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Section 1 – General Requirements

- 1.1. Contractor shall be responsible for the professional quality and technical accuracy of all studies, reports, projections, designs, drawings, specifications, and other services furnished by the Contractor as well as coordination with all studies, reports, and other information provided by Ball Aerospace.
- 1.2. All design documents shall conform to Ball Aerospace Facilities BIM Standard and all applicable sections of the Facilities Standards & Guidelines (FSGs).
- 1.3. During each phase, the Contractor shall attend, take part in, and when indicated, conduct meetings, site visits, and workshops.
- 1.4. The Contractor shall provide to the Owner hard copies and/or electronic copies as agreed upon with Ball Aerospace Project Manager.

Section 2 – Site Evaluation / Project Feasibility Study

- 2.1. General
 - 2.1.1. Contractor shall prepare, as applicable to the Owner’s development objectives, a site evaluation and project feasibility report, conceptual drawings, and rough order of magnitude (ROM) cost estimates for all sites and options associated with the study.
- 2.2. Report
 - 2.2.1. Prepare a report based on the Contractor’s research and examination of applicable design criteria. The report may incorporate written or graphic materials, and shall include:
 - 2.2.1.1. Executive summary.



- 2.2.1.2. Documentation of the methodology used to conduct the study.
- 2.2.1.3. The Owner's development objectives.
- 2.2.1.4. Relevant facts upon which the report is based.
- 2.2.1.5. Comparisons regarding multiple sites and/or design options, as applicable.
- 2.2.1.6. Cost estimates for each site location or design option, as applicable.
- 2.2.1.7. Conclusions and recommendations.
- 2.2.2. Contents of the report shall consider the following criteria in relation to the Owner's development objectives for the building and/or project site.
 - 2.2.2.1. Site Evaluation: Documentation of on-site observations; assessment of the physical characteristics of the site and adjacent construction; Assessment of the codes, ordinances, and regulations that impact the Owner's development objectives; Assessment of utilities available to the site; Assessment of access, circulation, parking, and potential security risks for the site.
 - 2.2.2.2. Environmental Requirements: Environmental requirements that may apply to the Owner's development objectives for the site, such as the need for environmental impact statements, assessments, documentation, testing, or monitoring.
 - 2.2.2.3. Site Context: Physical characteristics and context of areas immediately surrounding the site, including existing land uses, utility easements, proposed development, and public transportation. If applicable, prepare an inventory of buildings and other features that have been identified by local, state, or federal authorities as historic, or that may have historic significance.
 - 2.2.2.4. Building and Adjacent Construction Evaluation: Conduct an evaluation based on visual observation and as-built documentation of construction adjacent to the proposed site(s). The evaluation shall summarize: The building's existing uses; Elements or components of the buildings that do not comply with applicable codes and regulations; The building's predominant materials and their conditions; The building's structural systems and their conditions; The building's mechanical, electrical, fire suppression and process utility systems and their conditions; Impacts on egress and life safety; Potentially hazardous or toxic substances in the building.

2.3. Conceptual Drawings

- 2.3.1. Prepare conceptual development drawings based on the Owner's development objectives. The drawings shall show as appropriate, land use, building placement, project area of work, access and circulation of users, utilities, and development phasing.

2.4. Cost estimate

- 2.4.1. Based on the conceptual drawings and other information summarized in the report, prepare an estimate of the cost of the work for the development of the project.



Section 3 – Schematic Design

3.1. Architectural

- 3.1.1. Scaled floor plans showing overall refined dimensions, based on coordination of technical consultant(s) input. Update room-by-room tabulation of all net usable floor areas and a summary of gross floor area, showing any net changes from prior phase. Also, provide typical layouts of major equipment or operational layout.
- 3.1.2. Exterior elevations and sections in sufficient detail to demonstrate design concept indicating location and size of fenestration.
- 3.1.3. As applicable, identify proposed roof system, deck, insulation system and drainage technique.
- 3.1.4. Identify minimum finish requirements, including ceiling, floors, walls, doors, windows, and types of hardware.
- 3.1.5. Identify code requirements, include occupancy classification(s) and type of construction.

3.2. Structural

- 3.2.1. New Layout structural systems with dimensions and floor elevations. Identify structural systems (including pre-cast, structural steel with composite deck, structural steel bar joists); with preliminary sizing identified.
- 3.2.2. Identify foundation systems (including fill requirements, piles, caissons, spread footings); with preliminary sizing identified.

