

STATE UNIVERSITY CONSTRUCTION FUND

PROGRAM DIRECTIVES

DIRECTIVE 1A-4

Issue date: June 2013

SCHEMATIC DESIGN PHASE

1. General Instructions

- a. Provide options for significant decisions required by the client during the Schematic Phase. Present drafts of options and revise each to reflect comments made by the Fund and the campus. Present revised drafts of options and revise the selected option to reflect comments made. Present the revised, selected option to the Fund and the campus for approval.
 - 1) To assist the campus in reaching a consensus on decisions required to complete the Schematic Phase, develop a summary of each issue using an iterative process to incorporate campus and Fund input. Use the format preferred by the campus and list factors, benefits, detriments and impacts applicable to the issue.
 - 2) Provide analyses of the options to determine whether the possible options fit the funds available for the project.
 - 3) Consider constructability issues continuously throughout the design effort and make recommendations concerning the impact of the contractor's work on Campus operations.
 - 4) Provide analyses of project execution and the potential construction contract options to determine the desirable option(s) for sequencing the work in phases that fit the capabilities of the available bidders, the potential need to defer construction of portions of the project due to funding restrictions, the availability of work areas and other factors requested by the Fund and campus.
- b. The phase submission must satisfy all comments made on the previous phase report, if any. Responses to previous review comments are required. The response must clearly describe the action taken and fully address all questions raised; Reference the drawing number or specification section where appropriate.
- c. Review a draft of the report with the Fund before the formal submission. The Schematic Phase checklist is to be completed and submitted with the draft report.

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- d. The formal submission shall include the cost estimate in CSI format identifying the quantities and unit prices for each system in the Estimate Summary. Provide a comparison of any changes from the last approved estimate. The Estimate Summary shall follow the formats as shown in SUCF Publication "Project Cost Reporting"; separating site, rehabilitation, and new construction. Submit an editable electronic version to the Fund Coordinator.
- 1) For new buildings, additions and Alteration Level 3 projects, provide a list of viable value management deductions equal to at least 10% of the total construction cost estimate (or other percentage, when approved by the Fund, that is more appropriate to the project size, type, the level of design completion, etc.)
 - 2) The purpose of the value management deductions is to facilitate timely decisions on scope and cost by providing a viable alternative to adding funds to the budget. Viable value management deductions are ones that can be realistically implemented in terms of the level of design completion, program constraints, operational constraints, schedule constraints, code compliance, constructability and other factors requested by the campus and the Fund.

(c) For other projects not covered by 1d(a) above, when requested by the Fund or when the estimate exceeds the budget, provide a list of viable value management deductions, if any, that can be realistically implemented when considering the project scope.
- e. The Consultant and each sub-consultant shall provide a letter on company letterhead, signed by a principal member of the firm that certifies that the quality and completeness of the documents has passed their review and the quality of the documents submitted meet the requirements of the Fund.

2. Schematic Report

- a. The following information is to appear on the cover sheet: Project No., Project Name, Name of Campus, Name of Consultant, and issue date.
- b. Six (6) copies (pages to be numbered) - Confirm actual number of sets and mailing directive with SUCF Coordinator.
- c. The Report is to expand upon the previous phase report, if applicable, and does not require resubmission of the unchanged reports and appendices.

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d. When new or revised since the last phase submission, include copies of all meeting minutes, phase checklist, Fund and College comments, and the consultant(s) response to those comments in the appendix of the phase report.

e. Area Summary and Program/Design Deviation:

1) List of Program spaces with comparison of Program Net Area and Designed Net Area by creating a spreadsheet as follows:

| S A M P L E | | | |
|---------------------|--------------------|-------------------|------------------|
| <u>Facility</u> | <u>Net Sq. Ft.</u> | <u>Design Net</u> | <u>Deviation</u> |
| 30 Eating Area | 556 | 560 | |
| 31 Sheet Metal Shop | 3600 | 3600 | |
| a) Foreman | 120 | 130 | +8% |
| b) Storage | 600 | 500 | -17% |
| Total | 48,500 | 50,010 | +3% |

This list shall be first prepared for the Schematic Report and then updated for the Design Manual Report.

