive) |
| <input type="checkbox"/> Rights-of-way                                   | <input type="checkbox"/> Trees and vegetation  |
| <input type="checkbox"/> Drainage patterns                               | <input type="checkbox"/> Existing facility locations and conditions                            |
| <input type="checkbox"/> Deeds   | <input type="checkbox"/> Wetlands locations  |
| <input type="checkbox"/> Definition of final site elevation              | <input type="checkbox"/> Location of mass transit  |
| <input type="checkbox"/> Benchmark control systems                       | <input type="checkbox"/> Other   |
| <input type="checkbox"/> Setbacks  |  |
| <input type="checkbox"/> Access and curb cuts                            |  |

## D3. Civil/Geotechnical Information

The civil/geotechnical site evaluation provides a basis for foundation, structural, and hydrological design. Evaluations of the proposed site should include items such as:

- |   |   |
|---|---|
| <input type="checkbox"/> Depth of bedrock   | <input type="checkbox"/> Soil percolation rate and conductivity   |
| <input type="checkbox"/> General site description (e.g., terrain, soils type, existing structures, spoil removal, areas of hazardous waste) | <input type="checkbox"/> Ground water flow rates and directions   |
| <input type="checkbox"/> Expansive or collapse potential of soils   | <input type="checkbox"/> Need for soil treatment or replacement   |
| <input type="checkbox"/> Fault line locations   | <input type="checkbox"/> Description of foundation design options |
| <input type="checkbox"/> Spoil area for excess soil (i.e., location of on-site area or offsite instructions)                                | <input type="checkbox"/> Allowable bearing capacities             |
| <input type="checkbox"/> Seismic requirements   | <input type="checkbox"/> Pier/pile capacities                     |
| <input type="checkbox"/> Water table elevation  | <input type="checkbox"/> Paving design options                    |
| <input type="checkbox"/> Flood plain analysis   | <input type="checkbox"/> Overall site analysis                    |
|   | <input type="checkbox"/> Other                                    |

#### D4. Governing Regulatory Requirements

The local, state, and federal government permits necessary to construct and operate the facility should be identified. A work plan should be in place to prepare, submit, and track permit, regulatory, re-zoning, and code compliance for the project, including responsibility for permitting process. It should include items such as:

- |  |  |
|--|--|
| <input type="checkbox"/> Construction            | <input type="checkbox"/> Historical issues             |
| <input type="checkbox"/> Unique requirements     | <input type="checkbox"/> Accessibility                 |
| <input type="checkbox"/> Environmental (NEPA)    | <input type="checkbox"/> Demolition                    |
| <input type="checkbox"/> Structural calculations | <input type="checkbox"/> Solar                         |
| <input type="checkbox"/> Building height limits  | <input type="checkbox"/> Platting                      |
| <input type="checkbox"/> Setback requirements    | <input type="checkbox"/> Air/water                     |
| <input type="checkbox"/> Fire                    | <input type="checkbox"/> Transportation (FAA)          |
| <input type="checkbox"/> Building                | <input type="checkbox"/> Anti-terrorism standards      |
| <input type="checkbox"/> Occupancy               | <input type="checkbox"/> Installation specific permits |
| <input type="checkbox"/> Special                 | <input type="checkbox"/> Airfield clearance            |
| <input type="checkbox"/> Signage                 | <input type="checkbox"/> Other                         |

The codes that will have significant impact on the scope of the project should also be investigated and explained in detail. Pay particular attention to local requirements. Regulatory and code requirements may affect the defined physical characteristics and project cost estimate. The project schedule may be affected by regulatory approval processes. For some technically complex buildings, regulations may change frequently.

**D5. Environmental Assessment**

An environmental assessment should be performed for the site to evaluate issues that can impact the cost estimate or delay the project. These issues may include:

- Archeological
- Location in a sensitive air quality zone
- Location in a wet lands area
- Environmental permits now in force
- Existing contamination
- Location of nearest residential area
- Ground water monitoring in place
- Downstream uses of ground water
- Existing environmental problems with the site
- Past/present use of site
- Noise/vibration requirements
- Air/water discharge requirements and options evaluated
- Discharge limits of sanitary and storm sewers identified
- Detention requirements
- Endangered species
- Erosion/sediment control
- Brownfield development alternatives and impacts
- Other

**D6. Utility Sources with Supply Conditions**

The availability/non-availability of site utilities needed to operate the facility with supply conditions of quantity, temperature, pressure, and quality should be evaluated. This may include items such as:

- |  |  |
|--|--|
| <input type="checkbox"/> Non-potable water | <input type="checkbox"/> Steam   |
| <input type="checkbox"/> Drinking water    | <input type="checkbox"/> Electricity (voltage levels)                              |
| <input type="checkbox"/> Cooling water     | <input type="checkbox"/> Communications (e.g., data, cable television, telephones) |
| <input type="checkbox"/> Fire water        | <input type="checkbox"/> Special requirements (e.g., deionized water or oxygen)    |
| <input type="checkbox"/> Sewers            | <input type="checkbox"/> Other   |
| <input type="checkbox"/> Heating water     |  |
| <input type="checkbox"/> Gases             |  |

**D7. Site Life Safety Considerations**

Fire and life safety related items should be taken into account for the selected site. These items should include fire protection practices at the site, available firewater supply (amounts and conditions), and special safety requirements unique to the site. Evaluation criteria may include:

- Wind direction indicator devices (e.g., wind socks)
- Fire monitors and hydrants
- Flow testing
- Access and evacuation plan
- Available emergency medical facilities
- Security considerations (site illumination, access control)
- Onsite medical care
- Other

**D8. Special Water and Waste Treatment Requirements**

On-site or pretreatment of water and waste should be evaluated. Items for consideration may include:

- Wastewater treatment
- Process waste
- Sanitary waste
- Waste disposal
- Storm water containment and treatment
- Water re-use
- Other

## E. BUILDING PROGRAMMING

### E1. Program Statement

The program statement identifies the levels of performance for the facility in terms of space planning and functional relationships. It should address the human, physical, and external aspects to be considered in the design. Each performance criteria should include these issues:

- A performance statement outlining what goals are to be attained (e.g., providing sufficient lighting levels to accomplish the specified task safely and efficiently)
- A measure that must be achieved
- A test which is an accepted approach to establish that criterion has been met (e.g., using a standard light meter to do the job)
- Other

### E2. Building Summary Space List

The summary space list includes all space requirements for the entire project. This list should address specific types and areas. Possible space listings include:

- |  |   |
|--|---|
| <input type="checkbox"/> Building population               | <input type="checkbox"/> Lounges                        |
| <input type="checkbox"/> Administrative offices            | <input type="checkbox"/> Food Service Cafeteria         |
| <input type="checkbox"/> Conference rooms                  | <input type="checkbox"/> Electrical rooms/communication |
| <input type="checkbox"/> Vending alcoves                   | <input type="checkbox"/> Parking space                  |
| <input type="checkbox"/> Janitorial closets                | <input type="checkbox"/> Entry lobby                    |
| <input type="checkbox"/> Elevators                         | <input type="checkbox"/> Restrooms                      |
| <input type="checkbox"/> Stairs                            | <input type="checkbox"/> Data/computer areas            |
| <input type="checkbox"/> Loading docks                     | <input type="checkbox"/> Maintenance/ vehicle bays      |
| <input type="checkbox"/> Dwelling units                    | <input type="checkbox"/> Hangers                        |
| <input type="checkbox"/> Special technology considerations | <input type="checkbox"/> SCIF                           |
| <input type="checkbox"/> Classrooms                        | <input type="checkbox"/> EOC                            |
| <input type="checkbox"/> Laboratories                      | <input type="checkbox"/> Security space                 |
| <input type="checkbox"/> Corridors                         | <input type="checkbox"/> Arms room                      |
| <input type="checkbox"/> Storage facilities                | <input type="checkbox"/> Simulator rooms                |
| <input type="checkbox"/> Mechanical rooms                  | <input type="checkbox"/> Exam rooms                     |
| <input type="checkbox"/> Mail room                         | <input type="checkbox"/> Other                          |
| <input type="checkbox"/> Laundry                           |   |

A room data sheet should correspond to each entry on the summary space list. Room data sheets are discussed in element E11. The room data sheet contains information that is necessary for the summary space list. This list is used to determine assignable (usable) and non-assignable (gross) areas.

### **E3. Overall Adjacency Diagrams**

The overall adjacency diagrams depict the layout of each department or division of the entire building. They show the relationship of specific rooms, offices, and sections. The adjacency diagrams must adequately convey the overall relationships between functional areas within the facility. Note that these diagrams are sometimes known as “bubble diagrams” or “balloon diagrams.” They are also commonly expressed in an adjacency matrix. Anti-terrorism standards should use adjacency diagrams to confirm that configuration and set back instances have been met.

### **E4. Stacking Diagrams**

A stacking diagram portrays each department or functional unit vertically in a multi-story building. Stacking diagrams are drawn to scale, and they can help establish key design elements for the building. These diagrams are easily created with space lists and adjacency (or bubble) diagrams. Critical vertical relationships may relate to circulatory (stairs, elevators), structural elements, and mechanical or utility shafts.

Stacking diagrams can establish building elements such as floor size. This type of diagram often combines functional adjacencies and space requirements and also shows how the project is sited.

