Gerry Zucca – One Semester Sabbatical Proposal, Spring 2011

Intention – research, develop Cone 5 and Cone 6 firing process

Action – research, assess, decide, test

Results/Benefits – transition to lower temperature glaze firing = more color, less environmental impact

Introduction:

I propose a two semester project with the initial research and testing completed over a one semester sabbatical. I teach courses in ceramics, glaze design and sculpture. I organize and facilitate the ceramics lab (this includes equipment needs, materials ordering, and firing of kilns). Currently the ceramics studio glaze and firing process is designed around a specific high fire temperature (Cone 9, 2336 °F). Our glaze formulas, mixed by the students, have been perfected for this specific temperature. We have 30 years of experience with glazes and firing to this temperature. Cone 9 yields durable and beautiful results. It will not be easy to switch to a new temperature, but there could be many benefits to firing at a lower temperature. This is what I intend to research.

In recent years I have begun preliminary research that indicates our program will benefit greatly from lowering our glaze fire temperature from cone 9 (2336 °F) to Cone 6 (2269 °F) or Cone 5 (2205 °F). Lowering the firing temperature will have many benefits and some possible drawbacks. If we lower the temperature of our glaze fires we will be able to achieve many more bright colors, pottery and sculptures will warp and crack less, we will save money by using less energy, we will create less pollution and the kilns will last longer. However, the lower we go with the temperature the less

vitrified (in essence less hard) the pieces will become. Copper red glazes will be more difficult to achieve and the lower silica content in the glazes will make the ceramics less durable. Further research will enable me to find the happy medium.

My theory is that Cone 6 or Cone 5 will yield a good compromise. Research and analysis will be required to select the best glaze fire temperature for the program at Moorpark College. Once the new firing temperature is selected, we need to learn how to effectively fire to that temperature. Firing a kiln is a combination of art and science. Many tests will have to be made before we find the best firing process with just the right amount of reduction.

Our 32 glaze recipes will need to be reformulated to fire to the new temperature. New example test tiles will need to be created. This part of the project will be done by the students in my Glaze Design course. Once all this work is completed, the ceramics studio could switch to the lower temperature, at the start of the following semester. We hope to achieve all the good effects of Cone 9 glaze firing with additional benefits of lower temperature firing.

The Project Organization:

1. Initial research –
   A. Research existing literature on lower temperature glazes and glaze firing (see appendices for text list)
   B. Tour Colleges during February and March that fire to Cone 6 or Cone 5. I will schedule my visit of the colleges to coincide with the firing and the unloading of the kilns.
      The list of colleges includes:
      CSU Long Beach, Cone 5 and Cone6
      CSU Fullerton, Cone 5
      Humboldt State University, Cone 6
      Santa Barbara Community College, Cone 5
      Oxnard Community College, Cone 5
   C. Attend conferences and workshops by know experts in the field **(conference and workshop exact dates are not yet available for Spring 2011)**
      1. NCECA conference - National Council on Education for the Ceramic Arts is an annual conference (April, 2011) and will be in the West Coast in 2011.
      2. John Britt's Reduction Firing workshop (May, 2011)
      3. Paul Giel workshop on Reduction High Fire with a Gas Kiln (May, 2011). Paul Giel is the kiln manufacture of the large car kilns that we use at Moorpark College.
   D. Vitrification test on stoneware clays at Cone 5 and Cone 6 temperatures. Using four different stoneware clays and

porcelain, I will compare hardness and vitrification differences at Cone 5, Cone 6 and Cone 9.

E. Weigh the pros and cons of each temperature and select one as our new glaze fire temperature.

2. Preliminary glaze test and firing test

A. Test fire five of the existing cone 9 glaze formulas to the new temperature.

B. Reformulate five glazes using glaze formulation software and glaze limit formulas.

C. Test reduction firings to new temperature with small samples in a gas kiln. This test should include copper reds and shino glazes, which will be difficult to reproduce cone 9 results. Successful firing at this new temperature can only be achieved by trial and error. A detailed log must be kept for each firing. Gas pressure and flue opening are manually adjusted over time to create the appropriate atmosphere for the development of reds. I expect firing time will be shortened by approximately two hours for each firing that currently take 10 hours. Once this is implemented in the studio it should result in a savings of 24 hours of firing time over the course of each semester. These test fires will be done at Moorpark College.

3. Test firing

A. Test firing of larger works. I will use a series of pieces that I create during the sabbatical to test these new glazes and to determine if we can get reliable results on larger ceramics art work.

B. Assessment of results will be documented in detail to serve as a guide to the reformulation of the remaining glazes.

4. Reformulation of the remaining glazes from Cone 9 to new firing temperature will be done by the students in my Glaze Design course. Once I return from sabbatical this task will be integrated into the Glaze Design course. On average, reformulation of a glaze takes three to four test firings. As part of the assignment the students will produce the set of example test tiles that will hang on the classroom glaze tile wall. Students will feel a great sense of pride when their glaze formulas are adopted for the studio.
5. Switch over at the beginning of the next semester (Spring 2012) to the new glaze formulas and the new glaze firing temperature. **No new equipment or materials are needed.**

Summary

In doing this research I will expand my own understanding of glazes and firing. I will integrate this new knowledge into my courses and my own art work.

Moorpark students in the Glaze Design class have direct use of the knowledge learned during the semester sabbatical. The students will use my sabbatical research results to facilitate the reformulation of the glazes. Students in ceramics, 3-D design and sculpture will benefit by having less warping and cracking in their work as well as having a larger more vibrant color pallet available.

This knowledge and transformation to lower firing temperature will be an asset to the school; we will fire the kilns for fewer hours, consume less energy. Shorter firing times will extend the life of the kilns due to less wear and tear. The improved use and life span of the kilns as well as the cost savings will be of great financial benefit to Moorpark College.

Our community will benefit from this project by seeing a new exciting variety of ceramics pieces with new colors and new textures in our very popular ceramics sales. And we will lower the overall environmental impact of our program.

During the past five years I have begun some preliminary research on the Cone 5 and Cone 6 firing process, but I haven't had the time to do this important project while teaching. During the regular semester, other projects and responsibilities have pushed this project back. The research that was outlined above is needed in order for this project to be realized. In the course of a single semester sabbatical I will focus on this important project and the students, the college and the community will benefit from the tangible results.

Appendices: Text List

John Hesselberth and Ron Roy, *Mastering Cone 6 Glazes,* (2002)

James Chappell, *The Potter's Complete Book of Clay and Glazes: A Comprehensive Guide to Formulating, Mixing, Applying and Firing Clay Bodies and Glazes*, (1991)

Brian Sutherland, *Glazes from Natural Sources*, (2006)

Michael Baile, *Glazes Cone 6,* (2001)