(If a firm has branch offices, complete for each specific branch office seeking work.)

1. ***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:	AZ
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:	1982
j. POINT OF CONTACT E-MAIL ADDRESS:	alr@spectrum-engineers.com

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

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	2
Fire Protection Engineer	P	1	1
Architectural Engineer	P	2	1
Technology Designer	P	6	2
Total		38	9

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)*
28	A01 Acoustics; Noise	1
6	A06 Airports; Terminals; Hangars	1
7	A11 Auditoriums; Theatres	1
118	C06 Churches; Chapels	3
49	C10 Commercial Building low rise; Shopping Centers	2
23	C11 Community Facilities	2
8	C13 Computer Facilities; Computer Service	1
32	D07 Dining Halls; Clubs; Restaurants	2
76	E02 Educational Facilities; Classrooms	6
4	F02 Field Houses; Gyms; Stadiums	2
26	G01 Garages; Vehicle Maintenance Facilities; Parking Decks	3
170	H09 Hospitals and Medical Facilities	5
32	H10 Hotels; Motels	3
24	H11 Housing (Residential; Multifamily; Apartments; Condominiums)	3
32	I01 Industrial Buildings; Manufacturing Plants	3
42	J01 Judicial and Courtroom Facilities	4
9	L01 Laboratories; Medical Research Facilities	2
9	L04 Libraries; Museums; Galleries	2
173	O01 Office Buildings; Industrial Parks	5
6	P08 Prisons and Correctional Facilities	1
2	P12 Power Generation; Transmission, Distribution	1
3	R01 Radar; Sonar; Radio & Radar Telescopes	1
28	T02 Testing & Inspection Services	4
29	U03 Utilities (Gas & Steam)	2
5	V01 Value Analysis; Life Cycle Costing	1

PROFESSIONAL SERVICES REVENUE INDEX NUMBER

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

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

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
AARON RICKS, P.E., LEED AP	Principal-in-Charge / Principal Electrical Engineer	1. TOTAL: 12	2. WITH CURRENT FIRM: 5

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

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
Bachelor of Science Electrical Engineering	Registered Professional Engineer: Arizona #48564 Registered Professional Engineer: California #20961 Registered Professional Engineer: Nevada #019933

g. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*
Mr. Ricks is a professional engineer (P.E.) with 12 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 Guidelines for Design and Construction of Hospitals and Outpatient Facilities, National Electric Code, NFPA, IEE, IECC and ASHRAE as well as AutoCAD software.

H. RELEVANT PROJECTS

1.

(1) TITLE AND LOCATION *(City and State)*: Joint Traffic Management Center and Emergency Operations Center (JTMC+EOC) Planning/Programming, Honolulu, HI

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2014 — CONSTRUCTION *(If applicable)*: Current

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☒ Check if project performed with current firm

The JTMC+EOC is a new 56,000 sq. ft., $50 million building that will bring transportation, operations, and emergency responder communications personnel (and their operations systems) together for the purpose of improving traffic management in Oahu. It is a three phase, multi-year project which houses the following: City Department of Transportation, State Department of Transportation Highways Division, Honolulu Fire Department, Honolulu Police Department's Traffic Division, and Emergency Management Division. The structure is a three level building with over 400 parking stalls to accommodate bus service and customers.

2.

(1) TITLE AND LOCATION *(City and State)*: City of Mesa Metro Division Cut and Reface Projects, Mesa, AZ

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2013 — CONSTRUCTION *(If applicable)*: 2014

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☒ Check if project performed with current firm

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.

3.

(1) TITLE AND LOCATION *(City and State)*: City of Mesa Police Department Shooting Range Building Replacement, Mesa, AZ

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2014 — CONSTRUCTION *(If applicable)*: Current

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☒ Check if project performed with current firm

Electrical engineer for replacement of maintenance and ammunitions building, with new 5,000 sq. ft. building including office space, maintenance and storage space, as well as high security for Gun Room, Armory and Ammo Room. Spectrum provided full electrical, mechanical, and plumbing engineering services. Construction administration services will be provided when the project gets to that phase.

4.

