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|  General Services Department Architecture & Engineering Division | | Project Manager's Manual | |
| | | PROJECT MANAGER'S OVERVIEW | |
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PROJECT MANAGER'S MANUAL OVERVIEW

The General Services Department, A&E Division Project Manager's Manual is intended to standardize the requirements and expectations of everyone involved in building design/construction projects. The Project Manager's Manual is to be used with the City of Tucson A&E Standards as an aid to A&E Project Managers and Design Consultants. The Project Manager's manual sections are to ensure that City projects are monitored, reported and implemented in a standard manner as well as for P.M.'s and others to have a clear understanding of project standards and preferences for design and construction. Sections of the P.M. Manual and Standards can also be used to accommodate the requirements of all the procurement contract delivery methods. The P.M. Manual and Standards also will be a valuable source of information to the customers receiving the services of the A&E Division. In summary, the General Services Department intends that the Project Manager's Manual and Standards serve as a resource for all engaged in City of Tucson vertical construction projects

The P.M. Manual and Standards establish preferences and procedures for the design and construction of The General Services Department, A&E Division building construction projects. The P.M. Manual establishes A&E's Project Manager's expectations of consultants, such as: expected deliveries and distribution, owners' preferences, maintenance preferences, and preferred methods and materials. However, these Standards are not to be considered a contract document. The P.M. Manual imposes no obligations or requirements on architects, engineers and contractors. The P.M. Manual must never be used as a substitute or supplement to the specifications and other contract requirements.

The General Services Department, A&E Division Project Manager's Manual and Standards is a "living" document. Sections are updated and modified frequently. The P.M. Manual contains many references to other publications and documents in order to minimize any repetition of information found in other publications. A record copy of this manual will not be filed at the beginning of each project. If any item becomes a point of contention, the designer and/or project manager should request an updated version of that item. Where a change or modifications to this P.M. Manual is proposed, submit comprehensive explanatory data in an electronic format to Michael Reece, A&E Division's Project Manager for review. The A&E Division will review the proposed change and make a decision whether to incorporate the revision.

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| | | ARCHITECTURAL MASTER PLAN PHASE | |
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The Consultant is to prepare the following documentation for this phase of the work to include but not be limited to:

- A. Facts: Facts are documented to describe present aspects of the proposed site. They are intended to answer the question: What is known about the site? Facts should include but not be limited to:
- Site survey
 - Site size
 - Adjacent uses
 - Slope and grades
 - Vehicular Access
 - Pedestrian Access
 - Sun Path
 - Water, sewer and gas lines
 - Power, telephone, cable and data lines
 - Zoning Analysis
 - Archeological Report
 - Hydrology Report
 - Geotechnical Investigation
 - Environmental Analysis and Report
 - Traffic Access Analysis
 - On - site Traffic Analysis
 - Vegetation
 - Public Transportation
- B. Needs: To be based upon the previously approved Architectural Design Program.
- C. Concepts: To be based upon a combination of the Facts, Needs and Budget. Develop several key alternatives for review and approval by the planning committee. Special considerations, as applicable:
- Components by size, type and description;
 - Alternative approaches to project resolution;

- Impact on surrounding neighborhood--architectural compatibility, traffic patterns, noise and light levels, visual impact;
 - Site evaluation--existing site, traffic/parking; zoning/legal restrictions, future site enhancements; agricultural assessment;
 - Hazardous material evaluation;
 - ADA requirements;
 - Environmental impact (including Greenhouse Gas Emissions Estimates);
 - Energy conservation (should include specific concepts which must be analyzed on a life-cycle cost basis);
- D. Construction phasing.
- E. Phasing of the entire project with appropriate scope and budget for each phase.
- F. Recommended Priority for Phasing and Master Plan Concept.
- G. Cost Summary.

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Operations and Maintenance Manuals – Electronic submissions of the O&M’s are required. One hard copy of the O&M’s is also to be provided. Break the O&M’s down by trade and put in 2” binders. Minimum information required for each piece of equipment: Warranty Information, recommended preventative maintenance schedule, spare parts lists, operating instructions, troubleshooting information schematic drawings of equipment (electrical, mechanical, hydraulic, pneumatic), paint manufacturer codes and colors by location any software information such as licenses, and product keys to software and any special tools if needed for maintenance.

Electronic submission of plans and specifications is required in addition to hardcopy submission as detailed scope of services or contract.

Temporary Utilities – The general contractor is responsible for temporary utility connections. The tie-in points to existing must be approved by the City. The cost of utilities is on a project by project basis. Typically for new construction projects the contractor is responsible for paying the cost of utilities and for renovations to existing facilities, the utility costs are typically paid by the City.


Project Schedules – Contractor and consultants shall provide to the project manager a schedule prepared on MS Project or similar program. The contractor’s schedules shall show all major elements required in the construction of the project including, but not limited to: time for shop drawing preparation and owner and consultant review, identification of the critical path and identified float at the beginning and end of each task. The consultant, general contractor and the City’s project manager should all sign-off and agree to the approved construction schedule.

Project Submittals and Shop Drawings, – Comply with expected turn-around times and expedite items in the critical path as noted on the Project Schedule.

RFI’s, Supplemental Instructions, and Invoices,-. Reviews should be expeditious as possible. RFI’s and Supplemental Instructions are not for means and methods.

Product Substitutions – the City expects our design consultants to specify materials, equipment and products that can be competitively bid and to provide an acceptable list of those items that meet the intent of the specifications. The listing of acceptable materials, equipment and products should be the acceptable list and we will not accept substitutions after the time of bid or when the contract price is determined. Contractors must request pre-approval of substitutes during the bid or

pricing negotiations. Where the designer feels approval equals should be allowed this must be approved but the A&E Project Manager.

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ARCHITECTURAL EVALUATION AND PLANNING SERVICES

The Architect shall provide a preliminary evaluation using information furnished by A&E and the using agency, such as the using agency's program and schedule requirements and budget for the cost of the work. The Architect shall review such information to ascertain that it is consistent with the requirements of the project and shall notify A&E of any other information or consultant services that may be reasonably needed for the project.

The Architect shall provide a preliminary evaluation of the using agency's site for the project based on the information provided by the agency or A&E of site conditions, and the agency's program, schedule and budget for the cost of the work. In addition, the following elements are to be developed by the Architect in conjunction with using agency and included in the Evaluation and Planning Documents.

- **Goals:** Goals are to be developed in conjunction with a planning committee and are intended to answer the question: What does the City of Tucson want to accomplish with the project.
- **Project Description:** Describe the history and scope of work.
- **Service function of the using agency.**
- **Space Criteria Sheets:** Each space/room shall be identified and the form filled out. An example is provided. Included should be sketches for typical offices, workspaces, special work areas, equipment and casework requirements.
- **Summary Area Tabulation:** A summary of all spaces in net square feet with appropriate gross area multipliers for walls, building systems and circulation.
- **Adjacency Diagram**
- **Establish energy and maintenance goals**
- **Establish site environment goals**
- **Cost Summary (+/- 5% accuracy)**
- **List of interview participants**



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- Deliverables: The final document is to be reproduced in black and white, bound in 8 1/2 x 11 format, and ten (10) copies (unless otherwise noted in the contract) distributed to the City of Tucson Architecture & Engineering office, which will in turn distribute copies to each of the user departments and agencies. Also, include one (1) set of black and white reproducible plans. The cover sheets on plans and booklets should include the project name and address, date, and approval signatures for each department user group and Architecture & Engineering Division.


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SCHEMATIC DESIGN PHASE

The Architect/Design Consultant shall provide Schematic Design Documents based on the mutually agreed-upon program, schedule, and budget for the Cost of the Work. The documents shall establish the conceptual design (including options) of the Project illustrating the scale and relationship of the Project components as well as options for systems and major components. The design consultant will analyze each option and provide a recommendation to the City. The Schematic Design Documents shall include a conceptual site plan, if appropriate, and preliminary building plans, sections and elevations. At the Architect's option (unless specified elsewhere), the Schematic Design Documents may include study models, perspective sketches, electronic modeling or combinations of these media. Preliminary selections of major building systems and construction materials shall be noted on the drawings or described in writing. The Schematic Design Documents shall include but shall not be limited to:


1. Overall Project Schedule including breakdown of major project activities. This includes but is not limited to major construction activities (including any planned construction phasing), project design phases with owner review cycles indicated. Construction manager to provide the construction schedule for CM@R projects.
2. Construction cost estimate with breakdown by major construction disciplines (+/-20% accuracy). Construction manager to provide the construction cost estimate for CM@R projects. The design consultant is also expected to provide a cost estimate by major discipline for comparison to the CM@R's estimate.
3. Assist PM in developing/revising the overall project budget
4. Sitework (shown on site plans or in narrative form as appropriate and agreed to by the Project Manager).
 - a. Paving, sidewalk, curb, fence, parking, and other site improvements.
 - b. Drainage, including a discussion of potential of the project to effect surrounding properties (watershed), deterioration, detention / retention locations. A narrative conceptualizing the drainage issues is expected. Plans to show conceptual detention/retention pond sizes and locations.
 - c. Utility location site plans showing where utilities enter the site and the routing for gas, water, electrical, telephone, sewer, cable, and data.
 - d. Initiate and document contact with City of Tucson Zoning and Planning to obtain preliminary requirements.

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- e. Landscape concept.
- f. Cultural Resources - Per Administrative Directives from the City Manager's office, a cultural resource review is required for all Capital Projects. This review is to occur prior to the design of any building projects requiring excavations of any kind. There is a Cultural Resource Clearance request form that needs to be filled out, go to (<http://intranet/ad/1-07-7.pdf>). Also, you may call the City of Tucson Dept. of Urban Planning and Design; 520-791-4505 for any assistance you may need. The City's PM is responsible for ensuring the Cultural Resources Review is completed. The design consultant is expected to report on the results and their potential project impacts in the SD report.
- g. Surrounding Neighborhood – Consider the use of the proposed facility and the possible impact the facility may have on the immediate neighborhood from such changes as increased noise, increased traffic, and other quality of life impacts.
- h. Survey - Verify and document property easements and constraints. Note any potential problems. The City's PM is responsible for ensuring the survey is completed by the Architect/Consultant or by others. TEP:(transformer location) get legal description and show on survey if there is an existing transformer and electric service easement. Note new service easement is typically provided during construction and should go through City Real Estate Department to obtain the TEP easement. City's PM is to ensure survey is performed to our requirements. The survey may be under the design consultant's scope or by others.
- i. Water Harvesting - Provide a narrative description as to how the project will meet the Tucson code requirements for water harvesting as described in Appendix A of the City of Tucson Water Harvesting Manual, which is available at <http://www.dot.ci.tucson.az.us/stormwater/downloads/2006WaterHarvesting.pdf> . Consultant is also to provide a cost/benefit analysis of additional water harvesting opportunities. The cost/benefit analysis is not intended to be a detailed study but should provide enough information for the City to make informed decisions whether or not to pursue further water harvesting opportunities on the project.

