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Clarkson CEM Consulting Group (C3G)



A Business Proposal/Concept

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Overview of Concept:

The idea of this effort is to build a business that provides pre-professional consulting in planning, engineering, and construction areas. Specific markets and services are delineated below. This would be a business enterprise that uses students in an experiential learning mode in order to deliver products that the market segments indicated would not be otherwise able to conduct using professional consulting services. Likewise, these efforts would help to build community economic opportunities by jumpstarting projects that would otherwise not be able to be done absent some key preliminary work. This would then generate further professional work and efforts that can aid in the development of a more robust North Country economy.

The concept of this plan is to develop a business around this known need of a variety of groups. The idea is that a firm provides host of services in the planning/civil/architectural/environmental design and construction areas to these organizations on a reasonable scale of cost for the customer and a revenue-generating stream for the CEM program and institution writ large.

Service Offerings

The intent of the services provided by this business would fall into pre-professional consulting. As discussed below these efforts would fall short of providing professional design services or requiring the need for a licensed professional to sign, seal, or stamp the work products. They would, however, be likely to be provided to such professionals as a precursor to their own efforts subsequent to the effort in these enterprises. It is intended that in the performance of these activities, faculty, practicing professionals, and staff would mentor, oversee, and provide applicable guidance as a part of the conduct of the work of this enterprise.

As-Built Documentation

This business will be able to aid in the documentation of existing spaces. (more to be provided)

GIS Services

Clarkson University has been teaching GIS and GPS in some capacity to students since the 1990's through the Department of Civil and Environmental Engineering (CEE). Since 2010, Clarkson University civil and environmental engineering students have been creating new GIS data for the Clarkson campus and the village of Potsdam. Each semester, students digitize features from orthoimagery and georeferenced engineering drawings and collect GPS positions for infrastructure.

In 2013, the University made a sustained commitment to expand the use of GIS throughout the curriculum by purchasing a complete ESRI site license and hiring a full time GIS Coordinator. This license permits the use of GIS for administrative uses and the Facilities and Services Department has embraced the technology by starting the conversion process from paper based to

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digital asset management. Facilities hired a full-time GIS Technician in 2014 and is actively recruiting students from the CEE department to assist in this task, with plans to add more student workers and interns in the near future. A short list of features collected so far include:

- Over 1,800 building footprints for the Village of Potsdam;
- Hundreds of access cover locations for underground utilities;
- Ten miles of recreational trails for hiking, mountain biking and skiing;
- Over 30 miles of underground utilities; and,
- Campus building locations and attributes for height, square footage, and usage.

We believe this firm is a unique opportunity for student intern enrichment as they will be placed in a real world setting with project components including complying with a scope, schedule and budget. It also serves as an opportunity to strengthen the Clarkson University and local community relationship.

Project Scoping and Conceptual Development

Many entities need services to provide a clear vision of their project to potential consultants and potential grant funding opportunities. Through a multi-disciplined charrette process, a team can create a clear depiction of the project scope inclusive of project rationale, key decision points, and required elements. Design can be carried through to a conceptual level to enable Rough Order of Magnitude (ROM) estimating and milestone scheduling. Packets will be developed to enable quick transition for grant writing and/or follow-on consulting work.

Rough Order of Magnitude and Parametric Cost Estimating

Critical to the effort is the ability to put cost to scope. The team can develop, based on a known scope the potential cost of the project or activity. These project budgets will take into account, not just the anticipated construction costs, but design costs and other owner costs. This estimating can include life-cycle analysis, cost/benefit analysis, and provide data based decision making options. Cost models for future development of the projects will be a key component as well as cost control and risk management strategies.

Periodic Maintenance Planning

Given the financial model most of the above communities/organizations work within, it is critical to plan ahead for needed facility projects so that funds can be raised and/or borrowed well in advance (often requiring a vote of the entire body). Consequently, facility status updates and maintenance schedules should be a part of every property chairperson's portfolio, but more often than not, such a report is non-existent. Providing a real property and systems analysis, providing an anticipated schedule of repairs/replacements of major systems and components, and helping to assess the life-span of facilities elements and the repercussions of failure to address facility faults over time, is a service that could be invaluable to the market.

Construction Education Services

Greater and greater awareness and concern exists in many organizations about how their efforts effect the environment. Likewise, maintaining, building, and managing a facility does not correlate to how a single person manages their home. In a culture where many people don't even know how their municipal waste is treated, education about the facilities construction and maintenance world is lacking. Providing seminars, engaging in energy audit assistance, providing tools to broadly educate groups on the process is critical to getting buy-in and spreading the word about why one should use such a service as is proposed here.