### **E5. Growth and Phased Development**

Provisions for future phases or anticipated use change must be considered during project programming. A successful initial phase necessitates a plan for the longer term phase. The following phase issues may be addressed.

- Guidelines to allow for additions (i.e., over-design of structural systems, joist layout, column spacing)
- Technology needs as facility grows and expands or changes (e.g., mechanical systems, water demands)
- Compare the additional costs involved with making the building “expandable” versus the probability of the future expansion occurring as envisioned.
- Provisions for infrastructure that allow for future expansion

### **E6. Circulation and Open Space Requirements**

An important component of space programming is common-area open spaces, both interior and exterior. These areas include the items listed and considerations such as:

- |   |   |
|---|---|
| <input type="checkbox"/> Exterior:  | <input type="checkbox"/> Fire and life-safety circulation considerations  |
| <input type="checkbox"/> Service dock areas and access                                | <input type="checkbox"/> Fueling Facility   |
| <input type="checkbox"/> Circulation to parking areas                                 | <input type="checkbox"/> Mission specific requirements  |
| <input type="checkbox"/> Pedestrian walkways  | <input type="checkbox"/> Vehicle/Aircraft wash rack   |
| <input type="checkbox"/> Courtyards, plazas, or parks                                 | <input type="checkbox"/> Interior:  |
| <input type="checkbox"/> Landscape buffer areas                                       | <input type="checkbox"/> Lobbies  |
| <input type="checkbox"/> Unbuildable areas (e.g., wetlands or slopes)                 | <input type="checkbox"/> Interior aisle ways and corridors  |
| <input type="checkbox"/> Sidewalks or other pedestrian routes                         | <input type="checkbox"/> Vertical circulation (i.e., personnel and material transport including elevators and escalators) |
| <input type="checkbox"/> Bicycle facilities   | <input type="checkbox"/> Ambient lighting   |
| <input type="checkbox"/> Entry  | <input type="checkbox"/> Directional and location signage   |
| <input type="checkbox"/> Security considerations (e.g., card access and transmitters) | <input type="checkbox"/> Other  |
| <input type="checkbox"/> Snow removal plan  |   |
| <input type="checkbox"/> Waste removal  |   |

**E7. Functional Relationship Diagrams/ Room by Room**

Room by room functional relationship diagrams show the structure of adjacencies of a group of rooms. With these adjacency diagrams (also known as bubble diagrams), the architect can convert them into a floor plan with all the relationships. Each space detail sheet should have a minimum of one functional relationship diagram. Rooms are often represented by circles, bubbles, squares, or rectangles. Larger rooms are represented with bigger symbols. They are also commonly expressed in an adjacency matrix.

**E8. Loading/Unloading/Storage Facilities Requirements**

A list of requirements identifying materials to be unloaded and stored and products to be loaded along with their specifications. This list should include items such as:

- Storage facilities to be provided and/or utilized
- Refrigeration requirements and capabilities
- Mail/small package delivery
- Recycling requirements
- Other

**E9. Transportation Requirements**

Specifications for implementation of facility transportation (e.g., roadways, conveyers, elevators) as well as methods for receiving and shipping of materials (e.g., air, rail, truck, marine) should be identified. Provisions should be included for items such as:

- Facility access requirements based on transportation
- Drive-in doors
- Extended ramps for low clearance trailers
- Refrigeration requirements and capabilities
- Rail car access
- Service elevators
- Loading docks
- Temporary parking
- Dumpster requirements
- Taxiways/helipads
- Other

### **E10. Building Finishes**

Levels of interior and exterior finishes should be defined for the project. For example, the finishes may include categories such as:

#### **Interior Schedule:**

- Type A:
  - Floor: vinyl composition tile
  - Walls: painted
- Type B:
  - Floor: direct glue carpets
  - Walls: vinyl wall covering
- Type C:
  - Floor: carpet over pad
  - Walls: wood paneling

#### **Exterior Schedule:**

- Type 1:
  - Walls: brick
  - Trim: brick
- Type 2:
  - Walls: overlapping masonry
  - Trim: cedar

Finishes and local design standards are further defined in category F.