5. Code Analysis

Note: ADA Compliance - City facilities, as public buildings, shall be designed, constructed and altered for accessibility and use by the disabled. In this connection the Department of Justice 28 CFR Part 36 ADA Standards for Accessible Design, Revised July 1, 1994 (ADAAG) shall determine the design criteria to be used for the design of these facilities to ensure accessibility and compliance.

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A PDF Format copy can be downloaded from the DOJ site:

<http://www.usdoj.gov/crt/ada/adahom1.htm>

The specific design criteria applicable to provisions for the disabled shall be incorporated in the Architectural Design Program document for the facility.

The DOJ standards stipulate minimums and maximums as guidelines. The City of Tucson uses these guidelines as the minimum or maximum allowable standards within which we prefer to provide the most comfortable design to provide universal access.

DSD shall be consulted early and as the project proceeds to specifically review ADA issues/requirements. Added 6-16-2010vh

6. Exterior wall elevations with major materials identified
7. Typical building sections with major material, building and structural systems identified
8. Architectural Floor plans, all levels
 - Partition layout of all spaces.
 - Accurate toilet room, elevator and stair layouts. Furniture and movable equipment layouts, for ALL spaces.
9. Room finish concept for all major spaces
10. Plumbing Systems Plan
 - a. Fixture locations.
 - b. Equipment locations.
 - c. Narrative describing systems
11. Fire Protection System Narrative
 - a. Provide system description.
 - b. Provide system description of all special use Fire Protection Systems (Mission critical computer rooms, e.g.)
12. Mechanical System Plan & Narrative



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- a. Equipment locations and types.
- b. Supply, return, and exhaust duct one-line diagram.
- c. Controls concept. (narrative)
- d. Establish life cycle analysis of energy consuming equipment and options (conceptual).
- e. HVAC load and sizing calculations shall be provided indicating the size of the major mechanical system components (narrative).

13. Power Distribution

Power distribution equipment locations. (Utility source, service entrance gear, distribution and lighting panels, “first pass” amperages and voltages of each. At SD’s, square foot basis is acceptable.)

14. Lighting

- a. Lighting fixture concept and layout shown for the majority of interior and exterior lit areas.
- b. Special requirements noted.
- c. Life cycle cost analysis, for the purpose of analyzing lighting system options (conceptual).

15. Roofing

Roofing systems with a minimum slope of ½” per foot (slopes less than ½”per foot is not permitted per City standard):

Provide a roof as described in the standards that has a Full System Guarantee with no dollar limit including all roof penetrations. Guarantee shall include the roof system from the deck up. Damage repair as part of the guarantee shall include replacement of wet insulation and damaged decking.

Roofing systems for slopes greater than 3” per foot shall rely on the manufacture’s best warranties

16. Communication and alarm systems description and floor area space requirements

- a. Identification and scope. (narrative)
- b. Data, CATV, audio video, and phone drops location. (narrative)
- c. Communications equipment room(s) sized and located on floor plans.



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- d. Special communication needs, wireless, antenna mast, fire alert system, mobile data computer, Internet Protocol Media Network (IPMN) and Information Transport Systems (ITS). (narrative)
- e. Where large meeting rooms, classrooms, and auditoriums are part of the project, SD is when an Acoustic Engineer and/or AV specialists should begin providing information and design criteria. rev4/22/08

17. Outline Specifications

- a. Table of contents for technical sections.
- b. All sections project specific.
- c. Written description of recommended additive alternates and special construction scheduling requirements (coordinated with the CM@R contractor if applicable).

18. LEED and the Sustainable Energy Standard – as required by Mayor and Council Resolution each new facility or renovation project of over 5,000 sq. ft. must meet the LEED Silver Criteria and offset a minimum of 5% of its energy needs thru the use of solar energy. In addition, for new construction, the project must earn a combined 7 points in EA1 and EA2 and for existing buildings 9 points combined in EA1 and EA2.

- a. Show all available LEED points in tabular form which indicates what points are probable yes's, no's and maybe's. Provide an order of magnitude estimate as appropriate for the cost or credit available for obtaining each point and the responsible party (City, design consultant, sub-consultants or general contractor).
- b. Include a determination of how the project will meet the requirement for offset of its overall energy needs with solar energy in the form of daylighting, electric generation or water heating.
- c. Building Energy Modeling.
 - i. For buildings over 5,000 square feet an hourly simulation shall be performed by a Certified Energy Manager (CEM by the Association of Energy Engineers) or licensed engineer to evaluate the best energy strategies. Software and methodology to be used for the evaluation shall be approved by the City prior to use. At this phase of the design the model is to be utilized for determining strategies to be recommended for achieving the project goals for energy efficiency and meeting the LEED criteria. It is understood that much of the


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data for an accurate model is not available at this time. The LEED submission will require a detailed model which must be performed at a later time.

- ii. For buildings less than 5,000 square feet the prescriptive method may be used as described in Table 702.2(30) of the IECC for climatic zone 14a.
 - iii. Energy cost shall be provided by the City of Tucson at the request of the consultant.
19. Basis of Design Narrative - Provide narrative descriptions of major systems including; functionality, features, limitations, design assumptions and design parameters. Design assumptions shall also be indicated such as # of occupants, indoor and outdoor HVAC design parameters, maintained foot-candles, hours of operation, roof design loads, etc. It is expected that these narratives and design assumptions will be updated and included in each subsequent design submittal in a report format. The basis of design documents will ultimately be included in the project as-built or record set of plans for ease of future access on full size sheets. It is anticipated that the basis of design sheets will simply be reproduced onto full size plan sheets numbered, titled and index with the plans when the consultant turns over the record set of plans to the City. The basis of design is not expected to be included in the plans submitted for permits or construction bidding
20. Third Party Commissioning - new construction or major renovation project of over 5,000 sq.ft. must be third party commissioned. The City PM will hire the 3rd party commissioning agent for the project at the completion of the SD project phase. The City PM is responsible for ensuring the budget reflects the cost for commissioning and directing the commissioning agent throughout the project. The design consultant needs to fully cooperate and coordinate with the commissioning agent. The SD report should note the project will be commissioned.

All of the above information is to be reproduced in color, bound and ten (10) copies (unless otherwise noted in the contract) distributed to the City of Tucson Architecture & Engineering office, which will in turn distribute copies to each of the user departments and agencies. Also, include one (1) set of black and white reproducible plans. The cover sheets on plans and booklets should include the project name and address, date and approval signatures for each department user group and Architecture & Engineering Division.

Any comments received from previous reviews shall be included in the SD submittal with consultant responses. Responses should be coordinated with the City's project manager.

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Major changes in scope should be discussed and agreed to by the PM.

The A/E Project Manager will distribute the SD documents to appropriate interested parties for their review and comment. Review timeline is typically two weeks. The PM shall collect and review all comments. The PM will distribute comments to the consultant for their review and recommendations.

There is typically an SD review meeting held at the end of the SD review period. This meeting shall be attended by all design disciplines at the discretion of the PM. Appropriate City of Tucson staff will be in attendance. The A&E Project Manager reserves the right for final approval of format and content.



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DESIGN DEVELOPMENT PHASE

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DESIGN DEVELOPMENT PHASE

The Design Consultant shall provide Design Development Documents based on the approved Schematic Design Documents and updated budget for the Project. The Design Development Documents shall illustrate and describe the refinement of the design of the Project, establishing the scope, relationships, forms and size and appearance of the Project by means of plans, sections and elevations, typical construction details, and equipment layouts. The Design Development Documents shall include specifications that identify major materials and systems and establish in general their quality levels.

The goal at the completion of the DD phase is for the City to have a clear understanding of the overall project cost and project duration. Major design decisions should have been made at the completion of the DD phase and the scheme for securing required LEED points should be well established.

The design consultant shall submit with the DD submission responses to all SD comments. The City PM is responsible for reviewing each comment and consultants response.

While the DD section is built around a typical design, bid, build project, the same items generally need to be provided for alternative methods although the responsible party might change (for example in D,B,B, the designer typically provides the cost estimate while under a construction manager at risk project the general contractor generally provides the construction cost estimate). The City PM is ultimately responsible for ensuring the required tasks are completed and for coordinating the scopes of work.

The design development drawings and report shall include but shall not be limited to:

1. Overall detailed Project Schedule (Design & Construction). The City PM is to work with the design consultant to establish the overall project schedule. The overall schedule as well as the construction schedule shall show the critical path as well as probable 'float'. The construction schedule shall be presented to the City PM in MS Project format electronically and hardcopy. The City PM is to produce the overall project schedule in MS Project format.
2. Construction cost estimate with detailed breakdown by major construction disciplines (+/-10% accuracy). Construction Manager shall provide the construction cost estimate for

CM@R projects. If requested, the design consultant is also expected to provide a cost estimate by major discipline for comparison to the CM@R's estimate. Consultant is to provide a comprehensive cost estimate and work with the City PM to establish the overall project budget

3. Provide HVAC, lighting and electric load calculations, and develop estimates of the cost of operating and maintaining the facilities designed under this Contract. Assumptions shall be clearly noted. The estimated operation and maintenance costs are to be projected for each of the thirty (30) consecutive fiscal years following acceptance of the facilities by the City. Each system shall be evaluated for operating cost. The evaluation will take into consideration replacement. All economic cost evaluations shall be taken as simple payback with the yearly owning cost averaged over the period. The ASHRAE HVAC Applications Handbook 1999 shall be used as a reference and chapter 35 in particular for service life estimates. All calculations shall be submitted and will become the property of The City. The following operating cost estimates are to be provided:
 - a. Estimate of annual utility costs for gas, electrical, water, and sewer.
 - b. Estimate of annual maintenance costs.*
 - c. Suggested additive or deductive alternatives with estimated costs.*
 - * (City Project Manager is to provide copies to the Maintenance Superintendents and Energy Manager.)

