Florida CONCRETE MASONRY EDUCATION COUNCIL

Grant Application
The Masonry Foundation
July 12, 2019

Project Description:

The Florida Concrete Masonry Education Council, Inc. (FCMEC), a 501(c)(3) non-profit organization, is proposing to partner with the National Center for Construction Education & Research (NCCER) and Pearson Education to create online, instructor-led trainings for concrete masons to ultimately increase the number of qualified masons in the construction industry, and also create a new technique for training masons that will allow for full flexibility in scheduling and attending instructor-led training.

The FCMEC was created by Florida Statute Section 446.53 as a non-profit direct support organization of Florida's Department of Economic Opportunity. Its purpose is to bring together masonry manufacturers and contractors in an effort to plan and conduct training programs, improve access to masonry education, develop outreach programs to ensure diversity, and inform the public about the sustainability and economic benefits of concrete masonry products. The FCMEC is comprised of 13 voting members appointed by Florida Governor Rick Scott: eight concrete masonry manufacturers, two masonry contractor members of the Masonry Association of Florida, one expert on apprenticeships or workforce education, one major building industry association, and one other industry stakeholder (non-contractor/non-manufacturer), and a non-voting senior staff member from the Florida Department of Economic Opportunity. The FCMEC is funded by a voluntary manufacturer contribution of $0.0125 per manufactured and sold concrete block.

The nation is facing a severe shortage of skilled block and brick masons, a **major challenge within the industry**. The Bureau of Labor Market Statistics forecasts long-term occupational growth (until 2024) of 18.6% with average annual masonry occupation openings of 2,100. The construction industry as a whole is only showing 10.1% growth during this same period. The 2017 and 2018 hurricane seasons showcased the superiority of block homes in minimizing damage to residential buildings and the new construction and rebuilding of homes will likely increase the need for more skilled block masons.

The FCMEC has received matching funds totaling $100,000 for this project from the National Concrete Masonry Association and CareerSource North Central Florida (a local area workforce development board) and through its own matching funds. This financial request for $15,000 will finalize all costs and ensure that the project is brought to fruition. The FCMEC is proposing, in partnership with NCCER and Pearson Education, to expand the existing *NCCERconnect* system

to include masonry craft training. *NCCERconnect* is currently being used to provide trainees with available and accessible online training in several construction occupations, including electricians and carpenters. This proposal seeks to extend that availability to the concrete masonry industry and specifically the funds requested will finance safety and Level 1 basics trainings.

NCCERconnect is an online training solution that prepares students to become craft professionals. The system combines instructor-led training with an eBook textbook combined with visual, auditory and interactive elements plus training videos and Active Figures. Active Figures are interactive animations that demonstrate difficult skills and concepts. These elements are embedded throughout the eBook so students can bolster their understanding as they read. This also allows students to study the eBook at any time before or after class. Encouraging trainee engagement outside of the classroom can help the instructor and the trainees, as trainees come to class familiar with the topic so instructors can spend less time on basic course content and more time on active learning.

The easy-to-use interface allows instructors to deliver the course using pre-loaded content and essential course management tools. Instructors have a full suite of course management features including email and chat, document uploading and announcements. The instructor has the ability to create their own tests in a variety of styles. There is also an online grade book that automatically tracks the student's results on concept checks, review questions, and quizzes and tests.

Once an individual has finished a training level they will be able to take their assessment test at one of NCCER's testing assessment partner sites.

This project has the potential to provide fundamental improvements in teaching and/or learning through effective uses of technology. This type of training is particularly effective for training masons, who require, more than other crafts, a flexible training format and schedule. It is unlikely for a full class of mason trainees to be ready to start training at the same time in the same geographic area. Having access to a distance-learning platform allows trainees from multiple locations throughout a county, state or nationally to participate in the same classroom experience.

Project Objective:

The FCMEC mission is to bring together masonry manufacturers and contractors to plan and conduct training programs, improve access to masonry education, develop outreach programs to ensure diversity, and inform the public about the sustainability and economic benefits of concrete masonry products.

The FCMEC vision is to maximize and enhance the profession of skilled masonry in Florida through job training, masonry education programs, and portable credentials, with the goal of improving opportunities and increasing skills for a diverse apprenticeship workforce.

In keeping with our mission and vision, this project's objective is to specifically address the need for increased numbers of trained and qualified brick and block masons to address the ongoing masonry labor shortage throughout the nation.