### **E11. Room Data Sheets**

Room data sheets contain the specific requirements for each room considering its functional needs. A room data sheet should correspond to each room on the building summary space list. The format of the room data sheet should be consistent. Possible issues to include on room data sheets are:

- Critical dimensions
- Technical requirements (e.g., fireproof, explosion resistance, X-ray)
- Furnishing requirements
- Equipment requirements
- Finish type
- Environmental issues
- Audio/visual (A/V) data and communication provisions
- Lighting requirements
- Utility requirements
- Security needs including access/hours of operation
- Acoustics/vibration requirements
- Life-safety
- Other

### **E12. Furnishings, Equipment, and Built-ins**

All moveable furnishings, equipment, and built-ins should be listed on the room data sheets. Moveable and fixed in place equipment should be distinguished. Building modifications, such as wide access doors or high ceilings, necessary for any equipment also need to be listed. Long delivery time items should be identified and ordered early. It is critical to identify the utility impact of equipment (e.g., electrical, cooling, special water or drains, venting, radio frequency shielding). Examples may include:

- |  |  |
|--|--|
| <input type="checkbox"/> Furniture         | <input type="checkbox"/> Partitions                |
| <input type="checkbox"/> Kitchen equipment | <input type="checkbox"/> Exterior building signage |
| <input type="checkbox"/> Medical equipment | <input type="checkbox"/> Mission equipment         |
| <input type="checkbox"/> Material handling | <input type="checkbox"/> Other                     |

New items and relocated existing items must be distinguished in the program. The items can be classified in the following categories.

- |   |  |
|---|--|
| <input type="checkbox"/> New items:                                 | <input type="checkbox"/> Relocated as is/ contractor installed |
| <input type="checkbox"/> Contractor furnished/ contractor installed | <input type="checkbox"/> Refurbished/ contractor installed     |
| <input type="checkbox"/> Government furnished/ contractor installed | <input type="checkbox"/> Relocated as is/ Government installed |
| <input type="checkbox"/> Government furnished/ Government installed | <input type="checkbox"/> Refurbished/ Government installed     |
| <input type="checkbox"/> Other                                      |  |
| <input type="checkbox"/> Existing items:                            | <input type="checkbox"/> Other                                 |

### **E13. Window Treatment**

Any special fenestration window treatments for energy and/or light control should be noted in order to have proper use of natural light. Some examples include:

- |  |   |
|--|---|
| <input type="checkbox"/> Blocking of natural light | <input type="checkbox"/> Exterior louvers |
| <input type="checkbox"/> Glare reducing windows    | <input type="checkbox"/> Interior blinds  |
| <input type="checkbox"/> AT glazing                | <input type="checkbox"/> Other            |
| <input type="checkbox"/> Ballistic film            |   |

## F. BUILDING/PROJECT DESIGN PARAMETERS

### F1. Civil/Site Design

Civil/site design issues should be addressed to provide a basis for facility design. Issues to address may include:

- |   |  |
|---|--|
| <input type="checkbox"/> Service and storage requirements                         | <input type="checkbox"/> Site utilities        |
| <input type="checkbox"/> Elevation and profile views                              | <input type="checkbox"/> Earth work            |
| <input type="checkbox"/> High point elevations for grade, paving, and foundations | <input type="checkbox"/> Subsurface work       |
| <input type="checkbox"/> Location of equipment                                    | <input type="checkbox"/> Paving/curbs          |
| <input type="checkbox"/> Minimum overhead clearances                              | <input type="checkbox"/> Landscape             |
| <input type="checkbox"/> Storm drainage system                                    | <input type="checkbox"/> Fencing/site security |
| <input type="checkbox"/> Location and route of underground utilities              | <input type="checkbox"/> Other                 |

### F2. Architectural Design

Architectural design issues should be addressed to provide a basis for facility design. These issues may include the following:

- |   |   |
|---|---|
| <input type="checkbox"/> Determination of metric (hard/soft) versus Imperial (English) units    | <input type="checkbox"/> SHPO Review Boards                               |
| <input type="checkbox"/> Requirements for building location/orientation horizontal and vertical | <input type="checkbox"/> IDG  |
| <input type="checkbox"/> Access requirements  | <input type="checkbox"/> Circulation considerations                       |
| <input type="checkbox"/> Nature/character of building design (e.g., aesthetics)                 | <input type="checkbox"/> Seismic design considerations                    |
| <input type="checkbox"/> Construction materials   | <input type="checkbox"/> Color/material standards                         |
| <input type="checkbox"/> Acoustical considerations  | <input type="checkbox"/> Hardware standards                               |
| <input type="checkbox"/> Accessibility requirements   | <input type="checkbox"/> Furniture, furnishings, and accessories criteria |
|   | <input type="checkbox"/> Design grid                                      |
|   | <input type="checkbox"/> Floor to floor height                            |
|   | <input type="checkbox"/> Anti-terrorism standards                         |
|   | <input type="checkbox"/> Other  |

Note: The term “hard” metric means that materials and equipment are identified on the drawings and have to be delivered in metric-sized unit dimensions such as 200mm by 400mm. “Soft” metric means that materials and equipment can be delivered using sizes that approximate the metric dimensions given on the drawings, such as three-inch length instead of eight cm. It is important to set these dimensions and not “mix and match.”

