

A Project Summer of Summer Projects

Don Dekker
Rose-Hulman Institute of Technology

Introduction

During the summer of 2000, Koch Pavement Solutions and Rose-Hulman collaborated to provide ten students with the opportunity to work on five different projects. The collaboration came about because Koch had projects that they wanted to see completed and Rose-Hulman had a Lilly grant that was to encourage students working on industrial projects. Rose-Hulman paid the student salaries. This, initially, made it seem like a free worker situation for Koch Pavement Solutions, but they spent about an equal amount of money supporting the students.

The summer was a great success. The students worked hard and produced excellent results. All five projects reached a satisfactory conclusion. The projects all pertained to the asphalt highway industry although some were more civil engineering oriented and others were more mechanical engineering oriented. In three cases a civil engineering student worked with a mechanical engineering student. The projects and the enthusiasm of the students brought an atmosphere of excitement to the workplace at Koch.

Projects and Working in Pairs

The first three projects were activities that the author had personally worked on during the past couple of years. The other two came up as possible projects because of a current intense interest in the results, and were added quickly to the summer projects. The projects and the students working on them are listed below. The Junior/Senior classification is for the 2000-2001 school year. When they were interviewed, they were sophomores and juniors.

Binder Strength on the Road

Chad Wendell, Senior ME

Jason Koch, Junior CE

Binder Strength in the Laboratory

Kevin Hendrickson, Senior CE

Tara Strahle, Junior CE

Slab Fracture Testing

James Laser, Senior ME

Nate Stevenson, Junior CE

Cold Mix Workability

Jim Kubicek, Senior ME

Aidan Kunkle, Junior ME

Resilient Modulus Testing for Cold Paving

Meg Lyman, Senior ME

LaSandra Tucker, Junior CE

All of the pairs really jumped into their projects. It was very good that we picked pairs. It brought extra energy to the projects, and solving problems together is more fun than

solving problems individually. The different background and problem solving skills of both students also brought about better solutions that would have been possible with only one student working on each project. Many of the projects needed two students to work on them because there was a lot of physical work required from the team.

Orientation Week

The first week was an orientation week and followed the schedule shown below.

Tuesday AM	Safety, Personal Protective Equipment
Get Acquainted Lunch	Picnic at KOCH
Tuesday PM	Project Descriptions
Wednesday AM	Safety
Wednesday PM	Market Based Management
Thursday AM	Asphalt 101
Thursday PM	Asphalt 102
Friday – All Day	Work on Project Goals/Activities Answer Questions Consult with Individual Groups

For safety, Koch paid the cost or up to \$50 toward high top, steel-toed work boots. Most of the students didn't know much about asphalt and Gayle did an excellent job of giving them an overview. Although the orientation is important, the students didn't like sitting in the "classroom" again. They wanted to "get going" and begin their project. I'm not sure what to do about this. Some orientation is, of course, necessary, but it seemed to dampen their enthusiasm.

Weekly meetings

Beginning the second week we started having weekly meetings where each pair of students would talk about what they accomplished the past week and what they are planning to do during the next week. Members of the other groups were encouraged to offer suggestions and comments about things to try and to try to get the students to share ideas.

These meetings have been very successful because----

They provide a weekly place for sharing ideas.

The pairs don't want to say "We haven't done anything", so the meetings act as an incentive.

It provides a communication opportunity for the students and the Koch personnel to interact

It provides a vehicle for Koch personnel to instruct and educate the students.

It provides a discussion place to continually re-direct and re-define the project(s).

Presentations

Oral presentations were given at the end of the sixth week and at the end of the 12th week. Attending the mid summer presentations were several Koch managers from Wichita, the Chairman of Civil Engineering, the Chairman of Mechanical Engineering, and the Associate Dean who is in charge of TED, which funded the student salaries, in addition to the Terre Haute Koch personnel. The presentations were given using Power Point and the students determined the order of presentation so the flow of the overall presentation would work. The presentations were rehearsed on Wednesday. Basically, each group gave their presentation and then we went through each presentation slide by slide to make improvements and several technical corrections. The presentations to the group were very good due to the rehearsal.

The final presentations were given in a project presentation room on the Rose-Hulman Campus. The students again rehearsed with the local Koch employees in attendance to critique the presentations. The final presentations built on the basis of the mid-summer presentations and were excellent and well received.

Evaluation of the Students

One of the benefits to Koch is having the opportunity to observe the students in action. One of the possible positive outcomes is that Koch can hire the truly outstanding students from this program as permanent employees. It also benefits the students to get an inside look at Koch. To realize this outcome, Koch personnel must meet to discuss and evaluate the students. When the students were interviewed, the following five criteria were used: motivation, practicality(hands-on ability), communication, creativity, and teamwork. In addition to these five traits, we probably should consider leadership skills, oral presentation skills, written communication skills, and work ethic. The results of this evaluation was shared with the students, so they can benefit even more from their summer experience.

Student Evaluation of the Summer

Of course, the students should evaluate the program. Gloria Rogers ran two focus groups with the students and the Office of Assessment also had the students complete a questionnaire

Project Support & Student Ownership

The students received support from myself and Koch personnel in many ways. Marvin ordered a \$9000 humidity controlled oven and a \$3000 refrigerated circulating bath. Many parts that the students designed were constructed at R-H Specialty and Machine. Koch paid the construction costs. These are indications that the students received financial support as well as training and information gathering. Communication was encouraged and guidance was given when necessary. However, the students really had ownership of their project. I think that is the main reason that all five groups were successful. The students had the ownership to decide what is going to be done next. Progress and problems were discussed at the weekly meetings, but the project pair had the final decision to make as to the direction of their project.

The following criteria are important for successful projects.

Work in pairs

Student ownership

Koch personnel must want the information which will be produced by the project

Open, two-way communication

Project more than performing routine tests and recording data.

Financial support

Encouragement by the Koch personnel

Conclusions

The students have brought a lot of energy and enthusiasm into Koch Pavement Solutions. This energy has worked from the students up the line into the Koch personnel. Some of the information produced is breaking new ground and it is exciting to see this information verify what has been observed in the field.

There have been discussions as to how to get this type of program going at the other Koch Laboratories, because the energy and the information produced have been so beneficial.

It takes a lot to support five student project groups. They would get discouraged and need some “emotional” encouragement, or they might need some information on equipment, and need to be pointed to catalogs. Other times the equipment would break and then it needed to be repaired. All in all, it was a very interesting and exciting summer for both the students, the Koch employees and myself.