2) Area Analysis

PROGRAM: Net Area _____ Sq. Ft. Gross Area _____ Sq. Ft.
 DESIGN: Net Area _____ Sq. Ft. Gross Area _____ Sq. Ft.

Net Area to Gross Area Ratio:

Design Net: Design Gross = 1 : ()
 Program Net: Program Optimum Gross = 1 : ()

3) Consultant's verification that his design has included all functional and special requirements of Facilities Program and Site Program, functional relationships within spaces and adjacencies to related spaces except the following deviations (if none, specify "NONE").

| S A M P L E | | |
|-------------------------------------|------------------------|------------------|
| <u>Special Program Requirements</u> | <u>Design Solution</u> | <u>Deviation</u> |
| No. 5 Faculty Offices (10 @ 120) | 11 @ 110 | + 1 Fac. Off |
| No. 29 Lecture Hall (240 seats) | 228 Seats | - 12 Seats |
| Parking (200 cars) | 215 Cars | + 15 Cars |

Note: Update this list at Design Manual as noted in (1) above.

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- 4) Sitework: Include Site Program, if it has changed since last phase report. List separately all other Site Program clarifications with reference to letters, minutes of meetings, etc.
- 5) Building and Equipment Revisions:
 - i. Prepare a sheet entitled "Status of Program Revision" to identify latest Program Number and Revision Numbers. Include revised program summary in the report.
 - ii. List separately all other Program clarifications with reference to letters, minutes of meetings, etc.
- f. Attach copies of hazardous material testing, hydrant flow test, geotechnical reports, surveys, and other special investigations.
- g. Site Description (updated from Concept Report, if any)
 - 1) Brief description of design scheme to cover the relationship to campus plan/vocabulary, spatial relationship, contour/grading, land use, and circulation (vehicle/pedestrian) system.
 - 2) Brief description of site improvements (roads, parking, sidewalks, earthwork (imported material, rock, cut/fill), site utilities connections, erosion/sediment controls, utility systems, and other engineering aspects.
 - 3) Brief description of major landscape features, "green" infrastructure, including planting concept, retaining walls/stairs, site furniture, site lighting and environmental considerations related to air, water and noise pollution.
 - 4) Compare the projected volume of sewer and storm drainage, etc., for the completed projected versus capacity of existing lines. Review pressures and flows for existing water supply. Unless included in the lump sum fee or the Schedule B of the Consultant's Agreement, the services and fees related to measuring and documenting existing conditions may be provided through extra compensation when approved by the Fund.
 - 5) Identify routes of firefighting equipment and Campus snow removal patterns.

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- 6) The recommendations on foundation, planting, paving, drainage, waterproofing, etc., based on subsurface investigation and/or site utilities reports in the Appendix or assumed conditions.
- h. Summarize environmental considerations related to air, storm water (See Fund Directive 2-4), water, and noise pollution. Coordinate design options with Storm Water Pollution Prevention Plan development.
- i. Building Description (updated from Concept Report, if any)
 - 1) Brief description and analysis of design concept to cover relationships to campus plan design vocabulary, spatial form and massing.
 - 2) Brief description of the floor layout, blocking and stacking, interior partition, etc. with its rationale for accommodating the program.
 - 3) Brief description of building shell, including materials, façade, etc.
 - 4) If there are vertical transportation systems, summarize the design criteria and confirm that at least one elevator serves each mechanical space and mezzanine.
- j. Code Compliance: Summarize status of code requirements. In addition to providing updated versions of documentation provided with the Program Verification or Concept Phase submission, also provide the following:
 - 1) For Existing Building renovation work, provide plans / diagrams for each level articulating the classification of work areas and the level of alteration for each. Provide photographic documentation of existing areas where work will occur.
 - 2) Provide narratives and diagrams demonstrating anticipated floor openings / shafts and rated wall/ceiling assemblies. These shall include;
 - i. A series of plan / diagrams for all levels with floor openings / shafts identified. The purpose of each floor opening shall be articulated.
 - ii. The extent and rating of each fire rated assembly enclosing the floor openings / shafts.