Sustainable Stewardship

A growing movement exists in organizations to address concerns about the health and wellbeing of not only its members, but also the ecology seen around them. Beyond education, as indicated above, consultancy services to achieve tangible built world goals and related environmental targets in the mission of any group as well, would be a part of what this plan envisions.

Primary Business Objectives

Community Development Support

Given the range of services offered, the firm envisioned would be seeking to help the North Country/Adirondack region in its efforts to grow the economy, create jobs, and build communities that are sustainable, resilient, and ever increasingly attractive for continued growth and investment.

Student Experiential Education

The top goal of this enterprise will be to provide students with real-world, relevant project experience in engineering design and construction management. Students would be primarily drawn from the CEM Program, but would also include Civil and Environmental Students generally as well as Engineering and Management students with a Construction Management Track (and others as the enterprise develops). Curriculum in the CEM program would be used to support this enterprise, as the enterprise supports the experiential learning needs of the students in the program.

CEM Program Financial Support

The CEM program is a distinct effort within the Civil and Environmental Engineering (CEE) Department, which provided course, course support, field trips and numerous other curricular and co-curricular activities/efforts. As such, there is a need to generate revenue to support these efforts. A key driver is the ability to generate revenue to support the CEM program fund.

Markets Targeted/Anticipated Demand:

The following delineates some of the potential clients/markets that this business would work for/with.

Communities and Governmental Organizations

It is noted that the numerous municipalities, government agencies, and school districts in the North Country/Adirondacks are resource constrained. Paying large sums to professional consulting firms eats away from their opportunities to execute tangible efforts for the communities they serve. However, absent some level of planning and design work is key to being able to justify and garner support from the State and/or other grant supporting bodies. Similarly, projects have gone awry because of inadequate support for construction administration and oversight. This business can be of great aid for these efforts and beyond, with the eye of building more projects that can be executed by the professional engineering and construction community.

Churches, Synagogues, Mosques, and other Houses of Worship

Most church bodies limitedly tap into a staff architect/engineer (A/E) or other resource when needed, primarily because the costs of those services are prohibitive, especially in initial “what-if” evaluations. Many religious groups have higher echelon leadership that is often asked for assistance in working through facilities problems. Others are simply standalone organizations that have little to no support. In some cases, larger church-type organizations themselves have widely dispersed holdings in need of repair or maintenance, or even acquisition. Helping to assist in these processes, providing tools and capabilities, providing overall program management services, would be activities this business could support.

Not-for-profit/Non-profit Organizations

Similar to the above, Non-profits and Not-for-profit organizations can often be “lean and mean” from staff and monetary resources. Yet many have facility needs or need to help allied governmental organizations to support them. These groups could use an enabler at a reduced rate to get their efforts off the ground and help to do the often required fund-raising to launch the larger effort.

Small Private Owners/Businesses

Start-ups, Family-owned businesses, storefront stores, and the like are a significant part of the North Country economy. Like with all of the above, there is significant need to provide pre-professional services at a low cost to enable the business to plan for their capital and non-capital needs against annual profit/loss and/or private income.

Challenges and Issues for all of the above

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Developing a new building program, or maintaining and existing one, is a challenging prospect, especially without a clear concept of the process and the expertise in how to plan for growth or to assess the requirements. All of the above groups that need to grow their facilities/campus, need planning studies to help maximize the use of their limited real estate, and those that need help in making business decisions about where to go next, can get these needs addressed through this kind of firm.

Most facilities need revamping over time. Working to find ways to continue the weekly rhythm of worship, in a church setting for instance, and also execute a comprehensive renovation is an enormous project management challenge. Having a team assist with phasing, finding alternate solutions to operating concerns, and guide/assist churches through this process is a specific part of the needs here.

To that end, being able to tap into a firm that specializes in doing scoping and assistance for renovations, periodic upkeep projects, and small-scale expansions/repurposing would make their life easier. Many of these smaller organizations (churches, non-profits, etc.) take the form of a start-up group that lacks significant resources to afford full A/E services, or they are an aging organization that has ample resources to allow others to do the necessary legwork/effort for them.

Financial Concept

Consulting Fee Arrangements/Income

The idea, financially, is that there is a two-pronged approach for this to work. The first/primary method of payment would be a set of scalable hourly rates. This would be similar to a normal consulting fee arrangement. The other method will be a set of flat fee options. For instance, the team could provide a conceptual scope of work for a re-roofing project for a flat price of \$XXX.

Hourly Rate

As a way to allow services beyond those envisioned in the flat fee menu, an hourly rate schedule would be used for services rendered. Contracts could be developed to allow for the upfront use of the flat fee menu, with hourly augmentation beyond those services, or as hourly consulting services with or without a GMP.

