



Offer and Acceptance

State of Arizona
State Procurement Office
100 N. 15th Ave. Suite 201
Phoenix, AZ 85007

SOLICITATION NO.: ADSP016-00005912 Request
for Qualifications: 2016 Annual Professional
Services List

PAGE
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Offeror: Spectrum Engineers

OF
1

OFFER

TO THE STATE OF ARIZONA:

The Undersigned hereby offers and agrees to furnish the material, service or construction in compliance with all terms, conditions, specifications and amendments in the Solicitation and any written exceptions in the offer. Signature also certifies Small Business status.

Spectrum Engineers

Company Name

1501 W. Fountainhead Parkway, Suite 330

Address

Tempe

AZ

85282

City

State

Zip

Signature of Person Authorized to Sign Offer

Aaron L. Ricks

Printed Name

Principal Electrical Engineer

Title

Phone: 480-621-3452

Fax: 480-621-3445

alr@spectrum-engineers.com

Contact Email Address

By signature in the Offer section above, the Offeror certifies:

1. The submission of the Offer did not involve collusion or other anticompetitive practices.
2. The Offeror shall not discriminate against any employee or applicant for employment in violation of Federal Executive Order 11246, State Executive Order 2009-9 or A.R.S. §§ 41-1461 through 1465.
3. The Offeror has not given, offered to give, nor intends to give at any time hereafter any economic opportunity, future employment, gift, loan, gratuity, special discount, trip, favor, or service to a public servant in connection with the submitted offer. Failure to provide a valid signature affirming the stipulations required by this clause shall result in rejection of the offer. Signing the offer with a false statement shall void the offer, any resulting contract and may be subject to legal remedies provided by law.
4. The Offeror certifies that the above referenced organization IS/ IS NOT a small business with less than 100 employees or has gross revenues of \$4 million or less.

ACCEPTANCE OF OFFER

The Offer is hereby accepted.

The Contractor is now bound to sell the materials or services listed by the attached contract and based upon the solicitation, including all terms, conditions, specifications, amendments, etc., and the Contractor's Offer as accepted by the State.

This Contract shall henceforth be referred to as Contract No. ADSP016-00005912

The effective date of the Contract is March 1 2016

The Contractor is cautioned not to commence any billable work or to provide any material or service under this contract until Contractor receives purchase order, contract release document or written notice to proceed.

State of Arizona
Awarded this

18 day of March 2016

Procurement Officer



ATTACHMENT I – General Qualifications
ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO:
ADSP016-00005912

STATE PROCUREMENT OFFICE
Department of Administration
100 North 15th Avenue, Suite 201
Phoenix, Arizona 85007

1. REVISED ADSP013-00003465: Annual Request for Qualifications

a.	FIRM (OR BRANCH OFFICE) NAME:	Spectrum Engineers
b.	FIRM (OR BRANCH OFFICE) STREET:	1501 West Fountainhead Parkway, Suite 330
c.	FIRM (OR BRANCH OFFICE) CITY:	Tempe
d.	FIRM (OR BRANCH OFFICE) STATE:	Arizona
e.	FIRM (OR BRANCH OFFICE) ZIP CODE:	85282

f. YEAR ESTABLISHED: 1982

(g1).	OWNERSHIP - TYPE:	Corporation
(g2)	OWNERSHIP - SMALL BUSINESS STATUS:	Yes

h.	POINT OF CONTACT NAME AND TITLE:	Aaron Ricks
i.	POINT OF CONTACT TELEPHONE NUMBER:	480-621-3452
j.	POINT OF CONTACT E-MAIL ADDRESS:	alr@spectrum-engineers.com

k. NAME OF FIRM (If block 1a is a branch office):



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2. EMPLOYEES BY DISCIPLINE

a. Discipline Title	b. Function: Primary (P) or Secondary (S)	c. No. of Employees - Firm	d. No. of Employees - Branch
Electrical Engineer	P	19	3
Mechanical Engineer	P	10	4
Fire Protection Engineer	P	1	1
Architectural Engineer	P	2	1
Technology Designer	P	6	2
Total			



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3. PROFILE OF FIRM'S EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST YEAR

a. Approximate No. of Projects	b. Experience	c. Revenue Index Number (see below)
30	Acoustics, Noise Abatement	4
84	Airports; Terminals and Hangers; Freight Handling	3
38	Auditoriums and theaters	4
337	Commercial Building (low rise); shopping centers	5
7	Computer Facilities	3
48	Dining Halls; Clubs; Restaurants	3
623	Educational Facilities; Classrooms	7
55	Fire Protection	2
33	Garages; Vehicle Maintenance Facilities; Parking Decks	3
613	Hospitals and Medical Facilities	6
67	Hotels; Motels	4
17	Housing (Residential, Multi-family, Apartments, Condos)	6
15	Industrial Buildings; Manufacturing Plants	3
121	Judicial and Courtroom Facilities	4
14	Labs - General	4
891	Office Buildings; Industrial Parks	6

PROFESSIONAL SERVICES REVENUE INDEX NUMBER

- | | |
|---|---|
| 1. Less than \$100,000 | 6. \$2 million to less than \$5 million |
| 2. \$100,000 to less than \$250,000 | 7. \$5 million to less than \$10 million |
| 3. \$250,000 to less than \$500,000 | 8. \$10 million to less than \$25 million |
| 4. \$500,000 to less than \$1 million | 9. \$25 million to less than \$50 million |
| 5. \$1 million to less than \$2 million | 10. \$50 million or greater |