(1) TITLE AND LOCATION *(City and State)*: Arizona State University Lattie F. Coor Hall, Tempe, AZ

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2013 — CONSTRUCTION *(If applicable)*: 2014

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☒ Check if project performed with current firm

Principal 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. Mr. Ricks 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. 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

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

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
LARRY L. HACKLEMAN, PE, LEED AP, CxA, QCxP	Mechanical and Electrical Engineer	1. TOTAL: 22	2. WITH CURRENT FIRM: 2

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

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
Bachelor of Science Architectural Engineering	Registered Professional Engineer: Arizona #41990 - Electrical Registered Professional Engineer: Arizona #38532 - Mechanical Registered Professional Engineer: Kansas #14389 - Electrical and Mechanical LEED AP - United States Green Building Council (USGBC) Leadership in Energy and Environmental Design, Accredited Professional QCxP - University of Wisconsin at Madison, Qualified Commissioning Process Provider Certified Commissioning Authority (CxA) / AABC Commissioning Group (ACG)

g. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*
Mr. Hackleman has more than 20 years of electrical and mechanical engineering experience, with an emphasis in electrical engineering design and management, as well as three years of commissioning experience for LEED and non-LEED projects. He is a focused and diligent individual, accustomed to responsibility. He has a strong sense of character and commitment to continual learning and self-improvement. He appreciates the science of engineering, the art of architecture and the importance of integrating the two. He is skilled in project management, engineering design, commissioning, and supervising personnel. He has a successful record of meeting deadlines and budgets, and following projects through completion. He is experienced in acting as a liaison between the MEP design team, architects and contractors and extensive experience in project management, group management, new construction, renovation, design-build, and Integrated Project Delivery teaming.

- Member – IES, IEEE, ASHE

H. RELEVANT PROJECTS

	(1) TITLE AND LOCATION *(City and State)*	(2) YEAR COMPLETED: PROFESSIONAL SERVICES	(2) YEAR COMPLETED: CONSTRUCTION *(If applicable)*
1.	Arizona State University Lattie F. Coor Hall, Tempe, AZ	2013	2014
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☒ Check if project performed with current firm Mr. Hackleman is the Principal Electrical Commissioning Authority for this 6,000 SF, $1.6M project. It involved a 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.		
2.	(1) TITLE AND LOCATION *(City and State)* Arizona State University ISTB1 Data Center, Tempe, AZ	(2) YEAR COMPLETED: PROFESSIONAL SERVICES 2012	(2) YEAR COMPLETED: CONSTRUCTION *(If applicable)* 2013
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☒ Check if project performed with current firm Principal Electrical Commissioning Authority for project to provide emergency generator and segregate emergency distribution to a separate system in an existing 90,000 SF building (approximate), $4 million research facility and data center.		
3.	(1) TITLE AND LOCATION *(City and State)* Arizona State University Student Recreation Center Expansion, Tempe, AZ	(2) YEAR COMPLETED: PROFESSIONAL SERVICES 2012	(2) YEAR COMPLETED: CONSTRUCTION *(If applicable)* 2013
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☐ Check if project performed with current firm Electrical commissioning authority for 84,500 sf expansion including wellness, strength, fitness and cardio rooms, as well as multipurpose gymnasium and locker rooms. Completed site visits and provided issue logs.		
4.	(1) TITLE AND LOCATION *(City and State)* Thunderbird School of Global Management – Historic Aviation Tower Building Remodel, Glendale, AZ	(2) YEAR COMPLETED: PROFESSIONAL SERVICES 2010	(2) YEAR COMPLETED: CONSTRUCTION *(If applicable)* 2011
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☒ Check if project performed with current firm Project manager and electrical commissioning authority for an 8,000 SF renovation of abandoned airfield control tower into a student pub, gallery, lounge space and gift shop.		

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

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
		1. TOTAL	2. WITH CURRENT FIRM
AUSTIN D. ABNEY, P.E., LEED AP	Project Mechanical Engineer	7	2

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

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
Bachelor of Science Mechanical Engineering	Registered Professional Engineer (P.E.) / Arizona #58103 Leadership in Energy and Environmental Design Accredited Professional (LEED AP)

g. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*
Mr. Abney has three 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.