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- iii. The extent, rating and type (wall, barrier, partition) of each rated wall and horizontal assembly
 - iv. If the design is using a code-permitted exception in lieu of the rated fire barrier, the plan / diagram shall articulate for each floor opening / shaft which specific exception is being used.
 - 3) Provide narratives and diagrams demonstrating Building Egress. These shall include;
 - i. A series of plan / diagrams for all levels with blocks of color or tone demonstrating occupancy types, access to exits.
 - ii. Diagram for each floor shall demonstrate the maximum travel distance for the level.
 - iii. For new construction, change of occupancy or renovations effecting exiting, provide the square footage calculations of the building, per level, provide occupancy load calculations for each level by type of functions.
 - (a) Also provide calculations for each door accessing / exiting a stair, exiting the building and for stair widths. Calculations shall identify what is required by occupant load and what is provided.
 - 4) For new construction or change of occupancy, provide a narrative / calculations addressing the plumbing fixtures. This shall include:
 - i. Occupancy load counts based on occupancy / type of function, per floor.
 - ii. The minimum code requirements per fixture type.
 - iii. The design count per fixture type.
 - 5) Provide narrative articulating conformance with Directive 1B-7, Executive Order No. 88 – “Green and Clean” Building Guidelines & SUNY Energy and Sustainability Policy. Submit a draft LEED certification checklist.

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- 6) Provide the Building Code Review Form properly filled out; one for each building involved in the project. It is not expected to include all drawing or specifications references at this submission.
 - 7) Provide a draft of any variances anticipated to be sent to Department of State with all attachments.
 - 8) Provide appropriate correspondence from the Consultant seeking approval for delegated design or any deviations from SUCF Directives.
 - 9) In addition to these items, articulate any requirements and solutions for energy efficiency, fire safety items, including access by the fire department, window washing, supplement with written information any items that cannot be fully shown on the code conformance drawings.
- k. Structural (updated from Concept Report, if any)
- 1) Description of the structural system, including seismic requirements, and table of design load based on function or space for all areas of the building.
 - 2) Provide a detailed written description of the proposed structural system and the basis for recommending the system.
 - 3) Foundation: provide a brief description of the type of foundation proposed and the basis for its selection.
 - 4) Include the depth of excavation and offsite disposition of excavated material, Imported structural fill (compacted) shall be utilized. Also, indicate the depth of frost penetration.
 - 5) State ground water level and the method of waterproofing. State needs for drainage or vapor barrier. Describe pertinent erosion control methods.
 - 6) Describe presence of rock and discuss methods and quantity of removal. Perform borings as required.
- l. Mechanical systems (HVAC, plumbing, fire protection, electrical and signal) (updated from Concept Report, if any):

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- 1) HVAC
 - i. Provide a written analysis of the calculated loads of the proposed mechanical systems. Include design load calculations. Refer to Directive 1B-7, EXECUTIVE ORDER NO. 88 – “Green and Clean” Building Guidelines & SUNY Energy and Sustainability Policy for further computer modeling requirements.
 - ii. Design demand for completed project for domestic water, fire protection, gas, chilled water, electricity, etc.
 - iii. Summarize environmental considerations related to air, water and noise pollution. Identify permits that are required. State whether an air quality assessment to analyze affect of exhausts on building outdoor air intakes or adjacent buildings and spaces is required or appropriate.
 - iv. Design criteria for various space types, for example cfm/sf or AC/H, noise criteria, duct velocities, water velocities.
 - v. In addition to the system description required in item no.1a provide a description of the following:
 - (a) Heating source and distribution
 - (b) Cooling source and distribution
 - (c) Air handling systems
 - (d) Duct distribution systems
 - (e) Piping systems
 - (f) Equipment
 - (g) Controls and Building Management System
 - (h) Energy Conservation features of design
 - (i) Special systems including laboratories, printing rooms, etc.
 - (j) For work in existing buildings, provide photographic documentation of existing areas where work will occur.
 - vi. Whenever connection to an existing building or campus wide heating or cooling system is required, the following information shall be provided:

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- (a) Capacity and condition of existing heating or cooling source.
 - (b) Capacity and condition of existing pumps.
 - (c) Analysis of the existing system's ability to satisfy the additional loads.
 - (d) Stand-alone or back-up systems required for this building when the existing system is shut down for regular maintenance.
 - (e) Unless included in the lump sum fee or the Schedule B of the Consultant's Agreement, the services and fees related to measuring and documenting existing conditions may be provided through extra compensation when approved by the Fund.
- 2) Plumbing and Fire Protection
- i. Brief description of each proposed plumbing system. Include description of special requirements such as backflow prevention and water treatment when required.
 - ii. Provide a written analysis of the calculated loads of the proposed plumbing systems including the design demand criteria and fixture count analysis
 - iii. Review the capacity of existing lines to verify their ability to accept the additional proposed loads. Arrange for a hydrant flow test and bind the results in the report. Unless included in the lump sum fee or the Schedule B of the Consultant's Agreement, the services and fees related to measuring and documenting existing conditions may be provided through extra compensation when approved by the Fund.
 - iv. Fire protection systems required and provided.
 - v. Indicate the proposed point of connection to the existing utilities on the site utility plan.
 - vi. For work in existing buildings, provide photographic documentation of existing areas where work will occur.

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3) Electrical

- i. Provide a brief description of the proposed electrical system.
 - ii. In rehabilitation projects verify the capacity and condition of the existing equipment to satisfy the proposed loads. Unless included in the lump sum fee or the Schedule B of the Consultant's Agreement, the services and fees related to measuring and documenting existing conditions may be provided through extra compensation when approved by the Fund.
 - iii. For work in existing buildings, provide photographic documentation of existing areas where work will occur.
- m. Mechanical and Electrical Equipment and Room Layouts: summarize states and provide typical module as applicable.
 - n. Brief description and type of service vehicle or equipment for which loading facilities, trash removal, window washing or road/walkway systems to be designed.
 - o. List of proposed exterior and interior finishes for major and typical areas or spaces.
 - p. Summarize environmental considerations related to air, water and noise pollution. Identify permits that are required. State whether an air quality assessment to analyze affect of exhausts on building outdoor air intakes or adjacent buildings and spaces is required or appropriate.

3. Project Schedule: Design and Construction schedules based on current projection.

| | Current Proposed Schedule | / | Last Schedule | Original Project Schedule | Recovery Schedule |
|---------------------------------|---------------------------|---|---------------|---------------------------|-------------------|
| Schematic Phase Submission | | | | | |
| Design Manual Submission | | | | | |
| 60% Drawings (Constructability) | | | | | |
| Pre-bid Report Submission | | | | | |
| Advertisement | | | | | |
| Bid Opening | | | | | |
| Construction Completion | | | | | |
| Occupancy | | | | | |