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4. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT (Complete one Section 4 for each key person.)

a. NAME Aaron Ricks, P.E., LEED AP		b. ROLE IN THIS CONTRACT Principal-in-charge/Principal Electrical Engineer		c. YEARS EXPERIENCE	
				1. TOTAL 13	2. WITH CURRENT FIRM 4
d. FIRM NAME AND LOCATION (City and State) Spectrum Engineers, Tempe, AZ					
e. EDUCATION (DEGREE AND SPECIALIZATION) B.S. Electrical Engineering			f. CURRENT PROFESSIONAL REGISTRATION (STATE AND DISCIPLINE) Registered Professional Engineer / Arizona #48564 Registered Professional Engineer / Nevada #019933 Leadership in Energy and Environmental Design Accredited Professional		
g. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.) Mr. Ricks is a professional engineer (P.E.) licensed to practice electrical engineering in Arizona and Nevada with more than 10 years of electrical engineering design and planning experience. He is a Leadership in Energy and Environmental Design Accredited Professional (LEED AP). His areas of specialization include power distribution and lighting. He is skilled in the preparation of electrical construction documents including drawings, specifications, calculations and spreadsheets. He possesses direct experience and familiarity with the National Electric Code, NFPA, IEE, IECC and ASHRAE as well as AutoCAD software. Member—United States Green Building Council (USGBC).					
H. RELEVANT PROJECTS					
(1) TITLE AND LOCATION (City and State) Arizona State University Lattie F. Coor Hall Generator Reliability Phase 2B, Tempe, AZ		(2) Year Completed			
		Professional Services 2013		Construction (if applicable) 2014 (expected)	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		<input checked="" type="checkbox"/> Check if project performed with current firm			
1) Project Electrical Engineer for Coor Hall to improve systems reliability. This project consisted of upgrading the HVAC and electrical infrastructure for the Intermediate Data Frame (IDF) and Main Data Frame (MDF) rooms within the facility. This includes installation of mechanical split systems, standby generator, and redundant automatic transfer switches and UPS systems to all critical loads. The mechanical and electrical systems are anticipated to be monitored by the central plant. SIZE: 6,000 SF / \$1.6 million					
(1) TITLE AND LOCATION (City and State) Arizona State University Campus Reliable Power Study, Gap Analysis, Master Plan, & Phase I Priority System Upgrades, Tempe, AZ		(2) Year Completed			
		Professional Services 2012		Construction (if applicable) 2012	
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		<input checked="" type="checkbox"/> Check if project performed with current firm			
2) Project Electrical Engineer for this \$587,869 study and \$1.3 million Priority 1 Upgrades of power systems affecting the entire campus and campus buildings as well as some satellite campus facilities. Following a comprehensive inspection of campus systems, Spectrum Engineers prepared a master plan for the "ASU Reliable Power for the Tempe Campus", establishing a consensus-based campus standard of Uptime requirements for stakeholder equipment and facilities based upon a process which documents and evaluates the stakeholders' needs. The master plan includes: Owner's Project Requirements, ASU Standard for Reliability, Critical Load Summary, Campus Medium Voltage Distribution and Generation System, Existing Medium Voltage One-Line Diagram, Campus Low Voltage Generation and Distribution, CHP Reliability Report, Gap Analysis and the Electrical Infrastructure Master Plan. The first phase of upgrades identified in the study and master plan documents are currently being performed.					



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a. NAME Stewart “Skip” Greene, P.E.	b. ROLE IN THIS CONTRACT Electrical Project Manager	c. YEARS EXPERIENCE	
		2. TOTAL 38	2. WITH CURRENT FIRM 38

d. FIRM NAME AND LOCATION (*City and State*)
Spectrum Engineers, Tempe, AZ

e. EDUCATION (<i>DEGREE AND SPECIALIZATION</i>) B.S. Electrical Engineering	f. CURRENT PROFESSIONAL REGISTRATION (<i>STATE AND DISCIPLINE</i>) Registered Professional Engineer / Utah #170193 Registered Professional Engineer / Texas #68292 Registered Professional Engineer / Wisconsin #26763-6
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g. OTHER PROFESSIONAL QUALIFICATIONS (*Publications, Organizations, Training, Awards, etc.*)
Stewart E. “Skip” Greene is the CEO and a principal electrical engineer with Spectrum Engineers and the Chief Operating Officer of Spectrum’s Arizona office. Skip is a registered Professional Engineer with more than 35 years of experience in the design of electrical systems for the built environment. Skip has honed his interpersonal skills as CEO for Spectrum. He encourages collaboration and is adept at coordinating and inspiring team members to achieve a complete and productive design package, tailored to the owner’s needs. His project experience in working with design teams, with architects, and with clients, as well as his senior-level experience in all aspects of electrical engineering will help contribute to the team leadership that projects require. Mr. Greene has more than 30 years of experience in the design of complex electrical systems for 100+ hospital and healthcare projects.
Member—National Fire Protection Association (NFPA)
Member—Illuminating Engineering Society (IES)
Member—The U.S. Green Building Council (USGBC)
Member—Construction Specification Institute (CSI)