3. Site Plan
 - a. Site description.
 - b. Scope of work.
 - c. Conceptual grading plan.
 - d. List references to all pertinent codes and regulations.
 - e. List design assumptions.
 - f. Conceptual design of paving, sidewalks, curbs, fences, gates, parking, roads, and other site improvements showing conceptual horizontal and vertical control data.
 - g. Drainage, detention / retention ponds and water harvesting concept, refer to: <http://dot.ci.tucson.az.us/stormwater/downloads/2006WaterHarvesting.pdf> . Include the latest revision stating that rainwater harvesting systems capture 100% of the rooftop rainfall over a 72 hr period.
 - h. Utility design plans for gas, water, electrical, telephone, sewer, TV cable, Fiber Optic, Microwave, Wireless and other data properly identified and labeled (private, public ...).
 - i. Communications UG conduits, conduit size and location with 2500# traceable muletape, innerduct, maxcell, tracer wire. Include trench details with traceable foil I.D. tape that lays in the trench 18" above the conduit.
 - j. Ensure there is to be no gravel in mechanical yards, use asphalt or concrete paving.
4. Landscape Plan (City Project Manager to review with City Urban Landscaping for conformance with Xeroscape requirements.)

- a. Identified Vegetation
 - b. Conceptual Landscape Plan
 - c. Conceptual Irrigation Plan
5. Code Analysis with preliminary approval by Development Services and other authority having jurisdictions. Provide a list of all the necessary permits with probable costs and estimated time durations for securing these permits.
 6. Foundation Plans
 - a. Foundation system definition with conceptual foundation layout and sections.
 - b. Slabs on grade showing estimated thicknesses and other pertinent details needed for the final design.
 7. Structural framing Plans
 - a. Roof structure with typical sections and details
 - b. Structural framing system, plans, sections, elevations and details.
 - c. Structural roof masts and independent towers for communications.
 8. Exterior wall elevations, and sections defining all materials, supports, bracing, ties, reinforcing etc.
 9. Typical interior bearing or firewalls sections defining thickness, supporting concept, etc.
 10. Typical architectural roofing and flashing details
 11. Floor plans, all levels and roofs
 - a. Partition type identifications.
 - b. Smoke and fire compartmentation.
 - c. Built-ins and fixed equipment shown and noted.
 - d. 1/4" scale furniture and movable equipment layouts, for ALL spaces.
 12. Reflected Ceiling Plan
 - a. Lights diffusers, grilles, sprinkler heads and unusual conditions.
 13. Room finish, door schedules, and a narrative of the door hardware functions for all areas/spaces, include wall texture, surfacing material, and paint types and color.
 14. Fixed equipment schedule, locations, and service requirements.
 15. Plumbing Systems
 - a. Fixture schedule, locations.
 - b. Equipment schedule, locations.
 - c. Water piping, locations (sizes for pipes larger than 1").
 - d. Waste piping, locations (sizes for pipes larger than 4").
 - e. Catalog sheets of exposed fixtures.
 - f. Water pressure data and calculations.


- g Show maintenance access to vital pieces of plumbing equipment.
16. Roof drainage system, locations, and key sizes
 17. Fire Protection Systems
 - a. Provide system performance design criteria.
 18. Mechanical Systems
 - a. Equipment schedule, locations, sizes, types, load information.
 - b. Equipment filter sizes and quantities with adequate maintenance clearances.
 - c. Supply, return, and exhaust duct layout.
 - d. Catalog sheets of exposed fixtures.
 - e. Control concepts and sequence of operation for major equipment.
 - f. Reestablish life cycle analysis of energy saving equipment and options from the Schematic Phase.
 - g. Provide separate storage room for 1 year supply of filters (shall also include space for 1 year supply of lamps & fuses for electrical. Provide for “attic stock” ceiling tile storage on site).
 - h. Show maintenance access to vital pieces of mechanical equipment.
 19. HVAC piping, locations, and sizes for pipes larger than 1”
 20. Power Distribution
 - a. Panel locations and schedules.
 - b. Terminal distribution to equipment and receptacles.
 - c. Motor control schedules.
 - d. Line diagram.
 - e. Load calculations.
 - f. Fault calculations.
 21. Lighting
 - a. Final fixture and switch locations and branch circuits.
 - b. Catalog sheets.
 - c. power density calculations for each space
 - d. lighting fixture schedule
 22. Communication and alarm systems description and floor area space requirements
 - a. Identification and scope.
 - b. Data and phone drops located.
 - c. Communications equipment room(s) sized and located on floor plans.
 - d. Communication room wall elevations and rack locations. Include ladder-ways, electrical layout on the racks, and fire retardant A/C ¾” plywood location.
 - e. Show grounding buss on everything with a one line diagram from the main electrical equipment. .

- f. Number all tele/data information outlets.
 - g. Show conduits, size and location.
 - h. Redundant cooling
 - i. Emergency lighting
- 23 Special systems
- a. Final layout and specification.
 - b. Catalog sheets.
 - c. Where large meeting rooms, classrooms, and auditoriums are part of the project, DD is when ceiling heights and design is established with an Acoustic Engineer. AV control location are located and AV layout is established with an AV specialist.
- 24 Description of proposed additive alternates and cost estimates for each
- 25 Materials and color boards
- 26 Specifications
- a. Table of contents for technical sections.
 - b. All sections project specific.
 - c. Written descriptions of all options, allowances, unit prices, and special construction scheduling requirements.
- 27 Third Party Commissioning Agent (CA) – The City PM is responsible for ensuring the commissioning agent has been contracted and has reviewed the project basis of design and design documents. The design consultant is required to include the Construction Administrator’s review of the basis of design, SD comments, preliminary commissioning plan and preliminary commissioning specifications in the DD report. The CA will review and comment to the design consultant on the DD phase report. All systems to be commissioned will be identified and noted by the design consultant. Commissioning is to be performed to meet the requirements for the U.S.G.B.C. LEED enhanced commissioning credit EA 3.
28. LEED and the Sustainable Energy Standard – update required information from SD phase as needed. Working with the City PM the design consultant shall provide an estimate for achieving LEED. The estimated cost for LEED would include those items necessary for achieving LEED Silver over a baseline of a 2005 City standard building.
29. All of the above information is to be reproduced in black and white and ten (10) copies (unless otherwise noted in the contract) distributed to the City of Tucson Architecture & Engineering Office, which will in turn distribute copies to each of the user departments and agencies. The cover sheets on plans and booklets should include the project name and address, phase, list of alternates, date and approval signatures from each department

user group and Architecture & Engineering. Option: provide electronic submission of the above for DD review documents.

30. Written Documentation - All written documentation shall be submitted in electronic files in Microsoft Office format.

A&E reserves the right for final approval of format and content.

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CONSTRUCTION DOCUMENTS PHASE

The Architect shall provide Construction Documents based on the approved Design Development Documents and updated budget for the Cost of the Work. The Construction Documents shall set forth in detail the requirements for construction of the Project. The Construction Documents shall include Drawings and Specifications that establish in detail the quality levels of materials and systems required for the Project. The Architect shall assist A&E in establishing a list of prospective bidders or contractors. The Architect shall assist A&E in bid validation or proposal evaluation and determination of the successful bid or proposal, if any. The Construction Documents shall include but shall not be limited to:

1. Project Schedule
2. Construction cost estimate with area breakdowns (net and gross) and analysis.
 - a. List and description of proposed Additive alternates.
 - b. Reaffirm annual utility costs for gas, electrical, water, and sewer.
 - c. Reaffirm annual maintenance costs.
3. Site Plan
 - a. Detailed design of paving, sidewalks, curbs, fences, parking, roads, and other site improvements showing conceptual horizontal and vertical control data needed for construction.
 - b. Drainage, detention / retention ponds and all necessary details for water harvesting.
 - c. Utility design plans for gas, water, electrical, telephone, sewer, TV cable and other data properly identified. Sections shall clarify congested areas.
 - d. Detailed Landscape design plans.
 - e. Cut - fill estimated quantities with specified shrink factor.
 - f. No gravel in mechanical yards, use asphalt or concrete paving.
4. Foundation Plans
 - a. Definition of materials, allowable bearing pressures, and definition of any special conditions effecting the construction.



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- b. Foundation, sizes, reinforcement, construction joints etc.
 - c. Waterproofing details and energy code insulation installation details.
 - d. Slabs on grade showing thickness, joints, reinforcement etc.
5. Structural framing Plans
- a. Definition of codes, design loads, materials, and methods or programs used for the design.
 - b. Roof structure with typical sections and details
 - c. Framing plans, sections, elevations and details identifying all member sizes.
 - d. Complete connection details identifying No. of bolts or sizes of welds etc.
 - e. Fireproofing requirements (NFPA designation) and all necessary details.
 - f. Vibration isolation or other special details.
6. Exterior wall elevations, and sections identifying all materials, supports, bracing, ties, reinforcing etc.
7. Typical interior bearing or firewalls sections.
8. Floor plans, all levels and roofs
- a. Partition type identifications.
 - b. Smoke and fire compartmentation.
 - c. Built-ins and fixed equipment shown and noted.
 - d. 1/4" scale furniture and movable equipment layouts, for ALL spaces.
 - e. Evacuation plans (See example at the end of this document):
 11X17 in black metal picture frame with glass.
 White Background, black walls doors and fixtures, red arrows marking the direction of exit.
 Each plan shall be titled, dated and with a north arrow indicator.
 Identify central locations for evacuation.
 Each plan shall be printed as if facing wall where evacuation plan is mounted.
 Must include "you are here" with a dot indicating the current position.
 Must include, in "red", the word "EXIT" at each fire exit door(s).
9. Reflected Ceiling Plan



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- a. Lights diffusers, grilles, sprinkler heads and unusual conditions.
10. Room finish and door schedules for all areas/spaces
 11. Miscellaneous specialties and equipment schedule
 12. Fixed equipment schedule, locations, and service requirements
 13. Plumbing Systems
 - a. Fixture schedule, locations.
 - b. Equipment schedule, locations.
 - c. Water piping, locations (sizes for pipes larger than 1”).
 - d. Waste piping, locations (sizes for pipes larger than 4”).
 - e. Water pressure data and calculations.
 14. Roof drainage system, locations, and key sizes
 15. Fire Protection Systems
 - a. Provide system performance design criteria.
 16. Mechanical Systems
 - a. Equipment schedule, locations, sizes, types, load information.
 - b. Equipment filter sizes and quantities with adequate maintenance clearances.
 - c. Supply, return, and exhaust duct layout.
 - d. Control system schematic diagrams, details, complete points list, catalog cuts, and control sequence of operation.
 - e. Detailed training and commissioning plans.
 - f. Provide separate storage room for 1 year supply of filters (shall also include space for 1 year supply of lamps for electrical).
 17. HVAC piping, locations, and sizes for pipes larger than 1”
 18. Power Distribution Diagram
 - a. Panel locations and schedules.



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- b. Terminal distribution to equipment and receptacles.
- c. Motor control schedules.
- d. Line diagram.
- e. Load calculations.
- f. Fault calculations.

