Collaborative NEES Research

Equipment Site perspective

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“I am writing this e-mail to ask you about the approximate cost of conducting a few centrifuge tests on the UCD centrifuge as part of a NEES project.”

– proposal author
NEESR projects do not pay fees to use the centrifuge facility at UC Davis. They do pay for our staff time to perform research if it is required by the project, and they pay for any research consumables.

Our relevant rates for University of California users are:

- **$100/hour ($125 non UC)** for academic consulting (eg if Bruce or I work with your team at a higher level project participant)
- **$70/hour ($90 non UC)** for engineering/programmer (eg our engineering team helps design the experiment equipment, like designing a model structure for fabrication)
- **$40/hour ($50 non UC)** for technician / administrative assistant
- **$45/hour ($55 non UC)** post doc / graduate student researcher (these are not always available)
- **$15/hour ($20 non UC)** undergraduate student assistant (these are not always available)

The UC rates are if there is a UC PI/co-PI (Davis or any other UC). If our Center were to charge for these services directly to your university then the rates would be the non UC amount and you would also have to pay a 29.5% Non-University Differential. These rates are currently pending campus review.
We typically recommend PIs budget about $5000 per test to cover time and consumables (estimated cost of consumables, replacement of damaged instrumentation, paint, tape, glue, photography, technician support and overtime) as a minimum expected expense to UCD. This estimated expense does not include the fabrication of any model structures or instrumentation.

We have an inventory of transducers for experiments to use, so you do not need to budget for specific transducers unless you need ones we don't have or need more than we have in our inventory. Our NEES O&M budget includes replacing worn transducers, but you would be charged if your researcher broke transducers due to negligence or through the design of the experiment.
Your team must budget specimen construction costs separately. For example, when we plan to build strain gaged structures, we will budget about $200 per strain gage bridge to have the gages installed. We then either have our technical staff build the structures (and pay their salary) or we order them from an outside company. The cost is about the same. When you build your structures (if you have structures) you can chose to build them yourself or pay to use our staff resources.

You also have to figure on replacing the structures over a multi-year project. Structures need to be machined, as well as instrumentation racks, etc. You might want to budget about a week per test of technician time to cover these costs. If you can reuse equipment then you can save some money on multiple tests, but this is not as easy as it sounds.
If you are planning to send a single student to Davis to perform experiments then you should budget some technician support to pay for our technicians to help build the models beyond the $3k above. We recommend the researcher come to Davis to train before trying to build their first model - https://central.nees.org/data/get/facility.groups/UCDavis/OnSiteTraining/Components%20of%20Training%20Program.pdf. If they arrive without training, you might want to include 1 month of tech support (~$7000) on the first test so that we can really help build the model. Then maybe 1 week per test to help with other tests. When our faculty perform tests they typically have one student lead the project and another student helping, as the tests can be somewhat overwhelming to a single student.
Collaboration on the Research Agenda

If you are a:

• Independent Remote PI

• Remote PI and want site consultation

• Remote PI / Site co-PI

• Site PI

We:

• Provide functional answers to describe facility resources and explain how to use them

• “Academically” collaborate on establishing the research agenda, experiment design, and analysis to meet these objectives
Collaboration on the Research Experiment

If you are a:

- Researcher that works independently
- Researcher that builds model with staff assistance
- Researcher that only wants to analyze the data and wants us to do the experiments

We say:

- “Here’s the equipment – let us know if you have any questions”
- “Please send your student to help build and test the model”
- “Here’s the data”
Experiment Cost to PI

- Independence
- Staff Help
- UCD students and staff

Non Site
To Site
Researcher question:

We plan to use a vertical array of accelerometers as inclinometers. Since the accelerometers respond at DC, we know their angle of inclination relative to the g-field. By looking at the inclination of an array of transducers you can integrate the slopes to get the deformed shape.

Do you envision this algorithm being automated where one can look at permanent deformations in the model minutes after shaking?

NEES facility answer:

Yes. Do I envision creating this algorithm - not as part of our NEES project.

This is really a research question, and I think the process will be developed by research projects using the equipment. Our NEES O&M provides the infrastructure that will allow us to do a lot of new things, but in a lot of cases we're going to have to learn to use the data as part of research projects.
Conclusions

• NEES ES staff are available resources to help with proposals and active research projects
  – Recommend discussions during proposal writing to help develop budget / scope, especially if developing new equipment
  – All conversations are kept confidential according to NEES and NSF guidelines
  – Level of involvement up to you