H. RELEVANT PROJECTS

(1) TITLE AND LOCATION (<i>City and State</i>)	(2) Year Completed	
	Professional Services	Construction (<i>if applicable</i>)
Arizona State University ISTB 1, Tempe, AZ	2013	2013
1) (3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Principal-in-Charge for this research facility and complete data center serving the entire ASU campus. The project involves designing systems for research facility and data center areas affirming “no operational failure” can occur. Includes complete redundant chilled water, air handler, hydronic and electrical systems are provided. This building also houses the ASU Vivarium Research unit. Budget: \$5 million. Size: 90,000 sq. ft. (estimate).		
Arizona State University Campus Reliable Power Study, Gap Analysis, Master Plan & Phase I Priority System Upgrades, Tempe, AZ	2012	2012
2) (3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Principal-in-charge and principal electrical engineer for this \$587,869 study of power systems affecting the entire campus and campus buildings as well as some satellite campus facilities. Following a comprehensive inspection of campus systems, Spectrum Engineers prepared a master plan for the “ASU Reliable Power for the Tempe Campus”, establishing a consensus-based campus standard of Uptime requirements for stakeholder equipment and facilities based upon a process which documents and evaluates the stakeholders’ needs. The master plan includes: Owner’s Project Requirements, ASU Standard for Reliability, Critical Load Summary, Campus Medium Voltage Distribution and Generation System, Existing Medium Voltage One-Line Diagram, Campus Low Voltage Generation and Distribution, CHP Reliability Report, Gap Analysis and the Electrical Infrastructure Master Plan. The first phase of upgrades identified in the study and master plan documents are currently being performed.		



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a. NAME Dave Wesemann, P.E., LEED AP	b. ROLE IN THIS CONTRACT Principal Electrical Engineer	c. YEARS EXPERIENCE	
		3. TOTAL 15	2. WITH CURRENT FIRM 6

d. FIRM NAME AND LOCATION (*City and State*)
Spectrum Engineers, Tempe, AZ

e. EDUCATION (*DEGREE AND SPECIALIZATION*)
B.S. Electrical Engineering

f. CURRENT PROFESSIONAL REGISTRATION (*STATE AND DISCIPLINE*)
Registered Professional Engineer in 27 states including Arizona #31244

g. OTHER PROFESSIONAL QUALIFICATIONS (*Publications, Organizations, Training, Awards, etc.*)
Mr. Wesemann is a Principal Engineer for Spectrum Engineers, with more than 22 years of electrical engineering design, cost control and construction review experience. His project leadership, attention to detail and schedules, and ability to coordinate various services with the electrical design are hallmarks of his work. Mr. Wesemann’s experience includes several projects at the Veterans Affairs Medical Center in Salt Lake City. Member—Institute of Electrical & Electronics Engineers, Inc. (IEEE); Illuminating Engineering Society (IES); Building Industry Consulting Services International (BICSI); American Council of Engineering Companies (ACEC); The U.S. Green Building Council.
34+ awards and award-winning projects

H. RELEVANT PROJECTS

	(1) TITLE AND LOCATION (<i>City and State</i>)	(2) Year Completed	
		Professional Services	Construction (<i>if applicable</i>)
1)	Salt Lake City Public Safety Complex, Salt Lake City, UT	2011	2013
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Principal electrical engineer for this \$124 million Public Safety Complex which comprises approximately 170,000 sq. ft. of space to house Salt Lake City’s police department administration and department-wide services and fire department administration. The complex is home to a combined dispatch center and Emergency Operations Center (EOC). A below-grade, enclosed and secure parking structure accommodating approximately 400 vehicles is also part of this project. A public plaza space is provided on the remainder of the site. This project is pursuing LEED® Silver.		
2)	Arizona State University Campus Reliable Power Study, Tempe, AZ	2009	NA
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm, Mr. Wesemann prepared a master plan complying with the university’s standard for reliability that establishes a campus standard of uptime requirements for equipment and facilities. The existing distribution, generation and utility systems were analyzed for gaps which pose risk of outage. Using SKM software, a load flow study, voltage drop study, and an ARC flash study were performed to determine noncompliant. A failure modes and effects analysis was performed and included a survey of cooling infrastructure, access security and other related gaps that increase the risk of downtime. A study of the existing SF6 switches was included and a report was issued detailing these results.		
3)	University of Utah Campus Wide Electrical Utility Distribution Upgrade, Salt Lake City, UT	current	current
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE <input type="checkbox"/> Check if project performed with current firm, [Blank]		



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(3) BRIEF DESCRIPTION (*Brief scope, size, cost, etc.*) AND SPECIFIC ROLE

Check if project performed with current firm

Mr. Wesemann is the Principal Electrical Engineering providing services to replace the majority of the electrical distribution system. The project budget is \$85 million, phased over a 3-year period (2012 - 2014). The first phase consisting of approximately \$15 million is designed with construction under way. The entire electrical distribution was modeled using SKM Power Tools® for system analysis and coordination. Reliability Analysis was performed using IEEE Std 493-2007 ("The Gold Book") to verify that the design approach provided optimum reliability, and ensure that State money is spent wisely. Outages for critical buildings cannot be tolerated, so "Methods of Procedure" (MOP's) are developed to minimize outages during equipment and cabling change-overs. Voltage conversions from 5 kV and 7 kV systems to standard 15 kV distributions.