Background Information:

Currently masonry education is composed of two components: classroom training and on-the-job training and pre- and registered apprenticeships. Florida has 590 students in pre-apprenticeship programs, including programs in 10 correctional institutions and nine masonry apprenticeship programs with 185 registered apprenticeships in a variety of tenures. Both On-the-Job Training (OJT) and Registered Apprenticeships teach skills, knowledge and competencies while the trainee earns a wage. OJT allows the employer to build a skilled employee while having some of the wages reimbursed. Registered apprenticeships allow the worker to advance from an entry-level worker to professional level with built-in wage increases. Achieving professional status also allows an apprentice the flexibility of working for an employer or starting his or her own business. Current models being used for apprenticeships are hybrid versions that are both time and competency based. The recruitment of masons has historically been a slow process where only one or two individuals may be able to start the classroom training component at the same time, in the same place. Traditionally the classroom training has been done in a fixed location with few trainees participating.

The development of masonry education and training modules in *NCCERconnect* is a game-changing event that has the potential to open training to any person, anywhere there is an Internet connection. The training is standardized and instructor-led but with enhancements that allow for interactive programming and learning that meets national industry standards. Because trainees can participate anywhere, individual geographic boundaries and barriers cease to exist. The potential to increase participation in the masonry industry is substantial and will align supply to future demand. Since NCCER is the leader in construction training and the partnership with Pearson increases accessibility and availability of training for all workers.

Scope of Project:

The masonry craft curriculum created by NCCER is currently used for traditional classroom training. This project will adapt that curriculum to a digital Internet-based format that can be

used by individuals to use wherever they are available to do so. Their qualifications, as well as those of the FCMEC and other partners is detailed in the next section.

As we stated above, funding from the Masonry Foundation will be used to fund safety and Level 1 basics training, however we have provided the entire scope of work of the project.

(1) Prepare contract with NCCER and Pearson to adapt the three levels of masonry training to online training through *NCCERconnect.*

(2) Prepare deliverables for publisher for each level:
- a) High resolution native files for digital presentation conversion,
- b) Review questions for each module, referenced to specific point of module text,
- c) Concept Checks for each section of each module, referenced to specific point of module text,
- d) Trade Terms quizzes for each module of Level 1 only
- e) High resolution images from curriculum to be converted to Active Figures and detailed description of each trainee interaction, and
- f) Custom Hotspot Spreadsheet detailing all enrichment resources and specific point in digital document for placement.

(3) Start development of online training and interactive content for Level 1 masonry training to include all modules including the following sample interactive content:

Level	Module	Module Title	Training Topics	Samples of Interactive Content
1	28101-13	Introduction to Masonry	Provides information about basic masonry materials, tools, techniques, and safety precautions; explains how to mix mortar by hand and lay masonry units; and describes the skills, attitudes, and abilities of successful masons.	Mix mortar by hand and spread using a trowel
1	28102-13	Masonry Tools and Equipment	Describes a variety of hand tools, measuring tools, mortar equipment, power tools and equipment, and lifting equipment that masons use on the job, and explains how to use these tools correctly and safely. Provides instructions for assembling and disassembling scaffolds.	Use the correct procedure for fueling and starting a mixer Assemble and disassemble tubular frame scaffold
1	28103-13	Measurements, Drawings and Specifications	Reviews the calculation of distances and areas common in masonry work.	

Level	Module	Module Title	Training Topics	Samples of Interactive Content
1	28104-13	Mortar	Explains the types and properties of mortar and the materials used in the mixture, including admixtures; provides instructions for mixing mortar by machine; and describes how to properly apply and store mortar.	Properly mix mortar with a power mixer
1	28105-13	Masonry Units and Installation Techniques	Describes characteristics of block and brick; how to set up, lay out, and bond block and brick; how to cut block and brick; how to lay and tool block and brick; and how to clean block and brick once they have been laid. Provides information about masonry reinforcements and accessories used to lay block and brick professionally and safely	Laying block: Lay a dry bond for block Tool a bed joint for block Laying block: Lay block to the line in courses that are true for height, level, plumb, and range Build a block lead Accurately cut block using the following tools: Masonry hammer Brick set Power saw Splitter
1	28106-13	Masonry Safety	Describes how to identify the common causes of accidents and the hazards associated with masonry tools, equipment, mortar and concrete. Provide information on using protective equipment.	