3.3. Mechanical

- 3.3.1. Evaluate and confirm the load requirements of all equipment and systems, the impact of those on existing facilities, and the requirements to increase these loads to accommodate the increase.
- 3.3.2. Calculate block heating, ventilation, and cooling loads including skin versus internal loading.
- 3.3.3. Select a minimum of two (2) HVAC systems that appear compatible with loading conditions for subsequent life cycle costing.
- 3.3.4. Show selected system on drawings as follows:
 - 3.3.4.1. Single line drawing(s) of all mechanical equipment spaces, ductwork and pipe chases.
 - 3.3.4.2. Location and preliminary sizing of all major equipment and duct work in allocated spaces
 - 3.3.4.3. Schematic piping.
 - 3.3.4.4. Temperature control zoning.
- 3.3.5. Provide design criteria to include the intent bases of design for the projects.

3.4. Electrical

- 3.4.1. Evaluate and confirm the load requirements of all equipment and systems, the impact of those on existing facilities, and the requirements to increase these loads to accommodate the increase.



- 3.4.2. Calculate overall approximate electrical loads.
- 3.4.3. Identify proposed electrical system for service, power, lighting, low voltage and communication loads, including proposed or planned additional buildings or other facilities on the Project site.
- 3.4.4. Show selected system(s) on drawings as follows:
 - 3.4.4.1. Single line drawing(s) showing major distribution system.
 - 3.4.4.2. Location and preliminary sizing of all major electrical systems and components including:
 - 3.4.4.2.1. Load centers.
 - 3.4.4.2.2. Main panels.
 - 3.4.4.2.3. Switch gear.
 - 3.4.4.3. Temperature control zoning.

3.5. Civil

- 3.5.1. Develop on and off-site utility systems such as sewer, water, storm drain, firewater lines and fire hydrants.
- 3.5.2. Identify surface improvements including walkways and terraces directly associated with building facilities, parking (with ADA and Electric Vehicle spaces identified for building needs), preliminary finish grades and drainage.
- 3.5.3. Coordinate finish floor elevations with architectural site plan.
- 3.5.4. Quantify stormwater mitigations, identifying possible locations, sizes, and methods, in surrounding landscape.

3.6. Specifications

- 3.6.1. Prepare outline specifications of proposed architectural, structural, mechanical and electrical materials, systems, and equipment and their criteria and quality standards.

Section 4 – Design Development

4.1. Architectural

- 4.1.1. Scaled, dimensioned floor plans with final room locations including all openings.
- 4.1.2. Minimum 1/4" scale building sections showing dimensional relationships, materials and component relationships.
- 4.1.3. Identification of all fixed equipment to be installed in contract.
- 4.1.4. Site plan completely drawn with beginning notes and dimensions including grading and paving.
- 4.1.5. Preliminary development of details and large scale blow-ups.
- 4.1.6. Legend showing all symbols used on drawings.
- 4.1.7. Floor plans identifying all fixed and major movable equipment and furniture.
- 4.1.8. Typical reflected ceiling development including ceiling grid and heights for each ceiling to be used, showing:



- 4.1.8.1. Lighting fixtures
- 4.1.8.2. Ceiling registers or diffusers.
- 4.1.8.3. Access panels.

4.2. Structural

- 4.2.1. Structural drawing with all major members located and sized.
- 4.2.2. Establish final building and floor elevations.
- 4.2.3. Preliminary specifications.
- 4.2.4. Identify foundation requirement (including fill requirement, piles) with associated soil pressure, water table and seismic center.

4.3. Mechanical

- 4.3.1. Heating and cooling load calculations as required and major duct or pipe runs sized to interface with structural.
- 4.3.2. Major mechanical equipment should be scheduled indicating size and capacity.
- 4.3.3. Ductwork and piping should be substantially located and sized.
- 4.3.4. Devices in ceiling should be located.
- 4.3.5. Legend showing all symbols used on drawings.
- 4.3.6. Control Systems to be identified.
- 4.3.7. Further evaluation and confirmation of the load requirements of all equipment and systems, the impact of those on existing facilities, and the requirements to increase these loads to accommodate the increase.

4.4. Electrical

- 4.4.1. All lighting fixtures should be located and scheduled showing all types and quantities of fixtures to be used, including proposed lighting levels for each usable space.
- 4.4.2. All major electrical equipment should be scheduled indicating size and capacity.
- 4.4.3. Complete electrical distribution including a one-line diagram indicating final location of switchboards, communications, controls (high and low voltage), motor control centers, panels, transformers and emergency generators, if required. Low voltage system includes fire alarm system, security system, clock and public address system, voice data system, telecom/technology system and audio-visual components.
- 4.4.4. Legend showing all symbols used on drawings.
- 4.4.5. Further evaluation and confirmation of the load requirements of all equipment and systems, the impact of those on existing facilities, and the requirements to increase these loads to accommodate the increase.

4.5. Civil

- 4.5.1. Further refinement of Schematic Design Phase development of on and off-site utility systems for sewer, electrical, water, storm drain and fire water. Includes, without limitation, pipe sizes, materials, invert elevation location and installation details.



- 4.5.2. Further refinement of Schematic Design Phase terraces, walkways, parking and storm drainage improvements.