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a. NAME Gerald F. Nelson, B.S.A.T.		b. ROLE IN THIS CONTRACT Principal Technology Designer		c. YEARS EXPERIENCE	
				4. TOTAL 23	2. WITH CURRENT FIRM 22
d. FIRM NAME AND LOCATION (<i>City and State</i>) Spectrum Engineers, Tempe, AZ					
e. EDUCATION (<i>DEGREE AND SPECIALIZATION</i>) B.S. Audio Technology			f. CURRENT PROFESSIONAL REGISTRATION (<i>STATE AND DISCIPLINE</i>)		
g. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.) As principal technology designer for Spectrum Engineers with 23 years of experience, Mr. Nelson has successfully provided consulting services for numerous facilities throughout North America and various places around the world. He possesses expertise in designing specialized technology that relates to higher education and community libraries as well as classrooms, auditoriums, conference rooms and lecture halls. His involvement in projects is vital to ensure that audiovisual (AV), voice/data, intercom, security and other electronic systems are planned and designed to meet current needs while accommodating future expansion and emerging technology. He has vast “hands-on” experience in the engineering of local area and wide area network systems, media retrieval systems, sound systems, intercom /paging and other communications technologies. He is a practitioner of “electronic systems common sense” and implements proven design methods within a highly technical environment. His involvement in projects is vital to ensure that technology systems are planned and designed to meet current needs while accommodating emerging technology. Member—Audio Engineering Society					
H. RELEVANT PROJECTS					
1)	(1) TITLE AND LOCATION (<i>City and State</i>) Second Floor Courtroom, Cheyenne, WY		(2) Year Completed		
			Professional Services 2009	Construction (<i>if applicable</i>) 2010	
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Principal technology designer and project manager. Audio and video systems: Successfully completed the Discovery and Presentation, Design, and Installation Support task orders for audio systems, video evidence presentation systems, and fixed video conferencing systems in the second floor courtroom. This courtroom was a new build-out inside an existing building.				
2)	(1) TITLE AND LOCATION (<i>City and State</i>) Utah Multi-Agency State Government Office Building, Salt Lake City, UT		(2) Year Completed		
			Professional Services 2008	Construction (<i>if applicable</i>) 2009	
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Principal technology designer for this 265,000 sq. ft., \$40 million design/build project. MASOB is the new home to for the Departments of Human Services (DHS) and Environmental Quality (DEQ) and includes approximately 700 parking stalls. This four-story building includes a cafeteria, lockers/showers, fitness center and building reception.				
3)	(1) TITLE AND LOCATION (<i>City and State</i>) Veterans Affairs George E. Wahlen Medical Center Campus Wide Fiber Optic Backbone Upgrades Study and Design, Salt Lake City, UT		(2) Year Completed		
			Professional Services 2008	Construction (<i>if applicable</i>) 2010	
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE <input type="checkbox"/> Check if project performed with current firm				



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(3) BRIEF DESCRIPTION (*Brief scope, size, cost, etc.*) AND SPECIFIC ROLE

Check if project performed with current firm

Principal-in-charge of technology design services for this project which provides new design for singlemode fiber backbone distribution system. The study was of the existing campus multimode fiber optic distribution system, which used a single central node location, and an investigation of the migration of multimode to singlemode. Included designing a multimode system with the addition of two other distribution nodes providing closer access to the east and west side of the complex for better network management and utilization. An existing data center was not sufficient for expansion capabilities so a new data center was designed. The scope of design was significantly increased as the project received new funding. Cost: \$750,000 (final construction budget including study and design).



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a. NAME Jeffrey D. DuBois, P.E., FPE	b. ROLE IN THIS CONTRACT Principal Fire Protection Engineer	c. YEARS EXPERIENCE	
		5. TOTAL 15	2. WITH CURRENT FIRM 6

d. FIRM NAME AND LOCATION (*City and State*)
Spectrum Engineers, Tempe, AZ

e. EDUCATION (<i>DEGREE AND SPECIALIZATION</i>) B.S. Mechanical Engineering	f. CURRENT PROFESSIONAL REGISTRATION (<i>STATE AND DISCIPLINE</i>) Registered Fire Protection Engineer / Arizona / #46296 Registered Professional Engineer / Utah / #265949-2202 Registered Professional Engineer / Illinois / # 062-055530 Registered Professional Engineer / Maryland / #38578
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g. OTHER PROFESSIONAL QUALIFICATIONS (*Publications, Organizations, Training, Awards, etc.*)
Jeff DuBois, P.E., FPE, is a principal and licensed fire protection engineer (FPE) and licensed professional mechanical engineer (P.E.) with more than 15 years of national design and project management experience in fire suppression systems for new and remodeled projects. His experience includes new fire suppression systems for more than 300 facilities and fire suppression system upgrades for more than 200 remodeled projects. He has overseen engineering services on projects across the country including underground piping systems, fire flow calculations, high piled storage systems, fire alarm systems, and commercial sprinkler systems. Mr. DuBois provides clients strong communication skills and sound engineering judgment, giving him the ability to consistently achieve desired results. He is accustomed to negotiating with building and fire department officials to implement the most effective fire protection for a project while mitigating unrealistic demands placed on the client. He is a member of National Fire Protection Association (NFPA), Society of Fire Protection Engineers (SFPE), Utah Society of Fire Protection Professionals (USFPP). He is also a consultant/writer for AIA/MASTERSPEC—sections include clean agents and foam systems.