(4) Development and testing of Masonry Level 2 online modules to include, at a minimum, the following modules:

Level	Module	Module Title	Training Topics	Samples of Interactive Content
2	28201-14	Residential Plans and Drawing Interpretation	Explains how to work with residential plans and construction drawings.	
2	28202-14	Residential Masonry	Covers the construction techniques for residential and small structure foundations, steps, patios, decks, chimneys, and fireplaces. Describes work activities that the mason must perform, as well as those that tie into the masonry work	Lay out and construct a set of steps with three risers
2	28203-14	Reinforced Masonry	Focuses on the use of grout and other types of reinforcement, such as	Place grout in a hollow block wall and properly consolidate it

Level	Module	Module Title	Training Topics	Samples of Interactive Content
			reinforcing steel, to strengthen and support masonry structures. Describes the locations where grout can be used and the techniques for placement. Discusses the use and application of various types of reinforced masonry elements, such as rebar and bond beam lintels.	Build a masonry lintel out of CMU
2	28204-14	Masonry Openings and Metal Work	Introduces types of metal components, including metal rods, joint reinforcements, plates, anchors, fasteners, and hollow metal frames for doors and windows, and explains how they are installed.	Install a bearing plate Install a strap tie
2	28205-14	Advanced Laying Techniques	Describes the construction of masonry wall systems, weep vents, and joints. Includes safety requirements and interaction with structural components.	Lay out and construct intersections
2	28206-14	Effects of Climate on Masonry	Describes materials and techniques used to apply insulation and methods of moisture control as they relate to the mason's trade. Includes hot- and cold-weather considerations.	Install a 4-foot section of base flashing
2	28207-14	Construction Inspection and Quality Control	Introduces the quality control requirements for masonry construction. Presents procedures for inspection and testing of masonry materials and finished masonry construction	Perform a slump test

(5) Development and testing of Masonry Level 3 online modules and interactive content. Examples of interactive content are in the table below:

Level	Module	Module Title	Training Topics	Samples of Interactive
3	28301-05	Elevated Masonry	Describes activities involved in organizing and implementing the construction of high-rise buildings. Focuses on masonry construction techniques used in high-rise construction. Emphasizes safety and logistics.	Demonstrate hand signals used for lifting materials
3	28302-05	Specialized Materials and Techniques	Describes specialized materials and techniques in the masonry trade such as natural and cultured stone, acid brick, structural tile, etc.	
3	28303-05	Repair and Restoration	Explains problems that appear in masonry structures and describes techniques used to repair them, including tuckpointing, brick replacement, crack sealing, waterproofing, and stain removal.	Repair mortar joints by tuckpointing Replace a damaged masonry unit in a wall

Level	Module	Module Title	Training Topics	Samples of Interactive
3	28304-05	Commercial Drawings	Describes the format and content of commercial drawings and their use in conveying specific construction requirements.	
3	28305-05	Estimating	Procedures for takeoffs and estimating quantities of masonry materials and accessories needed for a job.	
3	28306-14	Site Layout – Distance Measurement and Leveling	Covers the principles, equipment, and methods used to perform distance measurement and differential leveling. Presents the layout responsibilities of surveyors, field engineers, and masons; how to understand and use site/plot plan drawings; and methods used for on-site communication.	Use a builder's level and leveling rod to determine site Use differential-leveling and distance-measurement procedures to transfer elevations up a structure.
3	28307-05	Introductory Skills for the Crew Leader	Project planning and scheduling techniques as well as coordination and communication of work assignments to masonry work crews.	

(6) Final testing and acceptance of *NCCERconnect* online training modules.

- Delivery of the final e-Book with all 20 modules in three levels, including an average of five (5) Active Figures per module
- Delivery of all review questions
- Delivery of trade terms for Level 1 training
- Delivery of concept checks
- Active Figures (as described on page 3 - average 5 per module, 20 modules in 3 levels)

To help students or trainees locate testing centers for proctored examinations, trainees can easily use the "Find Training/Assessment Center" button on the home page of the NCCER website (www.nccer.org) to find any training centers within a radius of their location who can proctor the examinations.

Summary of Qualifications:

This project is led by and supported by capable, trained professionals with recent and relevant experience in the masonry industry. The FCMEC mission is to facilitate the education and training of individuals in the field of concrete masonry and to inform and educate the public about the sustainability, economic benefits, and safety provided by the use of concrete masonry products. The FCMEC Executive Director, Jim Painter, has many years of experience in government services (once Mayor of Gainesville, Florida), masonry and entrepreneurship (owns

and operates business as a masonry contractor), and workforce development (has been Chair, Officer and Board member of CareerSource North Central Florida since its inception in 1996) and has served on the Board of a local state college (provider of construction apprenticeships) foundation for decades. Jim will have direct oversight of the project and will be personally promoting the project on a regional and national basis. The FCMEC is governed by a 13-member board comprised of eight concrete masonry manufacturers, two masonry contractor members of the Masonry Association of Florida, one expert on apprenticeships or workforce education (the Associate Superintendent for Career and Technical Education in Orange County Public Schools), one major building industry association, one industry stakeholder (non-contractor/non-manufacturer), and a non-voting senior staff member from the Florida Department of Economic Opportunity.

