Final Exam

Handed out: 2 June 2014
Due in Course Box in Historic Preservation Office

NO LATER THAN:
10:00 am
11 June 2014

Please answer or sketch your answers on the following pages. These questions come directly from lectures and required readings that are on the Syllabus.

Please write clearly. If a sketch is required, please keep it simple and straightforward: artistic merit is not the issue, communication is. Partial answers will get partial credit.

There are a total of 75 points possible with 6 extra credit points on the last page.

_____ Graduate

_____ Undergraduate

_____ Pass/Fail

_____ Letter Grade
1. (6 Points) You have been retained as the Architectural Conservator on a project. The project building is constructed of sandstone. During your on-site review of the building, you make the following observations in your journal:
   1) Loss of layers of stone
   2) Localized areas of deterioration of projecting elements
   3) Localized areas of deterioration around the edges of stones
What could be the potential causes for each of these three (3) types of deterioration?

2. (4 Points) Which one of these mortar ingredients is the most likely to contribute to efflorescence?

   Lime  _____
   Portland Cement  _____
   Washed Sand  _____
3. (3 Points) According to the Preservation Brief on Cast Stone what is one of the most frequently used replacement materials for cast stone installations? What are the advantages and disadvantages?

4. (3 Points) New mortar being used to repoint an existing historic brick wall should have at least three significant qualities as compared to the existing brick and mortar. What are these three qualities?

5. (3 Points) Referring again to author C.T. Grimm and class discussion, what single procedure in general is the only effective and durable method of reducing water penetration from rain into an older brick wall without significantly altering the wall’s appearance. (Note: This question is concerned with the wall itself, not specific parts of the wall such as coping, sills, etc.)
6. (4 Points) In regards to exterior wall classifications, what is the difference between a surface sealed system and a barrier wall system?

7. (12 Points) **THERE ARE THREE PARTS TO THIS QUESTION!!!!!!**

Moisture present in building materials always carries soluble and insoluble salts. When water evaporates, salt crystals are formed. What is the term for this process when:

1. It occurs on the surface of a masonry building?
2. It occurs within a masonry unit or wall?
3. When this process occurs within a masonry unit, what is the general physical characteristic of the masonry that will determine the magnitude of stress caused by the growth of the salt crystals?
8. (5 Points) Below is an image of an ice house and cold storage shed in Eastern Oregon.

(A) How would you describe this wall with formal masonry terminology (1pt)?

(B) Draw a dark black line across this, North Elevation, image of the building to notate where rising damp has occurred (1pt).

(C) Identify at least three (3) deterioration issues with this stone elevation (3pts).
9. (3 Points) Name the three (3) common sources of excessive building moisture?

10. (6 Points) Name three (3) strategies for adding Seismic Retrofitting to an unreinforced masonry wall. Please discuss their benefits (if any) and limitations.
11. (4 Points) According to class discussions, field inspection, and the Preservation Brief on Terra-Cotta, name and describe four (4) common deterioration problems with this building material.

12. (6 Points) Diagram the “lime cycle” of lime preparation, use, and hardening.
13. (4 Points) In the drawing below identify the following features: 1) tail-down bolt, 2) quoins, 3) keystone, 4) transverse bonding stones of window jambs.
14. (12 Points) The following illustration is of a building constructed of a sedimentary stone. **For each of the 12 noted stones, name how the stone is “bedded”, and whether it is correctly or incorrectly bedded.**
Extra Credit

1. (2 Points) On the interior of an outhouse in the Willamette National Forest is some graffiti that says, “Abbey lives”. What book is this referring to?

2. (2 Points) The second most widely consumed substance on Earth, after water, is produced at an estimated rate of five billion cubic yards per year. What is this substance?

3. (2 Points) According to the author C.T. Grimm (in your reading materials) and class discussion, what points on the wall-face of a brick structure is most accessible to entrance of water? And where on the wall-face does this occur most often (use a sketch if it is helpful)?