H. RELEVANT PROJECTS

	(1) TITLE AND LOCATION (<i>City and State</i>)	(2) Year Completed	
		Professional Services	Construction (<i>if applicable</i>)
1)	Salt Lake City Public Safety Complex, Salt Lake City, UT	2011	2013
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Principal fire protection engineer for this \$124 million Public Safety Complex which comprises approximately 170,000 sq. ft. of space to house Salt Lake City's police department administration and department-wide services and fire department administration. The complex is home to a combined dispatch center and Emergency Operations Center (EOC). A below-grade, enclosed and secure parking structure accommodating approximately 400 vehicles is also part of this project. A public plaza space is provided on the remainder of the site. This project is pursuing LEED® Silver.		
2)	Joint Agency Traffic Management Center, City and County of Honolulu, Hawaii	2013	2014 (expected)
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Principal fire protection engineer for the Honolulu Joint Traffic Management Center (JTMC) which is a new building that will bring transportation operations and emergency responder communications personnel (and their operations systems) together for the purpose of improving traffic management on Oahu. A Concept of Operations was developed to provide guidance to the JTMC Steering and Executive Committees for developing the project leading to development of a Joint Traffic Management Center Master Plan. The Master Plan helped to define the project in terms of potential size, costs, opportunities, and challenges. During this time frame, Steering Committee members toured and benchmarked several mainland JTMC facilities.		



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a. NAME Ray W. Moore, P.E., CPD, LEED AP, FASPE	b. ROLE IN THIS CONTRACT Principal Mechanical Engineer	c. YEARS EXPERIENCE	
		6. TOTAL 44	2. WITH CURRENT FIRM 7

d. FIRM NAME AND LOCATION (*City and State*)
Spectrum Engineers, Tempe, AZ

e. EDUCATION (*DEGREE AND SPECIALIZATION*)
B.S. Civil Engineering

f. CURRENT PROFESSIONAL REGISTRATION (*STATE AND DISCIPLINE*)
Registered Professional Engineer (Mechanical) in Arizona #22734
LEED® Accredited Professional

g. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.)
Mr. Moore offers clients more than 40 years of engineering and design experience. His interests in mechanical and plumbing engineering stretch beyond designing these systems for high-profile and complex projects, taking him into the classroom where he has been able to share his expertise and experience with others. An active member of several professional organizations, Mr. Moore currently serves as the Vice President Legislative for the American Society of Plumbing Engineers. In addition to awards like the Excellence in Industry Award (Utah Chapter of ICBO), He has been recognized many times by professional organizations for his contributions to their goals. He has taught numerous seminars throughout the Intermountain area on plumbing and mechanical-related topics since 1996. Member—ASHRAE, ASPE, NSPE, IAPMO, NFPA, ICC

Publications
ASPE Domestic Water Heater Design Manual / Misc. Chapters / 2003
Plumbing Code Comparison Column / ASPE *Plumbing System & Design Magazine* / 2003–present
ASPE Data Book / Volume 4 / Chapter 7 “Vibration Isolation” / 2001 (2003)
Plumbing System & Design Magazine / Bi-monthly Plumbing Code articles / 2003 to Present

H. RELEVANT PROJECTS

	(1) TITLE AND LOCATION (<i>City and State</i>)	(2) Year Completed	
		Professional Services	Construction (<i>if applicable</i>)
1)	Northern Arizona University, North Valley Tenant Improvement, Phoenix, AZ	2007	2007
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Principal mechanical and plumbing engineer for this tenant finish involving design of a heat pump system for this 45,000 sq. ft. building which was remodeled into classrooms and office space for Northern Arizona University.		
2)	Orem City Energy Upgrade, Orem, UT	2010	2011
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Principal mechanical engineer and Prime A/E (Spectrum Engineers is also the electrical engineer for this project) providing mechanical engineering for the energy upgrades of the mechanical and electrical systems of the Orem City Center complex, which includes the children’s library, city administration and old library. Work involved includes installation of VFD on air handler 2, upgrades to the HVAC control system, installation of premium efficient fan motors, Direct Digital Control (DDC) installation, a new chiller for the city admin/old library, cooling tower renovation, premium efficient fan motor replacement for the admin/old library, VAV retrofit of dual duct system, conversion of chilled water system to variable flow, new high-efficiency condensing modular boilers and energy-efficient lighting upgrades to children’s library, old library, and city administration. Cost: approximately \$93,000.		