(1) TITLE AND LOCATION *(City and State)*: Arizona State University Lattie F. Coor Hall, Tempe, AZ

(2) YEAR COMPLETED: PROFESSIONAL SERVICES 2013 | CONSTRUCTION *(If applicable)* 2014

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

(1) TITLE AND LOCATION *(City and State)*: City of Mesa Police Department Shooting Range Building Replacement, Mesa, AZ

(2) YEAR COMPLETED: PROFESSIONAL SERVICES 2014 | CONSTRUCTION *(If applicable)* Current

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE ☒ Check if project performed with current firm

Project mechanical engineer for replacement of maintenance and ammunitions building, with new 5,000 sq. ft. building including office space, maintenance and storage space, as well as high security for Gun Room, Armory and Ammo Room. Spectrum provided full electrical, mechanical, and plumbing engineering services. Construction administration services will be provided when the project gets to that phase.

3.

(1) TITLE AND LOCATION *(City and State)*: City of Mesa Metro Division Cut and Reface Projects, Mesa, AZ

(2) YEAR COMPLETED: PROFESSIONAL SERVICES 2013 | CONSTRUCTION *(If applicable)* 2014

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE ☒ Check if project performed with current firm

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.

4.

(1) TITLE AND LOCATION *(City and State)*: Arizona State University Trovitch Lab and SHESC Lab HVAC Upgrades, Mesa, AZ

(2) YEAR COMPLETED: PROFESSIONAL SERVICES 2012 | CONSTRUCTION *(If applicable)* 2014

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE ☒ Check if project performed with current firm

Mechanical designer for HVAC upgrades and lab remodels. Both projects began as studies to correct ailing HVAC infrastructure issues. Following the studies, Spectrum completed successful, high-performance designs for upgrades to the HVAC systems that were implemented. Trovitch Lab HVAC Upgrades: Spectrum's mechanical engineers employed fabric lab ductwork to evenly distribute the large amount of makeup air to the lab without causing drafts for compliance with ANSI/AIHA Z9.5-2003 and the ANSI/ASHRAE 110 test for installation of energy efficient hoods. This innovation has also made this one of the quietest labs in the building due to reduced airflow noise. SHESC 3rd Floor HVAC Upgrades: For this project Spectrum was asked to study the building HVAC systems for deficiencies that were causing comfort control complaints. Spectrum's engineers were able to provide an innovative 3-step "variable" exhaust flow system utilizing user-switched exhaust fans. These exhaust systems are only intermittently used for the processes employed in the lab. The VAV terminal supplying the lab provides only the necessary airflow based on the current exhaust requirement of the lab.

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

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
Stewart "Skip" Greene	Electrical Project Manager	1. TOTAL: 40	2. WITH CURRENT FIRM: 40

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

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
B.S. Electrical Engineering	Registered Professional Engineer / Utah #170193

g. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*
Stewart E. "Skip" Greene is the CEO, Chairman of the Board, and founder of Spectrum Engineers, Utah's largest integrated mechanical/electrical/technology engineering firm. Skip is a registered Professional Engineer in multiple states with more than 40 years of experience in the design of electrical systems for the built environment. As CEO he has been assigned the responsibility for the development of the Tempe, Arizona office which includes training, management, and project management. Mr. Greene has honed his interpersonal skills. 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 a project of this magnitude will require.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.

(1) TITLE AND LOCATION *(City and State)*: Joint Traffic Management Center and Emergency Operations Center (JTMC+EOC) Planning/Programming, Honolulu, HI

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2014 — CONSTRUCTION *(If applicable)*: Current

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☒ Check if project performed with current firm

Principal-in-charge of electrical engineering for this facility program, conceptual design, design-build peer review, of a new 56,000 sq. ft., $50 million building that will bring transportation, operations, and emergency responder communications personnel (and their operations systems) together for the purpose of improving traffic management in Oahu. It is a three phase, multi-year project which houses the following: City Department of Transportation, State Department of Transportation Highways Division, Honolulu Fire Department, Honolulu Police Department's Traffic Division, and Emergency Management Division. The structure is a three level building with over 400 parking stalls to accommodate bus service and customers.

2.

(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)*: 2013

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

3.

(1) TITLE AND LOCATION *(City and State)*: Arizona State University ISTB 1, Tempe, AZ

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2013 — CONSTRUCTION *(If applicable)*: 2013

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

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

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
David E. Wesemann, PE, LEED AP	Principal Electrical Engineer	1. TOTAL: 24	2. WITH CURRENT FIRM: 24

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

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
B.S. Electrical Engineering	Registered Professional Engineer is 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 24 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. 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. 50+ awards and award-winning projects.

