STATE UNIVERSITY CONSTRUCTION FUND

PROGRAM DIRECTIVES

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MASONRY CONSTRUCTION

1. General

The requirements for masonry construction are to be in accordance with the Building Code of New York State and ACI 530, Building Code Requirements for Masonry Structures, as currently amended.

2. Specification Guidelines:

a. The Consultant must carefully outline the products and standards of construction required. Reference standards should be used to govern the quality of specified products.

b. Brick: Select brick using ASTM requirements. Grade SW or MW brick can be used in exterior location. Careful attention should be made when selecting brick that is to match existing brick. Samples during design should be presented to the Fund and the Campus.

c. When matching is not feasible, develop breaks between existing and new that are accurately portrayed in the design. Existing brick should be tested to determine its physical properties and availability.

d. When masonry restoration work is being designed, the consultant shall contract for investigative probing and field testing at various locations to determine unforeseen conditions and verification of existing conditions. Unless included in the lump sum fee or the Schedule B of the Consultant's Agreement, the services and fees related to investigative field testing may be provided through extra compensation when approved by the Fund.

e. Masonry Units: Do not specify lightweight CMU for exterior applications or as a backup material for brick or in any other location subject to high moisture content.

f. The specifications should include sufficient information (i.e., unit size, grade, type and texture) so that the Contractor can accurately bid the labor required for installation.

g. Field observation and inspection procedures are necessary to assure the successful translation of the design, drawings and specifications into a completed structure that functions as intended. (Fund's policy requires that "owner will engage an independent, qualified testing agency or a laboratory for performing required testing and not the contractor".) The consultant shall specify what independent testing will be done.

h. Mortar, grout and caulking for unit: Specify type based on performance, laboratory test requirements for specification and coverage. Hollow units are to have full mortar coverage of face shells in both the horizontal and vertical joints.

i. Caulking between masonry and adjacent materials must be selected for compatibility including adhesion, compression, and extensibility and staining characteristics.

j. Allowable unit stress for bearing walls shall be specified by the Engineer.

k. Masonry Reinforcing

1) Wall ties are designed for providing connection, transfering lateral loads, permiting in-plane movement to accommodate differential movements such as seismic movement and act as horizontal structural reinforcement.

2) The ties should be staggered in alternate rows, and only one row of ties should be located in the same bed joint to allow proper embedment in the mortar.

3) When one wythe of masonry is laid up before the other wythe or when joints do not align, adjustable ties are recommended. The Consultant should consider location in order to avoid large eccentricities between the two pieces, which may provide less strength and stiffness than anticipated.

4) As a minimum, all ties and masonry reinforcing shall be hot-dipped galvanized to comply with ASTM A153, Class B2 (1.5 ounce per square foot). Stainless steel may be appropriate in some situations.

5) Anchors and Reinforcement: Selection of anchors and reinforcement shall be determined by the relationship of the masonry element to the structural support. The type of anchor and reinforcing specified,

including its size, diameter and spacing are required to be called out on the contract documents.

6) When relieving angles and other structural components penetrate the insulation in the cavity, design the penetration to limit the thermal bridging to the greatest extent practical.

3. Weepholes and Flashing In Walls

a. Weepholes:

1) An important consideration in the design of masonry walls is the proper location of flashing and weepholes. Without it, water that does penetrate the wall cannot be diverted back to the exterior.

2) Weepholes must be provided wherever flashing is used.

3) Weepholes for masonry veneers are required to be provided at a maximum spacing of 2'-8" in the vertical joints at the base of the bottom course and at the base of the course carried on intermediate supports, if any. Provide mesh filler in cavity at weeps.

4) Weepholes should never be located below grade. Weeps shall be whole joint weep vents or open head joints. Plastic tubes are prohibited.

5) Consider ventilating the backside of masonry by installing weeps at the upper portion of these cavity walls to facilitate air circulation in the cavity.

6) Window glass may be badly stained or even etched by various mineral deposits accumulated from water runoff or leaching from large masonry areas above the windows. The Consultant is required to provide adequate drip slots in the masonry at the head of the window.

b. Air Barrier and Flashing:

1) Air barriers should used between the masonry veneer and its backup material. Flashing should be used wherever there is any possibility of water entering a structure. It should be placed over all wall openings, for instance, window sills, door sills, spandrels, caps, copings and parapet walls, etc. Provide end dams where flashing stops at the sides of openings. Flashing should lap onto adjacent air barriers,

waterproofing, roofing, etc. to provide a continuous barrier that sheds water.

2) Materials that are in contact must be compatible without deterioration.

3) Joints in flashings must be durable and waterproof and should usually lap 4" minimum. If metal is used, joints should be soldered.

4) Horizontally, Flashing should be extended 1/2" past the exterior face. Vertically, it should extend up jambs at least one course.

5) Metal flashing that extends below grade should be installed in reglets after the surface waterproofing has been applied below grade.

6) PVC flashing is unacceptable and shall not be specified.

4. Control and Expansion Joints

a. Joints shall be sized and spaced to allow the necessary thermal movement without cracking the mortar or the masonry units themselves.

b. Wherever possible, joints should be located at the edge of window, louver or door openings at natural "weak" points in the wall.

c. The Consultant shall make every effort to maintain the cavity depth between all elements of the structural frame and the exterior wythe of masonry. However, when special details provide insufficient cavity depth between the exterior wythe and the columns, control joints must be located on each side of the column.

d. All control joints shall be vertical. Staggered joints following alternating brick courses shall not be permitted.

e. Expansion joints should be located in the last joint in each run of coping, or adjacent to each corner piece, as well as at intervals along the length.

f. All joints shall be shown on the contract documents.

5. Parapet Walls and Joints

a. Parapet walls may not be higher than four times their thickness unless reinforced or laterally supported. Whenever the wall is built of unit masonry, it is to be capped with an appropriate metal coping.

b. Because of exposure on both sides, parapet walls are even more susceptible to thermal movement. All control joints in the walls shall continue through the parapet and consideration should be given to additional joints through the parapet, especially at critical locations, such as inside or outside corners.

c. Masonry copings should always overhang both sides of the wall and have integral drips.

d. Masonry coping joints are not impervious to water, so through-wall flashing must be installed underneath.

6. Protection

a. Against Freezing: Protection must be provided when outdoor temperature is below 40°F.

b. Bracing should be provided until the mortar has cured and the wall has been integrally tied to the structural frame of the building. Bracing should be designed on the basis of wall height and expected wind pressure.

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