4.6. Specifications

- 4.6.1. Further developed Outline Specifications from all applicable design disciplines indicating quality level and manufacture.

Section 5 – Progress Construction Documents (50% / 75%)

5.1. Architectural

- 5.1.1. Site plan developed to show building location, and major site elements.
- 5.1.2. Elevations (exterior and interior), sections and floor plans corrected to reflect design development review comments.
- 5.1.3. Architectural details and large blow-ups started.
- 5.1.4. Well-developed finish, door, and hardware schedules.
- 5.1.5. Fixed equipment details and identification started.
- 5.1.6. Reflected ceiling plans coordinated with floor plans and mechanical and electrical systems.

5.2. Structural

- 5.2.1. Structural floor plans and sections with detailing well advanced.
- 5.2.2. Structural footing and foundation plans, floor and roof framing plans with detailing well advanced.
- 5.2.3. Completed cover sheet with general notes, symbols and legends.

5.3. Mechanical

- 5.3.1. HVAC and piping distribution plans, sections, and detailing well advanced.
- 5.3.2. Mechanical calculations virtually completed with all piping and ductwork sized.
- 5.3.3. Large scale mechanical details started.
- 5.3.4. Mechanical schedule for equipment substantially developed.

5.4. Electrical

- 5.4.1. Lighting, power, signal, and communication plans showing all switching and controls. Fixture schedule and lighting details development started.
- 5.4.2. Distribution information on all power consuming equipment; lighting and device branch wiring development well started.
- 5.4.3. All electrical equipment schedules started.
- 5.4.4. Special system components approximately located on plans.
- 5.4.5. Complete design of low voltage system. Low voltage system includes fire alarm system, security system, clock and public address system, voice data system, telecom/technology system and audio-visual components.

5.5. Civil



- 5.5.1. All site plans, site utilities, parking, walkway, and roadway systems updated to reflect update revisions from Design Development Phase Documents, including all topographical and major site elements and existing/proposed contour lines.
- 5.5.2. Site utility plans started.

5.6. Specifications

- 5.6.1. More than fifty percent (50%) complete development and preparation of technical specifications from all disciplines describing materials, systems and equipment, workmanship, quality and performance criteria required for the project.
- 5.6.2. Specifications shall be in CSI format.

Section 6 – Construction Documents (100%)

6.1. Architectural

- 6.1.1. Completed site plan.
- 6.1.2. Completed floor plans, elevations, and sections.
- 6.1.3. Architectural details and large blow-ups completed.
- 6.1.4. Finish, door, and hardware schedules completed, including all details.
- 6.1.5. Fixed equipment details and identification completed.
- 6.1.6. Reflected ceiling plans completed.

6.2. Structural

- 6.2.1. Structural floor plans and sections with detailing completed.
- 6.2.2. Structural calculations completed.

6.3. Mechanical

- 6.3.1. Completed HVAC and piping distribution plans, sections, and details.
- 6.3.2. Large scale mechanical details complete.
- 6.3.3. Mechanical schedules for equipment completed.
- 6.3.4. Complete energy conservation calculations and report.

6.4. Electrical

- 6.4.1. Lighting, power, signal, and communication plans showing all switching and controls. Fixture schedule and lighting details completed.
- 6.4.2. Distribution information on all power consuming equipment, including lighting, power, signal and communication device(s) branch wiring completed.
- 6.4.3. All electrical equipment schedules completed.
- 6.4.4. Special system components plans completed.
- 6.4.5. Electrical load calculations completed.

6.5. Civil

- 6.5.1. All site plans, site utilities, parking and roadway systems completed.



6.6. Specifications

- 6.6.1. Complete development and preparation of technical specifications describing materials, systems and equipment, workmanship, quality and performance criteria required for the construction of the project.
- 6.6.2. Specifications shall be in CSI format.

Section 7 – Conformed Documents

- 7.1. The Conformed Documents stage shall be for the purpose of the Contractor to incorporate all regulatory agencies' comments into the drawings and specifications. All changes made by the Contractor during this stage shall be at no additional cost to the Owner.
- 7.2. The final Conformed Documents shall be delivered to the Owner upon completion and shall then form the Bid Documents, which shall consist of the following:
 - 7.2.1. Drawings: As requested by Ball Aerospace PM, hard copies and/or electronic copies complete with Contractors and sub-consultant's stamp and signature.
 - 7.2.2. Specifications: As requested by Ball Aerospace PM, hard copies and/or electronic copies complete with Contractors and sub-consultant's stamp and signature. Original word-processed technical specification sections on reproducible masters shall also be included.



Supplemental Document Information

The following resource documents should be referenced for execution of the standards and guidelines described above.

Document Number	Document Title

Revision Log

Revision	Release Date	Description of Changes
0	1/3/2022	Initial Release
1	4/11/2022	Added criteria for Site Evaluation and Project Feasibility/Study Services