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a. NAME Sarah Rollins, M.S.		b. ROLE IN THIS CONTRACT Acoustician and Technology Designer		c. YEARS EXPERIENCE	
				7. TOTAL 6	2. WITH CURRENT FIRM 1
d. FIRM NAME AND LOCATION (<i>City and State</i>) Spectrum Engineers, Tempe, AZ					
e. EDUCATION (<i>DEGREE AND SPECIALIZATION</i>) B.S. Applied Physics, Acoustics Emphasis M.S. Physics, Acoustics Emphasis			f. CURRENT PROFESSIONAL REGISTRATION (<i>STATE AND DISCIPLINE</i>)		
g. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.) Ms. Rollins possesses more than six years of progressive advancement in acoustical consulting and project management. She is accustomed to coordinating acoustic designs with architects and mechanical engineers, and performing field measurements and construction observations. Associate Member of the Acoustical Society of America (ASA); Member of Synergetic Audio Concepts (Syn-Aud-Con)					
H. RELEVANT PROJECTS					
1)	(1) TITLE AND LOCATION (<i>City and State</i>) Weber State University Davis Campus Professional Classroom Building Central Plant Study, Layton, UT		(2) Year Completed		
			Professional Services 2012	Construction (<i>if applicable</i>) NA	
(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Ms. Rollins was the project acoustician providing an acoustical study of the noise generated by a new Central Utility Plant, currently under construction. The study involved conducting ambient noise measurements (before the plant was in operation) in nearby residential areas. Ms. Rollins also provided the university with preliminary noise-level predictions for the same residential areas predicting the potential differences in noise levels once the plant is in operation. \$2500 fee.					
2)	(1) TITLE AND LOCATION (<i>City and State</i>) Utah Valley University New Classroom Building, Orem, UT		(2) Year Completed		
			Professional Services 2012	Construction (<i>if applicable</i>) 2013	
(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Ms. Rollins was the acoustician for this project. She provided architectural acoustics, acoustical separation, HVAC noise and vibration control for the large auditorium, classrooms and offices housed in this building. The auditorium seats nearly 1000 people and is divisible into as many as three smaller halls. Spectrum Engineers also provided electrical engineering (including LEED® consulting and power distribution within the new building as well as a related medium voltage services such as a substation reliability upgrade and new central plant electrical gear), technology design (including security, AV, voice/data cabling) and lighting and theater design. Budget: \$46 million. Size: 250,000 sq. ft.					
3)	(1) TITLE AND LOCATION (<i>City and State</i>) Wenatchee Valley College Arts & Music Building, Wenatchee, WA		(2) Year Completed		
			Professional Services 2008	Construction (<i>if applicable</i>) 2008	
(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE <input type="checkbox"/> Check if project performed with current firm Acoustician to provide AutoCAD details and specifications for double stud walls and spring-isolated ceiling. Observed and corrected construction of double stud walls, isolated ceilings and acoustically-shaped ceilings. Budget: \$7 million (estimate)					



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Phoenix, Arizona 85007**

a. NAME Austin Abney, E.I.T, LEED AP	b. ROLE IN THIS CONTRACT Mechanical Designer / Engineer-in-Training	c. YEARS EXPERIENCE	
		8. TOTAL 6	2. WITH CURRENT FIRM 1

d. FIRM NAME AND LOCATION (*City and State*)
Spectrum Engineers, Tempe, AZ

e. EDUCATION (<i>DEGREE AND SPECIALIZATION</i>) B.S. Mechanical Engineering	f. CURRENT PROFESSIONAL REGISTRATION (<i>STATE AND DISCIPLINE</i>) Leadership in Energy and Environmental Design Accredited Professional (LEED AP) Passed Engineer-in-Training (EIT) exam / 2007
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g. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.)
Mr. Abney has two years of mechanical engineering and design experience, and four years of experience working for an HVAC manufacturer's representative. He is experienced in the selection and sizing of chillers, air handlers, variable refrigerant volume systems, cooling towers, fluid coolers, heat exchangers, humidifiers, etc., as well as mechanical and plumbing system design and project management. Member—American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)

H. RELEVANT PROJECTS

	(1) TITLE AND LOCATION (<i>City and State</i>)	(2) Year Completed	
		Professional Services	Construction (<i>if applicable</i>)
1)	Arizona State University Lattie F. Coor Hall Generator Reliability Phase 2 Upgrades, Tempe, AZ	2012	2013
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Mechanical designer for the New redundant system A/system B UPS systems and distribution to MDF and IDF loads with dual power supplies, each backed up with generator power. Backup cooling systems on emergency power added to each IDF. PROJECT SIZE: 6,000 sq. ft.; \$1.63 million.		
2)	Arizona State University ISTB1 Reliability Phase 2B, Tempe, AZ	2012	2013
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Mechanical designer for the New redundant systems A/system B UPS systems and distribution to data center, MDF and IDF rooms. Backup cooling systems with emergency power added. PROJECT SIZE: 90,000 sq. ft.; \$4.1 million.		
3)	Arizona State University SHESC Lab Renovation, Tempe, AZ	2012	2012
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Mechanical designer for HVAC upgrades and maceration lab remodel. PROJECT SIZE: 4,400 sq. ft.; \$450,000.		
4)	Arizona State University Bookstore HVAC Upgrade, Tempe, AZ	2012	2012
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Mechanical designer for the HVAC and building control upgrades for sales floor and server room. PROJECT SIZE: 17,100 sq. ft.; \$363,000.		
5)	Arizona Regional Medical Center, Apache Junction, AZ	2008	2010
	(3) BRIEF DESCRIPTION (<i>Brief scope, size, cost, etc.</i>) AND SPECIFIC ROLE <input type="checkbox"/> Check if project performed with current firm Mechanical designer. Converted a physician's office into a full service hospital with 30 beds. ROLE: Mechanical designer. PROJECT SIZE: 32,000 sq. ft.		