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4. Schematic Graphic Documents
 - a. General
 - 1) All drawings shall indicate the scale to which they are drawn. The minimum scale shall be 1/8"=1'-0" for building, minimum scale of 1"=50' for site, unless otherwise noted.
 - 2) Provide a north arrow on all drawings.
 - 3) Provide a key plan with the area of work highlighted on all drawings.
 - 4) Drawings shall be assembled: Title Sheet, Civil, Landscape, Code Compliance, Demolition, Architectural, Structural, HVAC, Plumbing, Fire Protection, Electrical and others.
 - 5) Where relied upon for this submission, update and expand graphics provided in previous submissions to reflect the current design.
 - b. Site (Dimensioned to campus grid if appropriate). The project site plans shall include requirements as outlined in Directive 2-1.
 - c. Provide code conformance drawings articulating the requirements stated above in 2.j, and all Code requirements for all building levels. The documents shall demonstrate:
 - 1) Actual and proposed fire areas and smoke areas if applicable.
 - 2) Locations of fire walls, fire partitions, horizontal exits and any other code required rated separations.
 - d. Provide demolition plans for rehabilitation projects. These plans shall differentiate between existing work to remain and existing work to be removed. Demolition plans are to be provided for each affected discipline.
 - 1) Provide applicable phasing and building access plans showing work and timing of major phases and contracts.
 - 2) Provide applicable asbestos and hazardous materials removal plans.

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e. Architectural

- 1) Detailed floor and roof plans (all levels): Indicate room numbers; indicate proposed materials. (Floor plans are to include building elements such as walls, columns, doors, windows, openings and all major built in equipment.)
- 2) Full building sections - indicate major levels and floor-to-floor heights For projects where above-ceiling and/or shaft space is limited, provide a coordinated section showing the routing of major components.
- 3) Detailed elevations (all faces) - indicate proposed exterior color and materials.
- 4) Typical wall sections

f. Structural

- 1) Provide single-line floor and roof framing system plans. Column lines shall be overlaid on all architectural plans.
- 2) Provide a schematic structural framing design of a typical floor that indicates the grid system, columns, shear walls, etc., with dimensions
- 3) Structural drawings are to include significant architectural steel to support special design features.
- 4) Provide schematic foundation plans.

g. HVAC, Plumbing and Electrical

- 1) HVAC
 - i. Schematic diagrams for all air and water systems.
 - ii. Preliminary sizing for all major equipment. Major equipment includes air handling units, pumps, heat exchangers, chillers, cooling towers, etc.
 - iii. System layout drawings that indicate the location of major equipment (components) and routing of piping and ductwork.

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- iv. Proposed path of travel for installation and future removal of major equipment.
 - v. In rehab projects the capacity of existing systems, which are being used to serve the new systems, is to be noted.
 - vi. In rehabilitation projects provide photographic documentation (digital format) of existing areas to be renovated. (This may be incorporated into the report).
- 2) Plumbing:
- i. Riser Diagrams (Sanitary [waste} Storm [roof drain], etc.)
 - ii. Coordinate with site utilities from the proposed project to the point of connection to the existing utility (i.e. manhole, tunnel, etc.)
- 3) Fire Protection
- i. Location of fire protection equipment rooms (fire pump, sprinkler service, etc) within the building. Include the general layout of equipment.
 - ii. Riser Diagrams of sprinkler and/or standpipe systems.
- 4) Electrical
- i. Coordinate site electrical utilities with civil consultant and provide a site plan showing the proposed method of service for the electrical power, telephone, data and fire alarm. Verify points of connection and capacity. Unless included in the lump sum fee or the Schedule B of the Consultant's Agreement, the services and fees related to measuring and documenting existing conditions may be provided through extra compensation when approved by the Fund.
 - ii. Provide a single-line diagram that includes the following:
 - (a) Method of service (college or utility). If existing system capacity to accommodate proposed electrical equipment loads.

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- (b) Major transformers and transformer substations.
 - (c) Major switchboards, distribution panels and motor control centers.
 - (d) Major components of the emergency power system.
 - (e) In rehabilitation projects provide photographic documentation (digital format) of existing areas to be renovated. (This may be incorporated into the report).
- 5) Communication and Emergency Systems: Riser Diagrams for telephone, fire alarm, emergency lighting and exit signs.
5. Massing Study – Model, perspectives or computer-generated walk-through updated to reflect the schematic design. Review with Project Coordinator.

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