### **F3. Structural Design**

Structural design considerations should be addressed to provide a basis for the facility design. These considerations may include the following:

- Structural system (e.g., construction materials, constraints)
- Seismic requirements
- Foundation system
- Corrosion control requirements/required protective coatings
- Standard/Industry specifications (e.g., basis for design loads, vibration, deflection)
- Future expansion/flexibility considerations
- Design loading parameter (e.g., live/dead loads, design loads, collateral load capacity, equipment/material loads, wind/snow loads, uplift)
- Functional spatial constraints
- Other

#### F4. Mechanical Design

Mechanical design parameters should be developed to provide a basis for facility design.

Items to consider include:

- Special ventilation or exhaust requirements
- Equipment/space special requirements with respect to environmental conditions (e.g., air quality, special temperatures)
- Energy conservation and life cycle costs
- Acoustical requirements
- Zoning and controls
- Air circulation requirements
- Outdoor design conditions (e.g., minimum and maximum yearly temperatures)
- Indoor design conditions (e.g., temperature, humidity, pressure, air quality)
- Building emissions control
- Utility support requirements
- System redundancy requirements
- Plumbing requirements
- Special piping requirements
- Seismic requirements
- Fire protection systems requirements
- Environmentally-friendly HVAC systems
- Alternate energy systems
- Special mission requirements
- Other

#### F5. Electrical Design

Electrical design parameters provide the basis for facility design. Consider items such as:

- Power sources with available voltage/amperage
- Special lighting considerations (e.g., lighting levels, color rendition)
- Voice, data, and video communication requirements
- Uninterruptible power source (UPS) and/or emergency power requirements
- Energy consumption/ conservation and life cycle cost
- Ability to use daylight in lighting
- Seismic requirements
- Lightning/grounding requirements
- Outdoor lighting requirements
- Special mission requirements (e.g., AF 400 hz)

**F6. Building Life Safety Requirements**

Building life safety requirements are a necessity for building operations. They should be identified at this stage of the project. Possible safety requirements are listed below:

- |   |   |
|---|---|
| <input type="checkbox"/> Fire resistant requirements                        | <input type="checkbox"/> Emergency equipment access   |
| <input type="checkbox"/> Explosion resistant requirements                   | <input type="checkbox"/> Personnel shelters   |
| <input type="checkbox"/> Area of refuge requirements in case of catastrophe | <input type="checkbox"/> Egress   |
| <input type="checkbox"/> Safety and alarm requirements                      | <input type="checkbox"/> Public address requirements (mass notification requirements)       |
| <input type="checkbox"/> Fire detection and/or suppression requirements     | <input type="checkbox"/> Data or communications protection in case of disaster or emergency |
| <input type="checkbox"/> Eye wash stations                                  | <input type="checkbox"/> Fall hazard protection   |
| <input type="checkbox"/> Safety showers                                     | <input type="checkbox"/> Gas hazard detection   |
| <input type="checkbox"/> Deluge requirements and foam                       | <input type="checkbox"/> Noise abatement  |
| <input type="checkbox"/> Fume hoods   | <input type="checkbox"/> Other  |
| <input type="checkbox"/> Handling of hazardous materials                    |   |
| <input type="checkbox"/> Isolation facilities                               |   |
| <input type="checkbox"/> Sterile environments                               |   |

### **F7. Constructability Analysis**

A structured process is in place for constructability analysis. CII defines constructability as, “the optimum use of construction knowledge and experience in planning, design, procurement, and field operations to achieve overall project objectives. Maximum benefits occur when people with construction knowledge and experience become involved at the very beginning of the project.” Provisions have been made to provide this on an ongoing basis. This process includes examining design options that minimize construction costs while maintaining standards of safety, security, quality, and schedule. This process should be initiated in the front end planning process during concept or detailed scope definition. Elements of constructability during front end planning include:

- |   |  |
|---|--|
| <input type="checkbox"/> Constructability program in existence                              | <input type="checkbox"/> Developing site layouts for efficient construction                              |
| <input type="checkbox"/> Construction knowledge/experience used in project planning         | <input type="checkbox"/> Early identification of project team participants for constructability analysis |
| <input type="checkbox"/> Early construction involvement in contracting strategy development | <input type="checkbox"/> Usage of advanced information technology  |
| <input type="checkbox"/> Developing a construction-sensitive project schedule               | <input type="checkbox"/> Other   |
| <input type="checkbox"/> Considering major construction methods in basic design approaches  |  |

### **F8. Technological Sophistication**

The requirements for intelligent or special building systems should be evaluated. Identify new technology or development efforts, including software development requirements. Examples of these systems may include:

- |  |  |
|--|--|
| <input type="checkbox"/> Video conferencing                      | <input type="checkbox"/> “Smart” heating or air conditioning |
| <input type="checkbox"/> Internet connections                    | <input type="checkbox"/> Intercommunication systems          |
| <input type="checkbox"/> Advanced audio/visual (A/V) connections | <input type="checkbox"/> Security systems                    |
| <input type="checkbox"/> Personnel sensing                       | <input type="checkbox"/> Communication systems               |
| <input type="checkbox"/> Computer docking stations               | <input type="checkbox"/> Conveyance systems                  |
|  | <input type="checkbox"/> Other                               |

## G. EQUIPMENT

### G1. Equipment List

Project-specific equipment should be defined and listed. (Note: Building systems equipment is addressed in elements F4 - Mechanical Design and F5 - Electrical Design.) In situations where owners are furnishing equipment, the equipment should be properly defined and purchased. The list should define items such as:

- Process
- Medical
- Food service/vending
- Trash disposal
- Distributed control systems
- Material handling
- Existing sources and characteristics of equipment
- Relative sizes
- Weights
- Location
- Capacities
- Materials of construction
- Insulation and painting requirements
- Equipment related access
- Vendor, model, and serial number once identified
- Equipment delivery time, if known
- Operations and equipment that will need to function to provide continuing operations in a secure mode
- Other

Training requirements have been defined and responsibility established. Training has been identified in areas such as:

- Control systems
- Information systems and technology
- Equipment operation
- Maintenance of systems
- Training materials and equipment (e.g., manuals, simulations)
- Safety
- Other

**G2. Equipment Location Drawings**

Equipment location/arrangement drawings identify the specific location of each item of equipment in a project. These drawings should identify items such as:

- Plan and elevation views of equipment and platforms
- Location of equipment rooms
- Physical support requirement (e.g., installation bolt patterns)
- Coordinates or location of all major equipment
- Major equipment positioned to allow for maintainability
- Other

**G3. Equipment Utility Requirements**

This evaluation should consist of a tabulated list of utility requirements for all major equipment items such as:

- Power and/or utility requirements
- Flow diagrams
- Design temperature and pressure
- Diversity of use
- Gas
- Water
- Other

## SECTION III: EXECUTION APPROACH

### H. PROCURMENT STRATEGY

#### H1. Identify Long-lead/Critical Equipment and Materials

Identify engineered equipment and material items with lead times that will impact the design for receipt of supplier information or impact the construction schedule with long delivery times.

#### H2. Procurement Procedures and Plans

Procurement procedures and plans include specific guidelines, special requirements, or methodologies for accomplishing the purchasing, expediting, and delivery of equipment and materials required for the project. Evaluation criteria may include:

- |  |  |
|--|--|
| <input type="checkbox"/> Who will perform procurement?   | <input type="checkbox"/> Definition of shipping/liability responsibility for Government Furnished Equipment (GFE)  |
| <input type="checkbox"/> Listing of approved vendors, if applicable                            | <input type="checkbox"/> Definition of procurement status reporting requirements                                   |
| <input type="checkbox"/> Government or contractor purchase orders                              | <input type="checkbox"/> Additional/special Government accounting requirements                                     |
| <input type="checkbox"/> Reimbursement terms and conditions                                    | <input type="checkbox"/> Definition of spare parts requirements  |
| <input type="checkbox"/> Guidelines for supplier alliances, single source, or competitive bids | <input type="checkbox"/> Local regulations   |
| <input type="checkbox"/> Guidelines for engineering/construction contracts                     | <input type="checkbox"/> Storage   |
| <input type="checkbox"/> Responsibility for Government purchased items, including:             | <input type="checkbox"/> Operating manual requirements and training  |
| <input type="checkbox"/> Financial   | <input type="checkbox"/> Restricted distribution of construction documents for security and anti-terrorism reasons |
| <input type="checkbox"/> Shop inspection   |  |
| <input type="checkbox"/> Expediting  |  |
| <input type="checkbox"/> Definition of source inspection requirements and responsibilities     | <input type="checkbox"/> Other   |

## **J. DELIVERABLES**

### **J1. CADD/Model Requirements**

Computer Aided Drafting and Design (CADD) requirements should be defined.