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Phoenix, Arizona 85007**

5. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present no more than five (5) projects. Complete one Section 5 for each project.)

a. TITLE AND LOCATION <i>(City and State)</i> Joint Agency Traffic Management Center, City and County of Honolulu, Hawaii	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES 2013	CONSTRUCTION <i>(If applicable)</i> 2014 (expected)

23. PROJECT OWNER'S INFORMATION

c. PROJECT OWNER City and County of Honolulu, Hawaii	d. DOLLAR AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
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f. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and length of project)

The Honolulu Joint Traffic Management Center (JTMC) is a new building that will bring transportation operations and emergency responder communications personnel (and their operations systems) together for the purpose of improving traffic management on Oahu. A Concept of Operations was developed to provide guidance to the JTMC Steering and Executive Committees for developing the project leading to development of a Joint Traffic Management Center Master Plan. The Master Plan helped to define the project in terms of potential size, costs, opportunities, and challenges. During this time frame, Steering Committee members toured and benchmarked several mainland JTMC facilities.

A three-layered system from least restrictive public and staff areas to most restrictive computer and operations centers utilizing multiple CCTV security cameras and door access systems all routed through a central security office.

The team was challenged to design suitable stand-off distances from public access per the minimum requirements of Unified Facilities Criteria (UFC) DoD Minimum Antiterrorism Standards for Buildings and integration of COPS (Critical Operations Power Systems) on a small urban in-fill site adjacent to a major public transportation node.



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5. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present no more than five (5) projects. Complete one Section 5 for each project.)

a. TITLE AND LOCATION <i>(City and State)</i> City of Mesa Metro Division Cut and Reface Projects	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES 2013	CONSTRUCTION <i>(If applicable)</i>

23. PROJECT OWNER'S INFORMATION

c. PROJECT OWNER City of Mesa	d. DOLLAR AMOUNT OF PROJECT \$42,800 (Spectrum's fee)	a. TOTAL COST OF PROJECT \$42,800 (Spectrum's fee)
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f. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and length of project)

Spectrum Engineers is providing mechanical, electrical and plumbing (MEP) engineering for this project, which involves widening and modifications to Main Street in downtown Mesa, Arizona to accommodate the Metro Light Rail extension through town. The new line will run along the Center of Main Street. Main Street is being widened into buildings, requiring the removal and relocation of HVAC units and other utilities as buildings are being "cut back." Spectrum Engineers is re-establishing power, HVAC and plumbing systems, that meet current code requirements, to the remaining portion of buildings. Coordination with architectural, structural, and civil landscapes was also essential.



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5. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present no more than five (5) projects. Complete one Section 5 for each project.)

a. TITLE AND LOCATION <i>(City and State)</i> Arizona State University Lattie F. Coor Hall Generator Reliability, Phase 2B, Tempe, AZ	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES 2013	CONSTRUCTION <i>(If applicable)</i> 2014 (expected)

23. PROJECT OWNER'S INFORMATION

c. PROJECT OWNER Arizona State University	d. DOLLAR AMOUNT OF PROJECT \$1.6 million	b. TOTAL COST OF PROJECT \$1.6 Million
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f. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and length of project)

Spectrum Engineers is currently providing mechanical, electrical and plumbing (MEP) engineering services for Coor Hall to improve systems reliability. Coor Hall is home to advanced mediated classrooms, traditional classrooms, open computer labs, research, survey research, special purpose facilities and offices. This project consisted of upgrading the HVAC and electrical infrastructure for the Intermediate Data Frame (IDF) and Main Data Frame (MDF) rooms within the facility. This includes installation of mechanical split systems, standby generator, and redundant automatic transfer switches and UPS systems to all critical loads. The mechanical and electrical systems are anticipated to be monitored by the central plant. Spectrum Engineers designed new redundant system A/system B UPS systems and distribution to MDF and IDF loads with dual power supplies, each backed up with generator power. Backup cooling systems on emergency power were added to each IDF.



Project size: 6,000 sq. ft.



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5. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present no more than five (5) projects. Complete one Section 5 for each project.)

a. TITLE AND LOCATION <i>(City and State)</i> Arizona State University Reliable Power Study, Gap Analysis, Master Plan, and Priority 1 Upgrades, Tempe, AZ	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES 2009	CONSTRUCTION <i>(If applicable)</i> NA

23. PROJECT OWNER'S INFORMATION

c. PROJECT OWNER Arizona State University	d. DOLLAR AMOUNT OF PROJECT \$587,869.55	e. TOTAL COST OF PROJECT \$587,869.55
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f. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and length of project)

As the prime A/E, Spectrum Engineers prepared a master plan complying with the university's standard for reliability that establishes a campus standard of uptime requirements for equipment and facilities. The ASU standard for reliability (ASR) is based on an exhaustive campus-wide power reliability study conducted by Spectrum that documented and evaluated major stakeholder needs, especially those related to research, and existing power conditions.

Based upon the data that Spectrum acquired, the existing distribution, generation and utility systems were analyzed for gaps which pose risk of outage. Using SKM software, a load flow study, voltage drop study and an ARC flash study were performed to determine noncompliant components in accordance with the ASR. A failure modes and effects analysis was performed and included a survey of cooling infrastructure, access security and other related gaps that increase the risk of downtime. A study of the existing SF6 switches was included and a report was issued detailing these results.



Using the SKM software for the existing power infrastructure, a master plan document was prepared with proposed modifications to the infrastructure including schedule and cost to meet the requirements of the ASR. The final master plan document presented future proposed upgrades to campus infrastructure with associated costs and schedules.