19. Lighting

- a. Final fixture and switch locations and branch circuits.
- b. Catalog sheets.

20. Special systems

- a. Final layout and specification.
- b. Catalog sheets.

21. All disciplines are to be coordinated.

22. Project specifications (marked up for project)

23. Description of proposed options and cost estimates for each

24. Materials and color boards

25. Specifications

- a. All sections complete and edited project specific.
- b. Written descriptions of all options, allowances, unit prices, and special construction scheduling requirements.
- c. Table of contents for technical sections.
- d. Consultant to provide lists in specifications, on separate pages, a complete descriptions of :
 - Two year warranties by item and duration are standard (make a list of specified items that are other than the standard two year warranty)
 - O&M manuals (the Contractor is to provide 5 sets of O.& M. Manuals)
 - Special test
 - Special inspections



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- Close out items (documentation, test, certifications)
- Training (on which items and duration)
- Items that are to be returned to City of Tucson (where and when) with labels and tags.
- Extra material (items and quantities and where delivered to) with labels and tags
- Certifications
- Submittals to include manufacturers Warranty

26. Written Documentation

All written documentation shall be submitted in electronic files in Microsoft Office format, compatible with Windows NT.

A&E reserves the right for final approval of format and content.



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WORKSPACE STANDARDS

The Workspace Standards which follow are intended for programming, design and layout of workspaces commonly associated with administrative, clerical, managerial, technical, data entry and design personnel. Non standard spaces such as conference rooms, classrooms, storage, reception, and technical rooms should follow professional standards of practice. Refer to A&E Design Standards for further requirements during each phase of work.

As a point of reference, this information has been adapted from the April 1990, State of Arizona, Department of Administration Building System Space and Building Development Standards to fit the criteria of the City of Tucson, Division of Architecture & Engineering.

GOALS

- Equity in the quality of workspace for each level of employee throughout the City of Tucson.
- Ergonomic performance for all design configurations. Especially important is the selection of task chairs, computer set-up, keyboard adjustment, reach distances for transaction counters and worksurface.
- Modularity of layout based upon type of workspace.
- Uniformity and interchangeability of system components.
Planned flexibility for future layout changes.

MODULARITY

The space standards assume that the workspaces will follow a basic symmetrical grid. In new construction, a planning grid should be established that matches the building structural grid to the workspace grid. In existing construction the designer should work to establish a symmetrical grid to the maximum extent possible within the confines of the existing structure.

The guidelines are the same for both shared open areas and private offices. Private offices are to be configured with the same modular dimensions, computer setup and worksurfaces as the open spaces. The permanent walls are to be located to match the modular dimensions of the open areas. For future flexibility all components are to be interchangeable.

BUILDING GRID

With new building design, the entire departmental work area should be laid out on a standard workspace grid such as 4'x4', 6', 8' x 8' or 10', etc. Conference rooms, private offices, storage rooms and other enclosed spaces should be laid out to match this grid. Future addition or removal of permanent walls can then be accommodated with this grid.

MATERIALS

All panels, worksurfaces and storage components are to be finished with standard manufacturer materials. Custom finishes, fabrics and upholstery are not acceptable unless with the written approval of A&E.

AREA

The areas listed herein represent net useable square feet, unless noted otherwise, for each specific room type and do not include the required additional factors for departmental circulation and layout. Departmental layout area must be multiplied the net-to-gross square footage conversion factor that account for major fire corridors, vertical circulation, toilets, walls and engineering systems. The circulation and layout factor is added to the sum of the interior spaces itemized by department and division. For this application the factor varies between 15% and 21% depending upon the proportionate magnitude of the planned space. The appropriate factors for each component are displayed on the space requirements database forms.

APPLICATION

The material which follows explains the methodology for calculating and applying the standards to the needs of the occupants of the building or part thereof. Drawings of suggested office, workstation, conference room and reception layouts and form many types of furniture and equipment are provided at the end of this section.

PRIVATE OFFICES

Private offices are reserved for Department Heads, Assistant Department Heads and Division Administrators. Private offices for personnel below this level shall only be approved with written authorization by A&E. The assignment of private offices for other personnel shall only be considered when the job description requires an unusually high degree of privacy. In these areas, it has been assumed that the furniture is functionally appropriate and arranged for the convenience of the person using it. Private offices are enclosed by fullheight partition walls or partitions and are suitable for individuals requiring some degree of acoustical privacy.

OPEN or PARTITION WORKSTATIONS

In general office area, the duties inherent in the position determine the type of workstation assigned. Workstation which may be used by personnel in open areas include desks, chairs, side chairs, credenzas, and computers. The net square footage required for each station is determined by adding the physical area of the work surface to the working space required by the person

using the station. The space is then increased by one-half of the aisleway necessary to approach the workstation.

Although the height of workstation partitions will be determined by the space planner and the client, it is suggested that at least two or three partition heights be considered when the system manufacturer is selected. This will permit the interior planners and designers to exercise some discretion in assigning workstation partition heights and provide them flexibility to address the needs for privacy, storage and supervision of employees.

Every workstation shall be considered to have a computer unless noted otherwise.

CONFERENCE AND MEETING ROOMS

Enclosed conference rooms to seat 10 to 12 people should be provided for every 20 people. In addition, open breakout area to seat 4 to 6 should be provided for every 12 people. The size of spaces should be based on good professional standards. Special consideration should be given to requirements for Communication and Audio Visual. Smart screens may be appropriate for some rooms.

Install assistive listening devices for any new city meeting room with an occupant load of more than 50 or where an audio amplification system is installed. We should provide a minimum of 3 receivers. If the occupant load is 100 or more provide 5 receivers or 4% of the total seating, whichever is greater. Signage complying with 1106.16.2 of the UBC shall also be installed notifying citizens of the availability of the listening system.

TECHNOLOGY

Architecture & Engineering wishes to implement buildings incorporating the latest in planning and technology systems. This applies to furnishings, communication equipment (computers, telephone, fax, cad, etc.), energy management systems, engineering and architecture. Design of the core and shell is critical in achieving future planning flexibility, efficient operating costs, good space utilization, serviceability, ease of maintenance, security, comfort and image.

SITE ORIENTATION

Buildings shall be oriented to maximize potential views from within the site and towards the surrounding environs. Orient the structure to maximize the positive climate characteristics of the site and minimize adverse environmental impacts. The building envelope shall be designed to utilize passive solar design where applicable. (i.e. low E glazing shade south exposure, etc). The positive benefits of Arizona's abundant sunlight for natural daylighting of interior spaces.

Building Design Criteria

Building Configuration Requirements: Provide appropriate bay sizes, bay depths, distance from natural light, access to services so that the following definitions and requirements can be met.

Floor Sizes: Minimum floor sizes of 25,000 NSF for typical office and administrative, buildings. Other special floor size considerations might include:

Usable Space Depth: The structure shall be designed so that the depth of space from the exterior wall to the interior corridor wall (or other permanent wall) shall not be less than a nominal 30'-0" or more than a nominal 45'-0" unless there is an interior atrium or light well no greater than 45'-0" from any occupied space.

Proportion: Provide overall average building daylighting ratio (NSF of Occupied workspace, not including conference, storage and other support areas, divided by lineal feet of perimeter glass surface, not deducting for intervening perimeter columns less than 36" wide) of less than 60 (this is an expression of the average maximum depth of space from natural light). Buildings with a slenderness ratio of lower than 40 (NSF per lineal foot of glass) may be too narrow and not provide sufficient interior space to allow development of tenant support and special areas.

Distance From Natural Light: In all above grade space other than training and conference areas, that is considered NSF, no less than 90% of all space shall be within a distance of not more than 45 feet from natural light. This 45 feet is to be measured by occupant's line of site from their workspace to the light source. The natural light may be provided by:

Perimeter Perimeter glazing with unobstructed interior open space, not obstructed by full height partitioning nor full height glazing.

Atrium Glazing into an atrium area

Skylight By proximity to a skylight if on the top level of a building,

Distance to Services: No workstation or NSF will be enclosed private office and special area spaces bounded by partitions on all sides. These full height partitions generally will be located adjacent to or as extensions to core elements. In no instance should these full height spaces be placed directly adjacent to an atria space and only in the instance of some larger private offices should they be placed on the perimeter of a building. The placement of this full height space should not obstruct access to natural light from atriums or the perimeter. The building footprint and form should demonstrate how an average of 10% of the NSF can be placed in a location that does not create a corridor situation (for fire exiting purposes), nor does it obstruct access to natural light while at the same time not violating the above rules and performance criteria regarding distance from workstations to natural light.

Floor to Floor Height: Floor to Ceiling Clearance: The building's structure shall be designed so that the minimum ceiling height from finished floor to finished ceiling is 9'-0" on all office floors. Ceiling height shall be uniform throughout assignable space on each floor and shall be uniform on all floors above grade.

The base building installation of mechanical duct loops, sprinkler lines, bulk heads and any other items installed in the ceiling plenum spaces shall allow sufficient clearance for the tenant's ceiling-lighting system while maintaining the specified clear ceiling height throughout a minimum of 97% of all NSF. This allows 3% to be obstructed to lower the height to 8'-6" clear and/or to not allow a light fixture in that location, to accommodate transfer beams and mechanical ducts. Provide a minimum of 8-inches clear under all piping, ducts, conduits and structure so that all light fixtures can be relocated without obstructions. Utility lines installed above ceiling to be held as close as possible to upper level floor or roof structure.

Bay Size: The general interior space planning concept requires open bays without interior bearing walls within 45 feet of the perimeter building enclosure. Interior bearing walls shall be allowed only at core locations where the surround core elements (stair, elevator, mechanical and electrical shaft walls) or large tenant rooms.

Building Module: The open bay plan shall allow for the layout of office landscape type workstations and enclosed office/conference rooms on a repetitive module. Perimeter column spacing may range from 20'-0" minimum to 30'-0". Column spacing at the perimeter closer than 20' center to center shall not be allowed. Column and window mullion spacing shall accommodate office widths of 8', 12', 16' and 20'. Office and enclosed spaces located at the perimeter must be developed without requiring "jogs" in the wall to align with window mullions or column faces.

Maximum Height: The maximum height of the building shall be as allowed by the Tucson Land Use Code. All levels of the building shall be served by freight and centralized passenger elevators. At the main entrance there shall be a high bay space providing a centralized entrance with a two story volume, space allowing visual identification of lobbies, waiting areas, counters and major sub-division entrances at both the first and the second levels.