To facilitate the good works of increasing masonry education opportunities, FCMEC contracts with the Masonry Association of Florida (MAF) and the Masonry Apprentice and Educational Foundation (MAEF) to provide program outreach, pre-apprenticeship and apprenticeship opportunities throughout Florida. MAF is a trade association dedicated to expanding the market share of masonry construction in Florida. Their responsibility is to recruit employers and trainees to participate in on-the-job training and apprenticeships. MAEF sponsors 140 schools and independent organizations, sponsoring 6,000 pre- and registered apprenticeships throughout Florida. MAEF manages 9 apprenticeship programs where 185 apprenticeships currently work. MAEF has the necessary experience to manage the instructors who will teach and coordinate the *NCCERconnect* trainings and is committed to this project. Once the *NCCERconnect* training modules have been developed, MAEF will take the lead on recruitment of trainees.

NCCER, a Florida-based national not-for-profit 501(c)(3) education foundation, was created in 1996 as The National Center for Construction Education and Research. NCCER was developed with the support of more than 125 construction CEOs and various association and academic leaders to transform construction training. These companies created a standardized training and credentialing program with portable credentials. This progressive program has evolved into curricula for more than 70 craft areas and a complete series of more than 70 assessments offered in over 4,000 NCCER-accredited training and assessment locations across the U.S. These credentials are tracked through NCCER's Registry System for organizations and companies to track new and existing qualifications. NCCER curriculum is used in most pre- and registered apprenticeships in all trades.

NCCER partnered with Pearson to create *NCCERconnect.* Pearson is a leading training development organization, with expertise in educational products and services, assessment and professional development, and a range of teaching and learning services powered by technology. Their products and services are used by millions of teachers and learners around the globe.

Anticipated Impact:

Although the program is designed to increase the number of trained masons in Florida, the impact of this program is national in scope. Organizations throughout the nation as addressed in the attached letters of support document the need for flexible, portable, industry-recognized training that is more flexible and accessible to the national population. **Once developed the training can be used by masonry training programs throughout the nation**.

The need is great. Between 2014 and 2024 it is estimated that brick and block mason occupations will grow by nearly 20%, or by more than 21,000 individuals. This need is significant throughout the United States.

The following table shows the top 10 states with the greatest need for masons in the long-term occupational forecast, with many states doubling their current workforce:

Geography	Estimated Long-Term Growth	% Change
United States	14,500	18.6%
Arizona	660	68.1%
Colorado	1,060	64.2%
California	3,100	56.4%
Utah	830	50.6%
Nevada	310	46.9%
Florida	1,760	46.0%
Idaho	130	43.6%
Geography	**Estimated Long-Term Growth**	**% Change**
Kentucky	560	37.0%
Texas	1,730	33.9%
Oregon	230	33.6%

Overall 28 states have a greater need for masons than the national average of 18.6%

1. Budget:

The FCMEC is requesting $15,000 in grant funds to successfully complete this project. As we stated above, the FCMEC has already received $90,000 for this project from other resources as well as contributing $10,000 of its own funds.

The FCMEC contracts with an Administrative Entity who provides support to the Executive Director in board management, contract management, finance, and other related administrative duties. Approximately 6.3% of the total program cost will be used to fund those services in support of this project.

We anticipate the total cost of the program to be $115,000 to include salaries and the full cost of the on-line curriculum adaptation into *NCCERconnect*. The FCMEC currently has $100,000 in dedicated funds. Costs include some travel by the Executive Director and other supporting staff to market and provide outreach on the availability of the online curriculum to advance the training of masons. There is no charge to this program for the Executive Director's time and salary in this effort. The curriculum development cost from NCCER is $93,700, however we are only asking the Masonry Foundation for a small portion of this cost and will leverage other resources to fund the difference.

Additionally in past meetings with NCCER there was discussion that a small portion of the cost of training for individuals could return to the FCMEC, and NCMA, in a cost-sharing agreement or contribution.

The cost of the training development and integration into *NCCERconnect* is realistic and will produce cost-savings over time by eliminating the need to find, and fund, locations to hold classes.