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5. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present no more than five (5) projects. Complete one Section 5 for each project.)

<p>b. TITLE AND LOCATION <i>(City and State)</i> Arizona State University Student Engagement Center at Downtown Post Office, Mechanical & Electrical Utilities Replacement</p>	<p>b. YEAR COMPLETED</p> <table border="1"> <tr> <td data-bbox="980 495 1252 569"> <p>PROFESSIONAL SERVICES 2011</p> </td> <td data-bbox="1252 495 1557 569"> <p>CONSTRUCTION <i>(If applicable)</i> 2012</p> </td> </tr> </table>		<p>PROFESSIONAL SERVICES 2011</p>	<p>CONSTRUCTION <i>(If applicable)</i> 2012</p>
<p>PROFESSIONAL SERVICES 2011</p>	<p>CONSTRUCTION <i>(If applicable)</i> 2012</p>			

23. PROJECT OWNER'S INFORMATION

<p>c. PROJECT OWNER Arizona State University</p>	<p>d. DOLLAR AMOUNT OF PROJECT \$120,000</p>	<p>e. TOTAL COST OF PROJECT \$120,000</p>
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g. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and length of project)

Spectrum Engineers provided mechanical, electrical and plumbing (MEP) engineering for this project.

The existing obsolete APS electrical service from an underground building vault is being replaced with a new upgraded 480/277 3 phase electrical service from a pad mounted transformer to a new switchboard sized for the new building loads in a dedicated main electrical room. The post office is a historical building so the location of the pad mounted transformer was a sensitive issue. After reviewing multiple alternatives, it was determined to adapt the existing cooling tower enclosure and change its use to be the transformer enclosure which included minimal modification to the pedestal base and modifying the existing architectural louver to comply with APS requirements.

In addition, chilled water is being extended by Northwind from the district cooling facilities into the building. Equipment and piping modifications and coordination are required to interface this work with the existing building's chilled water system. This includes removal of the chillers, cooling tower and associated piping along with minimizing the downtime required for the existing building.



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6. ADDITIONAL INFORMATION

a. PROVIDE ANY ADDITIONAL INFORMATION YOU FEEL MAY BE NECESSARY TO DESCRIBE YOUR FIRMS QUALIFICATIONS. (ATTACH ADDITIONAL SHEETS AS NEEDED.)

Founded in 1982, Spectrum Engineers is a multi-discipline consulting engineering firm based in Salt Lake City, Utah with offices in Phoenix, Arizona and Baltimore, Maryland. Spectrum has been named as one of the Top 100 Green Design Firms in America in June 2015 by *Engineering News-Record*. For 13 consecutive years, Spectrum has been ranked in the top 100 of *Consulting-Specifying Engineer's* MEP Giants list (#84 in 2015). We provide client-centered electrical, mechanical, acoustical and fire protection engineering in addition to technology, lighting and theatre design services throughout the United States and at various locations around the world. Our staff includes:

- 22 Professional Engineers (PEs)
- 10 Engineers-in-Training (EITs)
- 4 Interns
- 6 Technology designers, including:
 - one Acoustician
 - one who is Network Transport System (RCDD/NTS) certified
 - two who are Certified Technology Specialists in Design (CTS-Ds), Crestron Digital Media Certified Designers (DMC-Ds) and Extron XTP Certified Engineers (XTP-Es)
 - one who is an AV 9000 Certified Quality Assurance Technician (CQT)
- 1 Certified (CPD/CIPE) plumbing designers
- 1 Certified GeoExchange Designer (CGD) HVAC designer
- 2 Lighting certified (LC) lighting designers
- 14 LEED Accredited Professionals (APs) and 1 LEED Green Associate
- 27 Other professionals including 15 CAD technicians
- 1 Accredited Tier Designer (ATD)

We provide concentrated focus by aligning like-minded individuals into design communities called Centers of Engineering Excellence (CEEs). Because each CEE member is committed to following the issues, trends and innovations affecting a specific project type, clients receive designs provided by professionals with extensive experience and knowledge in designing similar projects. The professionals comprising Spectrum's CEEs are passionate about the project types upon which they are focused. This structure helps us ensure clients will benefit from integrated services leading to reduced change orders, and therefore, cost. Spectrum's organization encourages communication and collaboration among a group of engineers and designers who are accustomed to working alongside one another on specific project types—from government to higher education to healthcare. This fosters free-flow of ideas and information, helping design teams achieve project success. Innovation, advanced yet proven solutions and intuitive functionality are products of our organization.

Although we are organized along project types, we understand that no two projects are ever identical. That is why each CEE member is dedicated to understanding the expectations and goals that an owner has for a project and tailoring design solutions to fit each project. It is this combination of experience, individual attention and passion that sets Spectrum Engineers apart.



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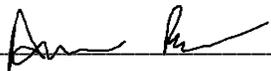
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7. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS

a. Percentage of Total Work Attributable to State, Federal and Municipal Government Work:	20%
b. Percentage of Total Work Attributable to Non-Government Work:	80%

8. AUTHORIZED REPRESENTATIVE. The foregoing is a statement of facts.

Signature: 

Date: December 21, 2015

Name: Aaron Ricks

Title: Principal-in-Charge/Principal Electrical Engineer