Exposed Roofs: Considering that a building may have a large footprint and be low-rise, it is likely that different levels of the building may be of different floor sizes. This creates the possibility of some lower level roofs being exposed from office space on upper levels. Extensive exposed roof areas are to be avoided. A combination of vertical visual barriers and window bulkhead heights on upper floors to obstruct the vision of undeveloped roof levels from a location that is 20 feet from the perimeter as observed by a person 6 feet tall should be used to prevent vision of an exposed roof. The line of vision of a person 6 feet tall standing 20 feet inside of the perimeter bulk head must not observe unfinished roof area above the bulkhead or below a 9'-0" ceiling height. Landscaping on terraces may NOT be employed to obscure the view.

Vertical Flow: A centralized ceremonial stairway or open stair is encouraged to interconnect the first two levels of the building. All stairways will be used for interfloor movement of personnel and thus must be appropriately designed to promote their use.

Central Areas: At a minimum, a central building support area must be provided which surrounds the central/vertical movement element, lobby, freight decks, and central services.

Within this area shall be located high volume and public oriented spaces including counters, waiting areas, information delivery areas, public information displays, training rooms, auditorium and centralized location of conference rooms. Centralized employee services, coffee stations and break areas, lounges, mail delivery stations and on-floor service centers will be located in this area.

Public Facilities: Adjacent to the elevators on all public levels in the building, there shall be public restrooms. All public restrooms shall be designed in accordance with all building codes and ADA requirements, however, the minimum size of public restrooms to be provided are:

Men's Room: The public men's room shall provide two water closets, two urinals and three lavatories.

Women's Room: The women's restroom shall provide three water closets and three lavatories.

Live loads: The minimum uniformly distributed live load for the general office floors shall be 75 pounds per square foot (PSF) unless otherwise restricted by code requirements. This does not include the weight of the raised floors where they may be installed. Additional loading requirements of 125 PSF shall be required adjacent to core walls and between core elements on typical office floors for bulk storage and filing rooms in a minimum of 10% of the NSF and applied only to full structural bays. It shall not be located where there is a raised floor.

Tolerances: Total surface tolerance in all public view locations (horizontal and vertical) shall be 1/4-inch maximum in 10' - 0" for exposed to public view locations, including structural flatwork to receive such floor finishes as carpet, resilient tile and furniture systems in general office areas. Comply with ACE 301.

Within any structural bay it is necessary to have a reasonably level floor to accommodate the installation of furniture systems. Excessive unlevelness within a bay can result in a lack of visual alignment of the tops of the furniture systems from one linkage or cluster to another. Generally furniture systems will be installed in clusters of six to ten workstations which could be anywhere from 24 to 42 feet in length and 16 feet in width.

The Owner will verify the degree of levelness before carpet tile and systems furniture are installed. Therefore, the result of the leveling (if required) cannot reduce the overall ceiling clearance height provided.

Window Area: A minimum of 90% of all general office areas shall be within 45 feet from a window or natural light of a minimum surface area of 10 sq. feet - this allows a maximum of 10% of above grade space to be more than 45' feet from natural light and essentially "without access" to natural light. This is where storage file, conference, equipment, and other enclosed space will be located.

Window Dimensions: Window mullion spacing, (or dimensions between unglazed perimeter construction materials), shall be a modular 4'-0" on center to allow for the placement of private

offices partitions that may vary between 8' - 0" and 20' - 0" in width in 4' increments. Partitions and open space panel systems located at the perimeter must be developed without requiring "jogs" in the wall to align with window mullions of column faces.

Perimeter windowsill heights shall be a minimum of 30-inches and a maximum of 33-inches AFF for minimum of 90% of the perimeter where there are windows. In the balance (10%) sill height may be anywhere from 3" AFF to clerestory height.

Window Treatments: Horizontal mini-blinds should be provided on all windows.

Security: Provide connections for future CCTV to a central security center. The security officer shall monitor all life safety alarms as well as elevator annunciation panels. Elevator access during off hours shall be monitored. Provide provisions for future cameras located at various, agreed upon locations which includes but are not limited to the loading dock for surveillance and monitoring of the roll-up door and loading dock parking entrances, building doors, upper level primary circulation, transit/landing and other selected locations after normal business hours. Installation of conduits and J boxes are included.

Stairs: Stairwells shall be used for movement of personnel from one floor to another during normal business hours with the availability of security and access control devices, designed into the base building, restricting exiting from the stairwell to floors other than ground level.

Stairs will be used by staff to go from floor to floor. Stair doors into tenant spaces shall be left in the open position, doors shall be double width on magnetic hold opens and close in the event of fire. This shall apply to all stairs serving tenant office space.

All surfaces in the stairwells shall be finished and designed to be attractive for regular use by building tenants as part of base building construction. Special consideration shall be given to sound attenuation in those stairwells.

Elevators: Elevator service must accommodate 12% of the building population above levels accessed from grade in the peak 5-minute period. Cycle time shall not exceed 28 seconds/loading capacity of 70% shall be assumed. Density above the first floor will average 160 NSF per person for this calculation. Calculation should assume that 70% of all staff below the main floor will use a stairway and that 50% of staff on the first level above the main floor will use a stairway. Assume one (1) freight elevator will remain in service for passengers during morning peak periods.

The finish in passenger elevators should include:

1. Floor: Durable carpet or natural stone to match lobby.
2. Walls: Hardwood, mirror, polished stainless steel.

3. Lighting: Soft, indirect, avoid bulbs being visible to users when looking up at numbers.

All elevators serving a given floor shall be located in the same elevator bank and visible from one waiting point. Consideration shall be given to an elevator core location that allows installation of additional elevators when building expands and maintain a future central elevator location convenient to all space.

Elevators in “banks” with openings facing another elevator bank shall not be closer together than 12 feet. Vestibule floor finish shall be similar to public lobby.

The building shall provide a minimum of one (1) elevator suitable for the movement of freight to all occupied floors of the building. One (1) freight elevator can be shared with building elevators to provide passenger movement capacity during peak operating hours.

The freight elevator shall be able to accommodate standard drywall 4’ x 10’ and other building materials moved on carts and stacked vertically. The freight elevator shall be deep enough and/or have a platform large enough to accommodate a 30” x 72” desk or piece of furniture moved horizontal on furniture dollies without tipping the desk on end.

A minimum platform size of 6’2” wide and 8’4” deep with a minimum clear height of 10’ and a minimum weight capacity of 4,500 pounds is desirable.

Provide front and/or rear opening doors to minimize freight movement and staging in public areas and elevator lobbies. Provide lock-out controls. The rear access door to the freight elevator shall be controlled by key or other electronic device. Access from the rear door of a combination passenger/freight elevator to any floor that the tenant occupies in total shall be restricted by electronic key card in the elevator car.

Core Area: Design of the core should provide for access of all rooms in the core from one or two sides at most, to eliminate the need for circulation around the entire core.

Toilet rooms:

Allocate facilities in accordance with code, local requirements and practice. In no instance, however shall toilet facilities be provided that do not support an average occupied floor of one person per 160 NSF and provisions for 44% male and 66% female occupancy. This 10% excess coverage allocation shall allow for staff distribution flexibility.

Restrooms shall be located along primary circulation paths and near other core elements (stairs). In no instance shall any workstation be more than 150 feet from the restroom entrance.

Vestibule design shall provide visual privacy without use of multiple doors. An alternative to providing a two door privacy vestibule at each toilet room location is to separate lavatories from water closets and urinals by a door, rendering the lavatory/mirror area as the vestibule.

Provide full-height tile on walls behind and adjacent to fixtures and on floor surfaces in toilet rooms.

Metal partitions shall be used throughout except in rooms with showers. Provide ceiling hung toilet partitions that are corrosion and tamper resistant. Wall mounted urinal screens shall match the partitions and be firmly braced to resist impact.

All toilet rooms shall have recessed paper towel dispensers and waste receptacles; mirrors shall be full height and a stainless steel shelf, minimum 8" deep above wash basins to accommodate books, purses, etc. Men's toilet rooms shall have rear wall mounted toilet seat cover and partition mounted roll toilet tissue dispensers. Women's toilet rooms shall have rear wall mounted toilet seat cover dispenser, partition mounted napkin disposal and toilet tissue dispenser, recessed feminine napkin-tampon vendors.

Water closets shall be wall-hung, flush valve type of vitrified china. Urinals shall be wall-hung, vitrified china with extended bowl, flush valve type. Lavatories shall be vitrified china wall mounted. All toilet rooms shall be provided with floor drains as required.

Janitor Closet

Each tenant floor shall be provided with one janitor closet or one per 25,000 GSF of larger single floor buildings. They should be centrally located or distributed on a primary circulation path, equipped with hot and cold running water and a drain that is part of the central core area, janitor receptors shall be floor mounted, and a hose bib mixing faucet shall be provided at each location. It shall have 10 feet of 24" deep floor to ceiling open shelving, an overhead light and one duplex electrical outlet. The closet shall provide 60 sf of open floor area. It is not included in NSF as it is a core element.

Electrical Closets:

As required by the overall building requirements.

Communication Closets:

These closets provide the interconnection between the Backbone Riser Facility and the Horizontal Distribution Facility. They shall be located at regular intervals around the core throughout each floor of the building and may also house any electronic equipment service the area, such as Local Area Network File Servers, fiber-to-electric bridge equipment, etc. Each closet shall contain approximately 150 square feet of floor space.

Each closet shall contain adequate wall and floor space for the mounting of backboards and installation of equipment cabinets and racks to contain wire termination equipment.

Security locks shall be provided on the doors(s) to this room.

Walls shall be constructed with a one-hour fire rating. A fire suppression system should be provided to this room.

The space shall be temperature and humidity controlled and contain sufficient 110 volt power outlets for connection of equipment to be located within.

Each closet shall serve no more than 20,000 square feet of building floor space.

The maximum distance between closets shall not exceed 350 feet.

Recycled Box and Paper Storage Room

Space shall be adjacent to the freight elevators for recycled papers and boxes to be taken to the holding area on a daily basis.

Public Telephone

Public telephones should be coin and credit card type. Provide a minimum of (3) three telephones adjacent to the primary Public lobby and at the public transit access area.

Water Coolers

Water coolers shall be recessed, wall hung, handicapped accessible. A minimum of one per general office floor or one with each restroom complex (whichever is greater) shall be provided.

Fire Extinguisher and Cabinet:

Fire extinguishers shall be the multi-purpose dry chemical type with UL rating. Cabinets shall be recessed with a flat steel door.

Interior Finishes:

Design attention shall be given to assure the compatibility of all component finishes in tenant and public space including exit signs, fire hose cabinets, and drinking fountains. Corridor walls shall have protective rails and corner guards.