Evaluation criteria should include:

- Application software preference (e.g., 2D or 3D CADD/GIS/BIM, application service provider (ASP)), including licensing requirements
- Configuration and administration of servers and systems documentation defined
- For 3D CADD, go/no-go on walk-through simulation for operation's checks, interference checks, construction planning and scheduling
- Government/Customer standard symbols and details
- Handling of life cycle facility data including asset information, models, and electronic documents
- Information technology infrastructure to support electronic modeling systems, including uninterruptible power systems (UPS) and disaster recovery
- Security and auditing requirements defined
- Physical model requirements
- Other

**J2. Documentation/Deliverables**

Documentation and deliverables required during project execution should be defined. If electronic media are to be used, format and application packages should be outlined. The following items may be included in a list of deliverables:

- Drawings and specifications
- Project correspondence
- Permits
- Maintenance and operating information/startup procedures
- Facility keys, keying schedules, and access codes
- Project data books (quantity, format, contents, and completion date)
- Equipment folders (quantity, format, contents, and completions date)
- Design calculations (quantity, format, contents, and completion date)
- Spare parts and maintenance stock (special forms)
- Procuring documents/contract documents
- Record (as-built) documents
- Quality assurance documents
- Project signage
- Guarantees/warranties
- Inspection documents
- Certificates of inspection
- Shop drawings and samples
- Bonds
- Distribution matrix
- Other

## K. PROJECT CONTROL

### K1. Project Quality Assurance and Control

Quality assurance and quality control procedures need to be established. Responsibility for approvals needs to be developed. Electronic media requirements should be outlined.

These issues may include:

- |  |  |
|--|--|
| <input type="checkbox"/> Responsibility during design and construction | <input type="checkbox"/> Reviewing changes and modifications   |
| <input type="checkbox"/> Testing of materials and workmanship          | <input type="checkbox"/> Communication documents (e.g., Requests for Information, Requests for Qualifications) |
| <input type="checkbox"/> Submittals and shop drawing approach          | <input type="checkbox"/> Commissioning tests   |
| <input type="checkbox"/> Inspection reporting requirements             | <input type="checkbox"/> Lessons-learned feedback  |
| <input type="checkbox"/> Progress photos                               | <input type="checkbox"/> Other   |

### K2. Project Cost Control

Procedures for controlling project cost need to be outlined and responsibility assigned. Electronic media requirements should be identified. These may include cost control requirements such as:

- |   |  |
|---|--|
| <input type="checkbox"/> Financial (Government/regulatory)        | <input type="checkbox"/> Cost code scheme/strategy   |
| <input type="checkbox"/> Phasing or area sub-accounting           | <input type="checkbox"/> Costs for each project phase  |
| <input type="checkbox"/> Report requirements                      | <input type="checkbox"/> Periodic control check estimates  |
| <input type="checkbox"/> Payment schedules and procedures         | <input type="checkbox"/> Change order management procedure, including scope control and interface with information systems |
| <input type="checkbox"/> Cash flow projections/draw down analysis | <input type="checkbox"/> Other   |

### **K3. Project Schedule Control**

The project schedule is created to show progress and ensure that the project is completed on time. The schedule is necessary for design and construction of the building. A schedule format should be decided on at the beginning of the project. Typical items included in a project schedule are listed below:

- Milestones
- Required submissions and/or approvals (Project Management Software)
- Required documentation/responsible party
- Baseline vs. progress to date
- Long-lead or critical pacing equipment delivery
- Critical path activities (Project Management Software)
- Contingency or “float time”
- Permitting or regulatory approvals
- Activation and commissioning
- Liquidated damages
- Unusual schedule considerations
- The owner must also identify how special project issues will be scheduled.  
These items may include:
  - Selection, procurement, and installation of equipment
  - Design of interior spaces (including furniture and accessory selection)
  - Stages of the project that must be handled differently than the rest of the project
  - Tie-ins, service interruptions, and road closure
- Other

#### **K4. Risk Management**

Major project risks need to be identified, quantified, and management actions taken to mitigate problems developed. Pertinent elements may include:

- |  |  |
|--|--|
| <input type="checkbox"/> Design risks  | <input type="checkbox"/> Inflation                   |
| <input type="checkbox"/> Expertise   | <input type="checkbox"/> Scope growth                |
| <input type="checkbox"/> Experience  | <input type="checkbox"/> Management risks            |
| <input type="checkbox"/> Work load   | <input type="checkbox"/> Availability of designers   |
| <input type="checkbox"/> Teamwork orientation                                      | <input type="checkbox"/> Critical quality issues     |
| <input type="checkbox"/> Communication   | <input type="checkbox"/> Bidders                     |
| <input type="checkbox"/> Integration and coordination                              | <input type="checkbox"/> Human error                 |
| <input type="checkbox"/> Construction risks  | <input type="checkbox"/> Cost and schedule estimates |
| <input type="checkbox"/> Availability of craft labor and<br>construction materials | <input type="checkbox"/> Timely decisions            |
| <input type="checkbox"/> Weather   | <input type="checkbox"/> Team chemistry              |
| <input type="checkbox"/> Differing/unforeseen/difficult site<br>conditions         | <input type="checkbox"/> Funding considerations      |
| <input type="checkbox"/> Long-lead item delays                                     | <input type="checkbox"/> Security                    |
| <input type="checkbox"/> Strikes   | <input type="checkbox"/> Political/local climate     |
|  | <input type="checkbox"/> Mission requirement change  |
|  | <input type="checkbox"/> Other                       |

