Engineering Proposal:

Solar Powered Workstations for the NAC Plaza

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ENGL21007 Writing for Engineering

The City College of New York

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Purpose

The purpose of our proposal is to request authorization to replace the tables in the NAC plaza on Amsterdam Ave & 136th Street with solar powered workstations to be used as a space where students can study outdoors and charge their devices.

Summary

Installing solar powered workstations in the NAC plaza would make the area much more useful place for students. It would create more places for students to charge their devices, and also motivate students to get their work done outside in the warmer months of the semester. Since we already have several tables in the NAC plaza area, which all have umbrellas or space for umbrella poles, we could purchase umbrellas that already have built in solar panels and come wired to power outlets. This way, the only thing that has to be installed are the new umbrella poles, which come ready to use.

Introduction

The City College campus has several outdoor seating areas for students, including benches and tables. In warm weather, many of the students use the outdoor tables to study, eat, or socialize. Many students tend to use the tables on campus between Wingate and Baskerville hall, or the tables in front of the Grove School. There is also a very large space, or plaza, located outside of the third floor of the NAC building on Amsterdam Avenue and 136th street which usually remains empty. If we were to make this space more appealing , the student body would be more inclined to use it.

By introducing solar powered workstations, we could make the plaza on Amsterdam much more useful to the student body. There is a total of 27 tables in this plaza, half of which are tables with umbrellas. We could replace these umbrellas with umbrellas that are already have built-in solar panels, that are already wired to a power outlet, which can be used to charge devices such as laptops, tablets, or phones.

Proposed Tasks

With the approval of the president, we would perform the following five tasks to implement solar workstations to the NAC plaza, and to other areas of the campus in the future.

Task 1: Purchase the Aurora Solar Umbrellas

The Aurora Solar Paneled Umbrella is an Umbrella with solar panels that provides available energy to charge students electronics while benefiting by being outside in the sun. It has been designed to compliment any picnic table on the market equipped with a 1-1/2" dia umbrella mounting hole in table surface. This charging station features electrical outlets to charge computers and laptops. It features also numerous usb charging ports to charge all cell phones. Lastly, it features wireless charging mats to charge wireless charging - capable devices. All of this electricity is derived from the top of the umbrella. It is 100 percent clean green solar energy. It is also made from recycled materials to be as eco-friendly as possible. Each umbrella costs $4,695.00 each. Below are some images to showcase this excellent addition to the CCNY campus. In order to purchase these umbrellas you need to contact the company via their info on their website (http://www.enerfusioninc.com/aurora.html). They will come for a consultation and

walk you through every step to purchase and install these umbrellas. Their team will install the umbrellas, no need for CCNY staff to install them.

Task 2: Obtain permission for removing umbrellas

Obtaining permission for moving the umbrellas involves getting permission from Vincent Boudreau, the president of city college. Once permission from is granted from the highest authority, then the Vice President of Operations and Chief Information Officer Ken Ihrer will be informed. He oversees Campus Planning and Facilities and is responsible for planning, implementation, and continued supervision of all technology projects at CCNY, he is involved in the project because solar panels are involved. Next would be let the Vice President for Finance, Felix Lam who is in charge of the college's financial planning, accounting and budgeting of the college know of the total cost of installing the Aurora Solar Umbrellas, which is $46,950. He will oversee the total budget of the college and the amount of funds being used. Then the Assistant Vice President of Facilities David Robinson, is the City College's Commissioner of Public Works. He will oversee most of the project, and since he is responsible for handling solid wastes, he will decide what to do with the umbrella poles that were taken out. He will also get in contact with EnerFusion Inc. and a construction company, who will take care of the task.

Task 3: Replace the umbrellas with Aurora Solar umbrellas

The process of removing the umbrellas and replacing them with the new Aurora Solar umbrellas would involve a construction company, including a site foreman, 5-7 electrical engineers to be hired since they are needed in order to install the solar panels, and about 8-10 regular construction workers to install the Aurora Solar umbrellas into the tables and remove the old ones. First step is to remove the old umbrellas, which is done by taking out the nut and bolt holding the umbrella in place, which located on the bottom of the table. The diameter of the hole in the table will be made to fit the 1-½'' diameter of the Aurora Solar umbrella. Then the nut and

bolt will be drilled into the bottom of it, keeping it stable. After the base of the new umbrella is made, the electrical engineers will then work on setting up the solar panels, power outlets and lights on the umbrella.

Task 4: Analyze the success of the solar workstations

Calculating if the cost benefit of installing these solar stations by surveying students, looking at how students, prior to having the solar stations installed, went about charging the devices. Finding out if the solar stations were a positive or negative addition to the campus.

Task 5: Expand solar workstations to other areas of campus

If the data collected from task 5 favored the solar stations then we can petition for more to be implemented around campus, therefore making City College more environmentally friendly.

Schedule

Tasks:	**Date of Tasks (by week):**							
Task 1: Purchase Aurora Solar umbrellas								
Task 2: Obtain permission for removing umbrellas								
Task 3: Replace umbrellas								
Task 4: Analyze the success of workstations								
Task 5: Begin expanding solar workstations								
	6	13	20	27	3	10	17	24
	May				**June**			

Budget

The cost of the Aurora solar: $4695 x 10 umbrellas = $46,950

Total cost of construction: 115,000

Experience

Shivani: Shivani has previous experience with projects involving renewable energy. One of these projects includes a proposal for replacing non-renewable energy sources with solar panels at University at Buffalo. Another project includes designing a wind turbine and measuring its power output. She is interested in implementing new solar powered workstations to make the outdoor spaces of CCNY more resourceful.

Jonathan S.: Jonathan has used these solar panel work station at St John's University numerous times. He used them in the summer and winter times since he goes every week there and they are highly beneficial and very easy to use. He has experience in the past with organizing and ordering products as he was president of his own club back in High School. He is extremely qualified to find more information about these tables and to coordinate this project. For this project, he reached out to the groundskeeping management at St John's and has not received a response. He took it upon himself to research a company who produces these types of workstations and found the exact company who manufactures them.

Jonathan R.: Jonathan has prior experience with fixing taxi tv’s and working on MTA buses and started a robotics club in his high school makes him suited for the project. He will figure out

the process and costs of removing the umbrella poles and finding out what permits are needed and who to get permission from in order to carry out the project.

Khemraj: Khemraj has an interest in renewable energy specifically in solar and nuclear sources. He has prior knowledge on how solar panels function and the process involved in making one. Khemraj was president of the STEM club at his high school and has an interest in new technological innovations.

References

- http://enerfusioninc.com
- https://www.ccny.cuny.edu/about/administration
- https://therealdeal.com/2018/05/15/surprise-nyc-remains-most-expensive-place-to-build-in-the-world-report/
- https://www.improvenet.com/r/costs-and-prices/construction-manager