Design, procurement and installation attention shall be given to the interior finishes and furnishings to ensure indoor air pollutant source control. Such finishes and furnishings shall be tested for pollutant emissions, at the Designer's/Builder's expense, prior to installation in the building. Products which do not meet the pollutant emission guideline or air quality standard set forth elsewhere in this document will not be procured nor installed.

Rated corridors required to connect all core penetrations and leading from one stairway to another shall be finished in accordance with building standards in a manner compatible with the design of the elevator lobbies.

Building Support:

Loading Dock

Bays: An appropriate facility shall be provided for the receipt of freight from step vans, straight body trucks and semi-trailers for all tenants.

Weather Protection: The facility shall provide weather protection for the movement of material from service vehicles to the building at truck dock height without utilizing ramps or steps.

Dock Leveler: This project shall provide a dock leveler or other direct access docking feature.

Dock Bumpers: Laminated neoprene with integrally welded steel frame at all non-leveler locations.

Truck Restraint Device: Provide at each truck bay one truck restraining device or equivalent.

Lighting: Provide lighting to load and unload trucks.

coiling doors: Provide motor operated coiling or vertical telescoping service doors at the loading dock and service vehicle entrance and exit.

Access: Material movement from trucks to the freight elevator vestibule shall be direct and unobstructed. There shall be direct access from the freight elevator without utilizing public lobby space for the movement of trash, janitorial and maintenance supplies.

Staging Area: The space required to move material from trucks to the freight elevator shall be appropriate in size for movement of building construction materials and standard office furniture. This space shall be made available to all tenants.

Exhaust from vehicles using the loading dock and its vicinity shall be vented in such a manner that it does not: (a) infiltrate the building through its envelope; nor (b) become entrained in the building air supply system.

Compactor and Dumpster

One compactor and a 40 cubic yard trash dumpster are to be located adjacent to the loading dock for general trash.

Microwave Transmission System: Verify if required.

Satellite Receiving System: Verify if required.

Window Washing Equipment

Provide motorized equipment capable of reaching exterior glass that is more than 22 feet from grade or provide keyed (but not operable by users without a key) windows. The equipment shall include hinged davit sockets with anchorage's, portable davit assemblies, work platform with restrain devices, hoists, wire ropes, electric power cable and safety ropes. All embedded metal shall be galvanized. It shall comply with all applicable code requirements. Provide a weather enclosure for storage.

Vending

A limited number of vending machines supplied by an outside service company will be provided in designated centralized area throughout the facility. Allow space and provide outlets for 18 machine capacity.

Emergency Generator and UPS

Verify if required. If required, provide mechanical space, pads, vertical shafts and provisions for a standby generator or UPS. Ample space shall be included for maintenance procedures.

Communications Service System:

This facility serves the building as the connection point between the inter-building communications distribution system and the inter-building communications distribution system. All incoming telephone and data circuits serving the building enter and terminate in this facility. The room might also contain any electronic components which serve all of the building, such as security and alarm systems. It should be located at the lowest level of the building.

Adequate wall and floor space shall be provided for the mounting of backboards and installation of equipment cabinets on racks to contain wire termination equipment consistent with the telephone company's and the users' requirements for voice and data systems. Wiring pathways with allowance for future growth shall be provided between this room and the Main communications Room. Also, allowance shall be made for future incoming service requirements to this room from outside the building.

For purposes of sizing the incoming telephone cable to the building, it shall be estimated that there will be one telephone per 100 s.f. of the office space. An additional 5% of this capacity shall be provided for dial access modem lines using voice-grade telephone service.

Allowance shall be made for a number of incoming leased data lines (20% of voice requirements) and additional fiber optic lines may be added in the future. Provide a minimum of 120 dial-in circuits and 500 data circuits.

The main Communications Room/network Support Room should have the following design features:

This room will contain large equipment serving the building, such as voice/data switching equipment, etc. provisions shall be made for the future installation of Private Branch Exchange

(PBX). Provide this space at a lower level of the building, adjacent to the computer room. This space is not part of NSF.

Provide adequate wall and floor space for the mounting of backboards and installation of equipment cabinets and racks to contain wire termination equipment. There shall be a minimum clear distance of 36" behind and in front of nay racks or cabinets installed in this room.

The main door to this room shall be a minimum 4'- 0" wide. Accessibility to the freight elevator is required to move large equipment in and out of the room. Security locks shall be provided on the door to this room.

Walls shall be constructed with a two-hour fire rating. A fire suppression system shall be provided to this room.

Wiring pathways with allowance for 50% future growth shall be provided from this room to the Backbone Riser Facility (ies).

The space shall be temperature and humidity controlled and also contain sufficient 110 volt and 208 volt power outlets as required for connection of equipment to be located within.

The backbone facility consists of the vertical and horizontal pathways between the Service Entrance Facility and Main Communications Room to all Communications Closets located throughout the building. Tray shall be suitable for fiber optic cable. Allowance for 50% future growth in the number of cabinets shall be included. Pathways for the backbone will be required to serve any computer located within the building.

Horizontal Distribution Facility.

This facility is comprised of the pathways between the Communications Closets and the individual workstations on the floor. Provide conduits or plenum rated cables to all outlets adjacent to or within systems furniture.

Care should be exercised in designing a cable tray layout for a ceiling distribution system to insure that sufficient cable tray space is available for future cabling needs and also that cable trays are conveniently located to columns to be used for the workstation drops.

The cable tray/ladder shall serve the extend up into the ceiling plenum and/or down into the ceiling plenum below and continue above primary paths/circulation to provide horizontal distribution around all core elements, to locations adjacent to all columns and to the location of pre-set electrical/communication boxes in the floor slab, and to distribute cabling to the perimeter of the floor where it is then distributed in wire manager, conduit, etc. along the baseboard for non-raised floor areas.

Indoor Air Quality:

An adequate building outdoor air supply which is protected (from pollutant sources, including the building's own exhaust, parking facilities, and outdoor smoking pavilion);

Adequate and effective fresh air delivery to occupants shall be provided.

Properly designed and implemented exhaust systems to service special areas, as well as the general office spaces. Such exhaust systems shall be designed for compatibility not only with air intake system(s), but also for compatibility with future development.

Strict pollutant source control, implemented by specification and testing of interior furnishings, construction materials and installation/construction procedures.

Design of the internal HVAC delivery systems shall incorporate the ability to redirect without great expense the internal air flows as occupancy and activity patterns change over the life of the building. The HVAC system shall be designed and balanced to deliver specified airflows to the occupant's working locations, taking into account any interference which may be created by workstations and other furnishings. Occupied stagnant air zones will not be allowed.



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FEE PROPOSAL

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| (Firm) | (Discipline) | PROGRAMMING LABOR | MASTER PLAN LABOR | NON-LABOR | TOTAL |
|--------|-----------------------------|-------------------|-------------------|-----------|-------|
| | Project Management | | | | |
| | Programming | | | | |
| | Design | | | | |
| | Cost Est. | | | | |
| | Structural | | | | |
| | Architectural | | | | |
| | Mechanical | | | | |
| | Electrical | | | | |
| | Civil | | | | |
| | Geotechnical | | | | |
| | Fueling Systms | | | | |
| | Landscape | | | | |
| | Communications (RCDD) | | | | |
| | Construction Administration | | | | |
| | Furnishings | | | | |
| | Graphics | | | | |
| | Aerial / Surveying | | | | |
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Description of Land Survey Requirements

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Project: _____ Date: _____

Architect: _____

1. Drawing Requirements:

- a. Drawing sheets shall be trim size _____ X _____ with left binding edge.
- b. Use scale best suited to utilize full drawing, include graphic scale. (Survey Drawing may be incorporated into contract documents for "information only".)
- c. Locate North at the top of the sheet, or _____
_____.
- d. Include legend of symbols and abbreviations used on the drawing(s).
- e. Spot elevations on paving or other hard surfaces to be the nearest .05' (or 1/2"), on other surfaces to the nearest .10' or (1"). If using aerial survey information, establish ground control data and possible error in aerial survey elevations.
- f. Boundary and topographic information, where both are required, shall be on the same drawing unless otherwise requested.
- g. State basis for use of local or national elevation datum and location of nearest permanent vertical geodetic benchmark. A permanent benchmark should be established on the site at a location suggested by the Architect for the benefit of the Owner and future reference.
- h. Furnish to the Owner one reproducible transparency and three prints of each drawing to the Architect. The Licensed Land Surveyor shall sign and seal each drawing and shall certify that to the best of the Surveyor's knowledge, information and belief all information thereon is true and accurately shown.

2. Land (Boundary) Survey: (Check Required Task)



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- _____ a. Show boundary lines, giving length and bearing (including reference or basis) on each straight line; interior angles; radius, point of tangency and length of curved lines. Where no monument exists, set permanent iron pin (monument) or other suitable permanent monument at property corners; drive pin into ground adequately to prevent movement, mark with wood stake; state on the drawing(s) whether corners were found or set and describe each. If ground monument differs from surveyor's boundary survey, set new monument pin and state offset.
- _____ b. Confirm or furnish the legal description which conforms to the Record Title Boundaries. Prior to making this survey, insofar as possible, acquire data including, but not limited to, deed maps, certificates or abstracts of title, section lines and other boundary line locations in the vicinity.
- _____ c. Give area in square feet if less than one acre, in acres (to .001 acre) if over an acre.
- _____ d. Note identity, jurisdiction and width of adjoining streets and highways, noting right-of- ways, width and type of pavement. Identify pertinent landmarks. Include platted, but not constructed, streets, highways, etc.
- _____ e. Plot location of all structures on the property. Plot the structures which are on adjacent property within 20 feet of subject property. Dimension perimeters in _____ feet and inches to nearest 1/2"; _____ feet and decimals to .05'. State the character and number of stories. Dimension to property lines and/or other buildings. vacant property, including adjacent parcels, shall be noted "Vacant".
- _____ f. Show encroachments, including building projections either way across property lines, easements, right-of-ways, set backs, etc.
- _____ g. Describe fences and walls including retaining walls. Identify party walls and locate them with respect to property lines. Show all walks, steps, ramps, planters, etc.
- _____ h. Show recorded or otherwise known easements and right-of-ways; state the owner of record of each.
- _____ i. Note anticipated street widenings.



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- _____ j. Show individual lot lines and lot block numbers; show street numbers of buildings, if available.
- _____ k. Show zoning of property; if more than one zone, show extent of each. Show zoning of adjacent property and property across the street(s) or highway(s).
- _____ l. Show building lines and set back requirements, if any.
- _____ m. Provide names of abutting property owners.
- _____ n. Reconcile or explain any discrepancies between the survey and the recorded legal description.
- _____ o. Provide coordinate benchmark to permit future coordinate baselines to be established. Benchmark to be based on County or local coordinate system. (Can be combined with task 3.1).