Flat Fee Menu

The concept here is to have a menu of options based upon normal, frequently used services. This menu of options would be developed over time and based on experience of the CEM faculty/staff and firm leadership. The kinds of services anticipated include: scoping of projects (e.g. replace air handler, replace roof, replace windows, etc.), initial effort charrette, bidding assistance for projects, solicitation of A/E services, development of RFP, one-time consultant visit, permit processing, and estimate based on developed scope (note: these would have various rates based on the nature, locality, and scope envisioned). The particular specific terms of this service would

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be spelled-out, limited, and provide a dependable upfront cost to the customer for the service. The basis for the fee calculation would be based upon a pre-planned level of effort. Using this level of effort, hourly rates would be used to set up the applicable flat price schedule based on historic knowledge. The goal of this is to keep cost low, reasonable, and attainable for the organizations seeking out this service.

Costs, Pay and Profit/Revenue

Costs

Critical costs for this venture will include

- payroll (see below)
- software licensing
- computer and related hardware
- printing/plotting/reprographic materials and equipment
- workspace and furnishings
- utilities
- insurance and overhead
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Student Pay

It is the plan that the students be the primary labor for this venture. This labor would be executed under the guise of an internship/co-op experience, and thus student pay would reflect this. It is anticipated that the pay scale would begin slightly above minimum wage and increase as they proceed through their academic time at Clarkson.

Faculty/Staff Pay

Faculty and staff that provide oversight, mentoring, support to the student company would need to be compensated for their time. The rates of this would generally follow University guidelines and would be tracked as distinct from academic or other University roles.

Profit/Revenue

Any resulting profit/revenue would be used to support the hosting program, CEM.

Management Plan:

The goal of this proposal would be to keep the overhead costs as minimal as possible. There would need to be an office location, but this could be a drop-in space, and appropriate network/computing capability would need to be provided. Personnel would be led by a faculty/staff leader (at least in initial stages, and then hopefully to senior/graduate level students) to provide overall management, as a part of an overall larger, more broadly defined Construction Management/Program Management firm. Depending upon demand for services, the cadre of

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actors would expand or contract with some core (say 1 or 2 persons) cadre that serve as both a base-line support/marketable bench, but also provide side-by-side mentorship with new hires, until the new hire can execute on their own (initially the leader would have to do this mentorship/training). All personnel would be assumed to have developing technical credentials which would be transparent to any potential client.

Tools/Methods/Unique Aspects

CEM Curriculum and Clarkson Education

The most important part of this effort is the students that will partake. It will be an opportunity, if not the opportunity, to put their classroom learning into practice. As such the CEM program is poised well to engage in that as we are closely tied to the Construction community as well as being nested within the CEE Department which is equally so with the A/E community. When coupled with the close relationships we have been building with the Facilities and Services Department at Clarkson we have good experience to draw on to get the best/right students for these kinds of opportunities and use them in ways that create win-win-win for all parties.

Standardized Narrative Scoping

To aid in speed and accuracy, a standard template for narrative scoping would have to be used. To be most efficient, full project manuals and construction drawings would be only provided through follow-on consultant services and for projects that get over a sizable threshold. Use of schematics, mark-ups of as-built data, and so forth would allow for graphic depictions, along with a well-done narrative SOW that accounts for the various aspects of the project. Standard reference tools would have to be used to ensure compliance and effectiveness of such tools.

Depth of Consultant/Contractor Partnerships

Through the potential clients, the team would have to be able to partner with consultants and have a reasonable working interoperability with the A/E and Construction community. An established network of specialists and other service providers would be critical to success. Given Clarkson's ongoing relationships, this seems like there is a ready-made compatibility in this area.

Sustainable Building/Infrastructure Tools

The team would be educated and trained in standard and emerging trends in environmental stewardship and sustainable/smart growth development. The team could help the organizations it works with navigate through life cycle costing, energy audits, and similar tasks associated with being green. Beyond this however, the team could help partake in visioning and mission intentions related to care for creation that extend beyond the built environment to ensure a seamless message is passed on through both space and speech.

Values and Vision Statements:

For years, a certain subset of engineers has devoted their insight and expertise to projects that benefit humanity. They defy current trends and use their extraordinary talent to find ways to improve the collective human condition. The undergraduate and graduate programs at the Wallace H. Coulter School of Engineering prepare students for tomorrow's challenges in two distinctive ways. First, the curriculum is team-based and interdisciplinary, just like today's workplace. Since engineers don't work in isolation, Clarkson University professors don't believe they should learn in isolation either. Second, the School of Engineering emphasizes the development of technology that serves humanity. Students don't pursue engineering for the sake of engineering; students are encouraged to consider the social consequences of projects by looking at the economics, ethics and environmental impact of every engineering decision. This firm extends this mission into a practical and applied use of the skills and focus of the School of Engineering in the area of Construction Engineering Management.