H. RELEVANT PROJECTS

1.

(1) TITLE AND LOCATION *(City and State)*: Arizona State University Reliable Power Study, Gap Analysis, and Master Plan, Tempe, AZ

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2009 | CONSTRUCTION *(If applicable)*: N/A

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

2.

(1) TITLE AND LOCATION *(City and State)*: University of Utah Campus Wide Electrical Utility Distribution Upgrade, Salt Lake City, UT

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2013 | CONSTRUCTION *(If applicable)*: Current

(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.

3.

(1) TITLE AND LOCATION *(City and State)*: Salt Lake Public Safety Building, Salt Lake City, UT

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2011 | CONSTRUCTION *(If applicable)*: 2013

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☒ Check if project performed with current firm

The $125 million Public Safety Complex comprises 175,480 sq. ft. of space, on four levels above ground, to house 276 police employees, 69 emergency dispatchers, 38 fire employees, and four workers with the emergency management division. Inside is a large video wall created from 77 LED illuminated tiles. The remainder of the site is a public plaza space. Two levels below-grade, enclosed, and secure, the parking structure accommodates 372 vehicles and 30 motorcycles. The Salt Lake Public Safety Complex not only is LEED® Silver, but is net-zero.

4.

(1) TITLE AND LOCATION *(City and State)*: State of Utah Capitol Restoration and Capitol Hill Central Utility Plant and Distribution, Salt Lake City, UT

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2005 | CONSTRUCTION *(If applicable)*: 2008

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☒ Check if project performed with current firm

The approximately $11.6 million Capitol Hill Central Plant houses Spectrum-designed high-efficiency boilers and chillers, variable flow pumps and backup power generation and other systems. The central plant serves the newly restored and seismically upgraded Utah State Capitol (330,000 GSF) and three other buildings: the new Senate Expansion Office and Legislative Expansion Office buildings (185,000 sq. ft., both buildings), and the existing State Office Building. Spectrum Engineers provided the electrical engineering services for this historically sensitive project.

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

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
		1. TOTAL	2. WITH CURRENT FIRM
MICHAEL E. IZATT, CTS-D, DMC-D, XTP-E	Project Technologist	15	9

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

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
B.S. Electronic Engineering Technology	

g. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*
Mr. Izatt is an Audiovisual Designer/Engineer with 15 years of experience in audiovisual design and integration, including client relations, space planning, system design, construction administration, vender liaison and integrator coordination, system calibration and commissioning, and live audiovisual/sound reinforcement applications. He works closely with clients and equipment manufacturers to establish business relationships, evaluate client technical needs, determine project requirements, and select appropriate solutions. He carefully coordinates with multiple disciplines in design work to meet the needs

H. RELEVANT PROJECTS

1.

(1) TITLE AND LOCATION *(City and State)*: State of Utah Capitol Office Buildings and Capitol Building Restoration, Salt Lake City, UT

(2) YEAR COMPLETED: PROFESSIONAL SERVICES 2005 | CONSTRUCTION *(If applicable)* 2008

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☒ Check if project performed with current firm

Technology Designer for technical media systems and infrastructure design. This project comprised Senate and House chambers, as well as various committee, training, conference, and press and media rooms. Responsibilities included assisting senior designers with multiple aspects of the design phase including, research, infrastructure coordination, and creating AutoCAD drawings and other bidding documentation. The total equipment, cabling, and infrastructure valued approximately $5,200,000

2.

(1) TITLE AND LOCATION *(City and State)*: University of Utah Health Sciences Education Center, Salt Lake City, UT

(2) YEAR COMPLETED: PROFESSIONAL SERVICES 2004 | CONSTRUCTION *(If applicable)* 2006

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☒ Check if project performed with current firm

Designer for technical media systems design and installation support. This project comprised 30 teaching labs (“pods”) and various classroom and training room audiovisual presentation systems. Responsibilities included assisting the senior designer with multiple aspects of the design and administration processes including creating AutoCAD drawings, compiling other bidding and contract documentation, research, and system commissioning and inspections. The total equipment and cabling value of approximately $185,000

3.