3. Topographical Survey Requirements:

- _____ a. Provide minimum of one permanent benchmark on site for each four acres; description and elevation to be nearest .01'. (Maximum of four).
- _____ b. Contours to be at _____ foot intervals. Extend contours approximately twenty feet beyond property line or to the extent that direction of off-site storm drainage can be determined.
- _____ c. Spot elevations at each intersection of a _____ foot square grid covering the property.
- _____ d. Spot elevations at street intersections and at _____ feet on center on curb, sidewalk and edge of paving, including far side of paving. If elevations vary from established grades, state established grades also. Identify abrupt changes in grade, swales and ditches, with direction of flow indicated.
- _____ e. Plot location of structures, above and below ground, man-made (e.g. paved areas) and natural features; all floor elevations and elevations at each entrance of buildings on the property.



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- _____ f. Location, size, depth and pressure of water and gas mains, central steam and other utilities including, but not limited to, buried tanks and septic field serving, or on, the property.
- _____ g. Location of fire hydrants available to the property and the size of the main serving each.
- _____ h. Location and characteristics of power and communication systems above and below grade.
- _____ i. Location, size, depth and direction of flow of sanitary sewers, storm drains and culverts serving, or on, the property; locations and rim elevations of catch basins and manholes, and inverts of pipe at each.
- _____ j. Mean elevation of water in any excavation, well or nearby body of water.
- _____ k. Indicate flood plain limits and its' characteristics.
- _____ l. Location of test and/or soil borings, if evident, and grade elevation of the top of holes.
- _____ m. Location of flagged, or tagged, specimen trees or shrubs; locate to the center within 6" tolerance.
- _____ n. Outline only perimeter of thickly wooded area.
- _____ o. Name of operating authority of each utility serving site.

4. Special Requirements: (if any, on separate sheet)



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PROJECT SCHEDULE

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PROJECT SCHEDULE

Project Schedule: The consultant is required to provide a Microsoft Project schedule in PDF format to include:

- A. Events that will satisfy each of the project phases through two-year warranty
- B. Dates each event will start and be completed
- C. Elements which will hinder normal progress
- D. Submit updates with each change. Show actual progress plotted against the original baseline.
- E. Submit updates with each change showing actual progress plotted against the original baseline.
- F. Furnish five copies of original work schedule, along with electronic format, within 10 days after written Notice to Proceed is issued by City, and thereafter five copies of any approved revisions.

Please include in the schedule the Architecture/Engineering Division's Three (3) Step Review process (per City Project Manager's option):

1. Technical Review Meeting with the Consultant Team and each of our respective staff to coordinate the requirements and concept of the building.
2. Plan review at 100% Design Development at which time each system is reviewed with written comments to the consultant.
3. Plan review at 100% Construction Documents with written comments to the consultant.

The Architecture/Engineering Division reserves the right for final approval of format and content.



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SPACE CRITERIA

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SPACE CRITERIA

GENERAL INFORMATION:

Workplace Name:
Reference Person:
Telephone Number:

Net Area (S.F.):
Number of Occupants:
Date:

Source(s) of Information:

Please give a simple generic description of the purpose and function of this space:

Does this workplace need to be located directly adjacent to or near another space?

If so, please list in order of priority (1 highest):

| <u>Priority</u> | <u>Space Number</u> | <u>Workspace Name</u> | <u>Directly Adjacent</u> | <u>Nearby</u> |
|-----------------|---------------------|-----------------------|--------------------------|---------------|
|-----------------|---------------------|-----------------------|--------------------------|---------------|

ARCHITECTURAL REQUIREMENTS:

Architectural Finishes

| | | | |
|---|-----------------------|-----------|------------------|
| Floor: | Base: | | |
| Walls: | | | |
| Ceiling: | Ceiling Height: | | |
| Openings: | | | |
| Doors: | Type: | Material: | Glazing: |
| Hardware Considerations: | | | |
| Windows: | Window Type Required: | | Window Covering: |
| Critical dimensional requirements, eg. door height, room width: | | | |



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- Is vehicular access from outside of building required?
- Are unusual structural loads anticipated?
- Are raised “computer floors” required?
- Are there other special architectural considerations?
- Sound Considerations?

Area Layout

Provide a rough sketch of the workplace showing desired furniture, equipment and services locations.

General Equipment Requirements

How many lineal feet of the following items are required?

- Countertop Desired
- Storage cabinets Above
- Storage Cabinets Below
- Other Casework
- Tall Storage Cabinets
- Open Storage Shelves
- Other

Which of the following items are required and how many are required?:

- Markerboard lineal feet
- Chalkboard lineal feet
- Tackboard lineal feet




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STRUCTURAL

GENERAL:

In addition to meeting the requirements of the referenced codes and standards herein, the design of the facilities shall meet a special requirements defined by A&E. These requirements are going to be updated as necessary to eliminate a frequent errors creating operational, maintenance or safety problems.

REFERENCES AND STANDARDS


1.1. The latest editions of the following codes, specifications, standards and publications, with applicable supplements and revisions thereto, form a part of this Manual

1.1.1. American Society for Testing Materials (ASTM) A 36 Specification for Structural Steel.

A 82 Specification for Steel Wire, Plain, for Concrete Reinforcement.

A 108 Specification for Steel Bars, Carbon, Cold-Finished, Standard Quality.

A123 Specification for Zinc (Hot-Galvanized) Coatings on Iron and Steel Products.

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A 153 Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

A 185 Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.

A 307 Carbon Steel Externally Threaded Standard Fasteners.

A 525 Specification for General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.

A 563 Specification for Carbon and Alloy Steel Nuts.

A 615 Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

A 706 Specification for Low-Alloy Steel Deformed Bars for Concrete Reinforcement.

A 775 Specification for Epoxy-Coated Reinforcing Steel Bars.


C 31 Making and Curing Concrete Test Specimens in the Field.

C 33 Specifications for Concrete Aggregates.

C 39 Test Method for Compressive Strength of Cylindrical Concrete Specimens.

C 42 Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.

C 94 Specification for Ready-Mixed Concrete

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C 138 Method of Test for Unit Weight, Yield and Air Content (Gravimetric) of Concrete.

C 143 Method of Test for Slump of Portland Cement Concrete.

C 150 Specification for Portland Cement.

C 171 Sheet Materials for Curing Concrete.

C 172 Method of Sampling Freshly Mixed Concrete.

C 192 Method of Making and Curing Concrete Test Specimens in the Laboratory.

C 231 Method of Test for Air Content of Freshly Mixed Concrete by the Pressure Method.

C 260 Specification for Air-Entraining Admixtures for Concrete.

C 309 Liquid Membrane-Forming Compounds for Curing Concrete.


C 311 Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use as a Mineral Admixture in Portland Cement Concrete.

C 494 Specification for Chemical Admixtures for Concrete.

C 618 Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.

C 685 Specification for Concrete Made by Volumetric Batching and Continuous Mixing.

C 920 Specification for Elastomeric Joint Sealants.

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C 1017 Specification for Chemical Admixtures for Use in Producing Flowing Concrete.

D 1751 Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).

D 1752 Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

F 436 Specification for Hardened Steel Washers.

1.1.2. American Concrete Institute (AOI)

117 Tolerances for Concrete Construction and Materials

301 Specifications for Structural Concrete for Buildings

305 Specification for Hot-Weather Concreting


306 Specification for Cold-Weather Concreting

315 Manual of Standard Practice for Detailing Reinforced Concrete Structures

318 Building Code Requirements for Reinforced Concrete

347 Formwork for Concrete

1.1.3. American Institute of Steel Construction (AISC)
Specification for Structural Steel Buildings.

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Code of Standard Practice for Steel Buildings and Bridges.

- 1.1.4. Concrete Reinforcing Steel Institute (CRSI)
Manual of Standard Practice for Reinforced Concrete Construction


- 1.1.5. American Welding Society (AWS)
DI .4 Structural Welding Code - Reinforcing Steel
DI .1 Structural Welding Code - Steel

- 1.1.6. Occupational Safety and Health Administration (OSHA)
Title 29, Part 1910 and Part 1926

- 1.1.7. Steel Structures Painting Council
Steel Structures Painting Manual - Vol. 2
Systems and Specifications

- 1.1.8. American Concrete Institute (ACI)

- 1.2. The latest revision of the following are recommended as guides to meet the requirements of this Manual
 - 1.2.1. American Concrete Institute (AOI)
 - 211.1 Standard Practice for Selecting Proportions for Normal and Heavyweight Concrete
 - 302 Guide for Concrete Floor and Slab Construction
 - 304 Guide for Measuring, Mixing, Transporting and Placing Concrete
 - 308 Standard Practice for Curing Concrete

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309 Guide for Consolidation of Concrete

311 ACI Manual of Concrete Inspection

347 Guide to Formwork for Concrete

SPECIAL A&E REQUIREMENTS:

Concrete Structures:

Slabs on grade:


Minimum strength of concrete for slabs on grade shall be 3,000 psi in 28 days.

All interior slabs on grade shall be reinforced with reinforcing bars. No wire fabric mesh is acceptable.

Exterior and pavement slabs can be reinforced with fibermesh concrete reinforcing fiber. Unless specific conditions such as architectural appearance specify otherwise, the cracks in slabs on grade exceeding the width of 0.03 inch (credit card is 0.03” thick) are not acceptable. The Contractor shall repair cracks wider then 0.03 in.

The control joints shall not be spaced farther then 2 to 3 times the slab thickness expressed in feet.

Concrete mix design, timely application of curing methods and saw cutting of the control joints has to be clearly identified in the concrete construction specifications for each project.

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CONSTRUCTION COST ESTIMATE

The Architecture & Engineering Project Manager is responsible for the total project budget. The Consultant is responsible in their design, for the construction and other related budget items. At the inception of a project, the A&E Project Manager must provide the construction budget to the Consultant. This will be an official written document for everyone's reference throughout design. This budget will not change unless by written notice to the Consultant from the A&E Project Manager. Construction cost estimates must be realistically and objectively prepared, but if these estimates exceed the construction budget, the Consultant must bring the situation to the attention of the A&E Project Manager immediately. The Project Manager and Consultant will schedule a meeting with all relevant parties to discuss ways to bring the project back in budget.