The *NCCERconnect* cost to develop the online curriculum covers all of the modules for Levels 1, 2 and 3 masonry training. The development of these hard copy resources was covered by an NCMA grant to the Masonry Association of Florida in 2011 through 2015. These resources will be used by NCCER to develop the online training in *NCCERconnect*, thus the funds expended by NCMA for that effort would continue to be valid and useful for ongoing training.

The reasonable development cost leverages a mature curriculum (the current NCCER Masonry craft training curriculum is offered as the 3rd Edition) to be processed and converted to a format and organization suitable for delivery on an online learning management system (LMS).

The development cost include the conversion of the existing training materials to the online LMS format of *NCCERconnect* and the new development of interactive training materials (for example, Active Figures that reinforce trainee learning) and in-process evaluation tools.

The development cost does not include updates to the curriculum. In the past, curriculum was updated on an edition basis (usually in a 5 – 7 year cycle), the update cost was on the same order of magnitude as the development cost. With the current transition to agile product development, however, the updates to the curriculum for all delivery methods will be more targeted and more granular. This should result in a shorter update cycle (on the order of 1 – 2 years) for the *NCCERconnect* platform, and is anticipated to bring costs down significantly.

Requested Payment Procedure:

The FCMEC is requesting one lump-sum payment to facilitate this project.

Other Funding Sources:

The FCMEC has received $90,000 in funds to begin this project. Sources of funding are the National Concrete Masonry Association ($60,000), CareerSource North Central Florida ($30,000) and $10,000 of its own money.

Reporting Structure:

FCMEC will provide two reports during the grant period. The reports will summarize the activities and progress on deliverables within the selected timeframe, and any impediments to timely achievement. The final report will include all activities and deliverables during the life of the grant. NCCER has estimated that the delivery of the deliverables will take eight months from time of contract execution.

Southeast Concrete Masonry Association
516 D River Highway
#150
Mooresville, NC 28117

National Concrete Masonry Association Education and Research Foundation
13750 Sunrise Valley Drive
Herndon, Virginia 20171

Re: NCMA Grant Application

To Whom It May Concern:

It is with pleasure that the Southeast Concrete Masonry Association, SCMA, offers its support to this grant application by the Florida Concrete Masonry Education Council, Inc. (the Council). We believe that providing masonry craft training online will enable our industry to attract, train, and retain considerably more masonry career professionals.

Although the masonry industry is enjoying resurgence since the devastating economic downturn, the shortage of trained and skilled employees has adversely impacted our industry's ability to adequately meet the increasing demands of the marketplace.

It is our understanding that the Council will be partnering with the National Center for Construction Education & Research (NCCER) to bring nationally recognized and accredited masonry training into an online training environment. This online environment will enable the industry to offer masonry career education on a national scale and across the socio-economic and ex-offender spectrums.

Thank you for your favorable consideration of the Council's grant application.

Sincerely,

Byard Stevens
Executive Director

National Concrete Masonry Association Education
& Research Foundation
13750 Sunrise Valley Drive
Herndon, Virginia 20171

RE: NCMA Grant Application

530 E McDowell Rd.
Ste. #107-624
Phoenix, AZ 85040
Phone: 602.262.0510

October 31, 2017

To Whom It May Concern:

It is with pleasure that the Arizona Masonry Contractors Association (AMCA) offers its support to this grant application by the Florida Concrete Masonry Education Council, Inc. (the Council). We believe that providing masonry craft training online will enable our industry to attract, train, and retain considerably more masonry career professionals.

Although the masonry industry is enjoying a resurgence since the devastating economic downturn, the shortage of trained and skilled employees has adversely impacted our industry's ability to adequately meet the increasing demands of the marketplace.

It is our understanding that the Council will be partnering with the National Center for Construction Education & Research (NCCER) to bring nationally recognized and accredited masonry training into an online training environment. This online environment will enable the industry to offer masonry career education on a national scale and across the socio-economic and ex-offender spectrums. Over the last five years, AMCA has expanded our masonry high school outreach efforts to remote/rural areas in Arizona including the Four Corners area and several Native American reservations. We have seen a significant increase in the interest in masonry in these areas, but due to the remote location, AMCA is unable to provide continuing masonry education programs for those individuals interested in our trade. This initiative will help support our outreach efforts and provide a means for young adults interested in further their masonry education beyond high school.

Thank you for your favorable consideration of the Council's grant application.

Sincerely,
Regards,

Lisa A. Prichard

Lisa A Prichard
Executive Director
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Working Together to Build a Better Future for the Arizona Masonry Industry

www.azmasonry.net