#### **K5. Safety Procedures**

Safety procedures and responsibilities must be identified for design consideration and construction. Safety issues to be addressed may include:

- |  |  |
|--|--|
| <input type="checkbox"/> Hazardous material handling             | <input type="checkbox"/> Pre-task planning                         |
| <input type="checkbox"/> Interaction with the public             | <input type="checkbox"/> Safety orientation and planning           |
| <input type="checkbox"/> Working at elevations/fall<br>hazards   | <input type="checkbox"/> Safety incentives                         |
| <input type="checkbox"/> Evacuation plans and<br>procedures      | <input type="checkbox"/> Security clearance/background<br>checks   |
| <input type="checkbox"/> Drug testing                            | <input type="checkbox"/> Other special or unusual safety<br>issues |
| <input type="checkbox"/> First aid stations                      |  |
| <input type="checkbox"/> Accident reporting and<br>investigation |  |

## L. PROJECT EXECUTION PLAN

### L1. Project Organization

The project team should be identified including roles, responsibilities, and authority.

Items to consider include:

- |   |   |
|---|---|
| <input type="checkbox"/> Core team members                          | <input type="checkbox"/> Communication channels                 |
| <input type="checkbox"/> Project manager assigned                   | <input type="checkbox"/> Organization chart                     |
| <input type="checkbox"/> Project proponent                          | <input type="checkbox"/> Approval                               |
| <input type="checkbox"/> Working relationships between participants | <input type="checkbox"/> responsibilities/responsibility matrix |
|   | <input type="checkbox"/> Other                                  |

### L2. Government Approval Requirements

All documents that require owner approval should be clearly defined. These may include:

- |   |   |
|---|---|
| <input type="checkbox"/> Milestone for drawing approval by phase                          | <input type="checkbox"/> Types of drawings/specifications                             |
| <input type="checkbox"/> Comment  | <input type="checkbox"/> Purchase documents/general conditions and contract documents |
| <input type="checkbox"/> Approval   | <input type="checkbox"/> Data sheets  |
| <input type="checkbox"/> Bid issues (public or private)                                   | <input type="checkbox"/> Inquiries  |
| <input type="checkbox"/> Construction   | <input type="checkbox"/> Bid tabulations  |
| <input type="checkbox"/> Durations of approval cycle compatible with schedule             | <input type="checkbox"/> Purchase orders  |
| <input type="checkbox"/> Individual(s) responsible for reconciling comments before return | <input type="checkbox"/> Supplier information   |
|   | <input type="checkbox"/> Other  |

### L3. Project Delivery Method

The methods of project design and construction delivery, including fee structure should be identified. Issues to consider include:

- Government performed activities
- Designer and constructor qualified selection process
- Selected methods (e.g., design/build, CM at risk, competitive sealed proposal, bridging, design-bid-build)
- Contracting strategies (e.g., lump sum, cost-plus)
- Design/build scope package considerations
- Other

### L4. Design/Construction Plan and Approach (PMP)

This is a documented plan identifying the specific approach to be used in designing and constructing the project. It should include items such as:

- Responsibility matrix
- Subcontracting strategy
- Work week plan/schedule
- Organizational structure
- Work Breakdown Structure (WBS)
- Construction sequencing of events
- Site logistics plan
- Safety requirements/program
- Identification of critical activities that have potential impact on facilities (i.e., existing facilities, crane usage, utility shut downs and tie-ins, testing)
- Acquisition strategy
- Communication plan
- Quality assurance/quality control (QA/QC) plan
- Design and approvals sequencing of events
- Equipment procurement and staging
- Contractor meeting/reporting schedule
- Partnering or strategic alliances
- Alternative dispute resolution
- Furnishings, equipment, and built-ins responsibility
- Other

**L5. Substantial Completion Requirements**

Substantial Completion (SC) is the point in time when the building is ready to be occupied. The following may need to be addressed:

- Specific requirements for SC responsibilities developed and documented
- Warranty, permitting, and insurance considerations
- Commissioning
- Technology start-up support on-site, including information technology and systems
- Equipment/systems startup and testing
- Occupancy phasing
- Final Code inspection
- Beneficial Occupancy
- Calibration
- Verification
- Documentation
- Training requirements for all systems
- Acceptance
- Landscape requirements
- Punchlist completion plan and schedule
- Substantial completion certificate
- Other