THE CONSTRUCTION BUDGET INCLUDES THE FOLLOWING:

- All construction costs including base bid and alternates
- 1% of project costs for public art on projects that require it
- Asbestos abatement (testing and specifications are included with design)
- Any temporary facilities required for facility occupants
- Furnishings, Furniture, Signage and Graphics

IT DOES NOT INCLUDE:

- Land Acquisition
- City of Tucson administration costs
- Consultant Fees
- Design and construction contingencies
- City of Tucson plan review fee and building permit fee
- Pima County building &/or sewer connection fees
- Special testing fees
- Moving
- Telephones
- Movable Equipment

ALTERNATES:

City of Tucson projects are done within rigid budgets. A project that bids over budget can mean a missed deadline, major schedule slips, and redesign by the Consultant. Therefore it is **ESSENTIAL** that the estimated cost for the project's base bid be 90% of the construction budget. The remaining 10% of the construction budget must be in additive alternates that will be accepted only if the bids are as favorable as the Consultant estimated. The City of Tucson must



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consider alternates in order, therefore, priorities must be established with the City of Tucson. Alternates must be clearly identified on the drawings and noted on the cover page.

THE PROJECT MANAGER SHALL THEN PREPARE THE PROJECT BUDGET TRACKING FORM

See: e:\forms\projtrac.xls



REVIEW & APPROVAL PROCESS FOR CONSTRUCTION CHANGE ORDERS

The following processes and procedures have been developed in cooperation with the Construction Focus Group Change Order Subcommittee, the Office of Equal Opportunity Programs and the Procurement and Budget Departments to provide direction on the approval process required for various construction change orders. The procedures outlined herein shall be effective immediately and shall apply to **all new and existing** specific construction contracts (e.g. IFB's) and all Alternate Project Delivery Methods (e.g. RFQ's for Job Order Contracts, Design Build Contracts and Construction Manger at Risk Contracts).

I. Field Change-Order:

Field Changes are defined as modifications to a construction contract that are made to address 1) unforeseen conditions, or 2) minor design errors or omissions and that do not amount to \$10,000 or 10% of the contract amount (whichever is less). Field Changes may be approved by the project manager unless the change involves a significant change in the scope of work.

The Contract Officer in Procurement shall be notified in writing of the Field Change within five (5) business days with a formal change order document to follow. Notification that a Field Change has been authorized should also be sent to any stakeholders for their information and records. Notification to the Contract Officer and stakeholders must be in writing (e.g. job meeting minutes, fax or e-mail). The notification shall clearly identify the contract number, project description, contractor name, change order number, description of the change and purchase order number.

Several of these minor change orders can be approved before a formal change order is issued. However, the contractor cannot be paid for the changes until a formal change order has been completely executed.

II. Changes Greater Than \$10,000 or 10% of the Contract Amount (whichever is less):

For non-emergency changes over \$10,000 or 10% of the contract amount (whichever is less) the project manager shall receive the following approvals **prior** to proceeding:

- A. **Internal Department and/or Client Approvals** (e.g. chief engineer, internal financial or budget personnel, etc.)
- B. **Office of Equal Opportunity Programs:** The OEOP shall have the opportunity to review change orders that total \$50,000 or more (individually or cumulatively) for DBE or S/M/WBE subcontracting goal opportunities. Project managers shall provide a narrative, estimated cost and subcontracting opportunities information via email to the Groupwise address 'OEOP Goals.' **Please indicate in the narrative whether or not the change is an addition or deletion to existing work versus new work that has not already been subject to a goal review and whether or not a new subcontractor or supplier will be required.** Once all the required information has been received, OEOP has committed to a one business day response time.
- C. **Budget:** The assigned budget analyst must approve changes in excess of \$10,000 or 10% of the contracted amount (whichever is less) prior to the authorization of the work.
- D. **Procurement:** The assigned contract officer must approve changes in excess of \$10,000 or 10% of the contracted amount (whichever is less) prior to the authorization of the work.

To expedite approvals, e-mail can be use to obtain prior approvals as required above. Copies of approval emails should be included with the change order form for final processing.

REVIEW & APPROVAL PROCESS FOR CONSTRUCTION CHANGE ORDERS

The formal change order document shall include sign-off/acknowledgement from the following:

- General Contractor
- Design Consultant
- City Field Coordinator
- City Project Manager
- Client Representative
- Client Budget Representative
- Budget Representative
- Procurement Contract Officer
- OEOP Goals (sign-off/approval required over \$50,000, informational copy only under \$50,000)

The Project Manager may issue the Contractor a notice to proceed once all approvals have been secured.

III. Emergency and Unknown Cost Change Orders:

Certain changes may be authorized immediately in the field that do not have a written contractor cost proposal or internal approvals. These changes could be the result of an emergency (where a threat to health, welfare or safety exists), or where if immediate action is not taken a significant cost to the City or significant negative impact to citizens will result.

In these rare instances, the contractor will be permitted to proceed to protect the public interest. The approval requirements for these changes would vary based upon the estimated cost of the change. For changes with an estimated cost over \$10,000 or 10% of the contract (whichever is less) the approvals outlined in Section II should be secured within three (3) business days including a justification of why the situation warranted field authorization. To expedite, initial approvals can be obtained via email or facsimile with a formal change order document to follow. Changes estimated below \$10,000 or 10% can be processed in accordance with Section I, Field Change Orders.

IV. Administrative Change Orders:

Change orders that are required to make internal/administrative changes (e.g. an account number change) can be processed using a short form change order.

V. Change Order Deducts:

Reductions in the work that result in a zero dollar or negative dollar impact on the contracted amount shall be subject to OEOP review if the reductions have a potential impact on the subcontracting opportunities that were previously identified and on which goals were established.

VI. Schedule Changes:

Any change orders requesting additional days must be approved through a formal change order to the contract. Schedule changes must be proven by a schedule analysis.

VII. Copies of Change Orders & Pay Estimates:

Copies of all change orders, regardless of dollar amount, shall be forwarded by the project manager to OEOP. In the event modifications are made to the change order during the execution process, the project manager will notify OEOP. Copies and/or notifications may be sent electronically.

Notwithstanding existing approval requirements, copies of all fully executed pay estimates for specific construction contracts, construction manager at risk contracts and design build contracts shall be forwarded to the Procurement Contract Officer and OEOP.

Construction Closeout Check off List

(Note: use TAB to move through document)

- Keys**
 - Signed Request Form
 - Returned Keys (to lock shop)
- Re-Keying of New Facility**
- Substitute Securities Final Payment**
- Commissioning Report**
 - Review Report (add items to punchlist as needed)
 - 1 copy to Facilities
 - Original to Construction File
- Commissioning Review**
 - Schedule or Task 10 month post occupancy commissioning review
- Controls Mapping Invitation**
 - Facilities Mechanical Dept (EMCS section)
 - Climatec (controls contractor)
 - Using Dept
 - General Contractor (GC)
 - Project Manager (PM)
 - Other:
 - Letter from (controls contractor)
- Construction Evaluation**
 - 1 copy to Using Dept
 - Signed copy from Using Dept.
- Consultant Evaluation**
 - 1 copy to Using Dept
 - Signed copy from Using Dept
- Contractor Post Project Evaluation Filled Out**
 - 1 copy to Using Dept
 - Signed copy from Using Dept
- Consultant Post Project Evaluation Filled Out**
 - 1 copy to Using Dept
 - Signed copy from Using Dept
- Finalized Permits** (copies in construction file)
- Final Project Tracking and Benchmarking**
- Financial Information Completed**
- Design LEED Certification Submittal** (verified by PM)
- Construction LEED Certification Submittal** (verified by PM)
- Final Submission LEED** (verified by PM)

| Date of Completion | Responsible Party |
|--------------------|------------------------|
| | PC (keys from GC) |
| | PC (form signed by GC) |
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| | PC & Lock Shop |
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**General Services Department
Architecture & Engineering Division**

Project Manager's Manual

WORK ORDER ESTIMATE INSTRUCTIONS

| ISSUED DATE | REFERENCE PERSON | REVISION # | REVISION DATE |
|-------------|------------------|---------------|---------------|
| 12/1/2007 | F. ELLIOTT | 2 | 5/6/2008 |
| | | Revised Pages | PAGE |
| | | 1 | Page 1 of 1 |

PREPARING THE ESTIMATE:

1. Receive the WOE. Determine/verify that the WOE has been logged in by FM-ESTIMATE. If so, the WOE has a tracking number. If the WOE does not have a tracking number, route the WOE to FM-ESTIMATE for processing.
2. Read the Customer's (Client's) Scope of Work (SOW) in the WOE and gain an understanding of what the Client wants.
3. Call the Customer and discuss the SOW in detail with particular attention to correcting any misconceptions.
4. If an existing facility, retrieve archive documents. Make copies of pertinent documents to aid during your site survey.
5. If, in your estimate, the entire WOE process will take 4 hours or more of A&E Division's time, request that the Client provide you with an account number. (This can be done at any time during the WOE process.)
6. Familiarize yourself with the existing facility through the archive documents, as related to the SOW, before you make a site visit.
7. Meet with the Customer on site; confirm the budget and schedule; understand the entire SOW.
8. Write a brief, but thorough, description of the project that fits within the DETAILS OF WORK TO BE PERFORMED on the WOE form.
9. Decide what information, resources and activities are required to develop a valid budget and schedule. Determine:
 - Is a Permit required?
 - Is the JOC method of contracting the best way to hire a contractor for this project?
 - Can the JOC do the construction drawings through the design portion of his contract?
 - Can the JOC get the permit?
 - Do you need to hire a consultant to do the design and get the permit?
 - Is Means Cost Estimating Manuals adequate for estimating construction costs?
 - Are there in house experts you can access?

10. Assemble information and calculate the construction cost (use AE ESTIMATE form.xls at E:\oooAEmiscform\AE Estimate form.xls.)
11. Estimate the soft costs or let the estimating spreadsheet calculate soft costs, such as Permit fees, GSD FM & AE Admin costs, etc.
12. Select and use an appropriate Contingency percentage as developed for the scope of the project. Example: if selective demolition is involved where unknown conditions may be present – use a higher Contingency than you normally would.
13. Review the final project costs and construction costs with the size of the project. Verify quantities, unit costs and spreadsheet formulas. Small projects usually cost more per unit than larger projects.
14. Perform a peer review by sending copies of your draft WOE to your co-workers with a comment/question sheet with a reply due date. Resolve any comments or questions with each individual.
15. Send the WOE to the AE administrator for review and corrections, if any, and the administrator will process the WOE to the Customer through FM-ESTIMATE.
16. Verify with the Customer in 5 to 8 days if they have received the WOE and, if so, do they have any questions?
17. The Customer may want you to adjust the WOE and the original SOW to fit the Customer's budget. If so, notify FM-ESTIMATE there will be a revised WOE and proceed again from item #8 above.
18. Once you have an approved WOE, with the Customer's signature and account number, set-up the project as usual, include a schedule, budget tracking, and add the project to the A&E ACCESS database.