(1) TITLE AND LOCATION *(City and State)*: Intermountain Medical Center, Murray, UT

(2) YEAR COMPLETED: PROFESSIONAL SERVICES 2006 | CONSTRUCTION *(If applicable)* 2008

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☒ Check if project performed with current firm

Mr. Izatt acted as Assistant Technology Designer for technical media systems. This project comprised numerous patient rooms, surgical suites, training and conference rooms, and campus-wide paging. Responsibilities included assisting senior designers with multiple aspects of the design phase including, research, infrastructure coordination, and creating AutoCAD drawings and other bidding documentation. Budget: approximately $4,000,000.

4.

(1) TITLE AND LOCATION *(City and State)*: LDS Various Religious Meetinghouses Nationwide

(2) YEAR COMPLETED: PROFESSIONAL SERVICES Various | CONSTRUCTION *(If applicable)* Various

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☒ Check if project performed with current firm

Mr. Izatt served as the Audiovisual Consultant for the audio and video system design. Responsibilities included assisting senior designers with multiple aspects of the design phase including meeting with the client to determine the project scope of work, research, infrastructure coordination, creating AutoCAD drawings, bills of materials, specifications and other bidding documentation, and performing final commissioning, testing, and inspections of the installed system after construction had been completed.

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

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
		1. TOTAL	2. WITH CURRENT FIRM
Jeffrey DuBois, PE, FPE	Fire Protection Engineer	19	8

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

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
B.S. Mechanical Engineering	Registered Fire Protection Engineer / Arizona / #46296 Registered Professional Engineer / Utah / #265949-2202 / 2001 Registered Professional Engineer / Illinois / # 062-055530 / 2002 Registered Professional Engineer / Maryland / #38578 / 2010 Registered Professional Engineer / Colorado / #0047824

g. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*
Jeff DuBois, P.E., FPE, is a principal and licensed fire protection engineer (F.P.E.) and licensed professional mechanical engineer (P.E.) with 18 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 retail, commercial, residential, state and military facilities and fire suppression system upgrades for more than 200 remodeled retail, commercial, state, school, and military projects. Jeff 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. Jeff 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.

H. RELEVANT PROJECTS

1.

(1) TITLE AND LOCATION *(City and State)*
Honolulu Joint Traffic Management Center / Emergency Operations Center (JTMC + EOC), Honolulu, HI

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2014	Current

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE ☒ Check if project performed with current firm

The JTMC+EOC is a new 56,000 sq. ft., $50 million building that will bring transportation, operations, and emergency responder communications personnel (and their operations systems) together for the purpose of improving traffic management in Oahu. It is a three phase, multi-year project which houses the following: City Department of Transportation, State Department of Transportation Highways Division, Honolulu Fire Department, Honolulu Police Department's Traffic Division, and Emergency Management Division. The structure is a three level building with over 400 parking stalls to accommodate bus service and customers.

2.

(1) TITLE AND LOCATION *(City and State)*
Administrative Office of the Courts 2nd District Juvenile Courthouse, Ogden, UT

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2013	Current

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE ☒ Check if project performed with current firm

Mr. DuBois provided fire protection for the new 2nd District Juvenile Courthouse, five story, 88,200 SF structure with eight courtrooms, two on each of the upper four levels. Probation, clerical, mediation, and support are located on the ground floor level. Spectrum Engineers was the engineer of record for the electrical, lighting design, and technology systems including security, voice/data communications, and audio/visual systems. Spectrum also provided acoustical engineering services.

3.

(1) TITLE AND LOCATION *(City and State)*
Salt Lake Public Safety Building, Salt Lake City, UT

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2011	2013

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE ☒ Check if project performed with current firm

The $125 million Public Safety Complex comprises 175,480 sq. ft. of space, on four levels above ground, to house 276 police employees, 69 emergency dispatchers, 38 fire employees, and four workers with the emergency management division. Inside is a large video wall created from 77 LED illuminated tiles. The remainder of the site is a public plaza space. Two levels below-grade, enclosed, and secure, the parking structure accommodates 372 vehicles and 30 motorcycles. The Salt Lake Public Safety Complex not only is LEED® Silver, but is net-zero.

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

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
Ray W. Moore, PE, CPD, LEED AP, FASPE	Principal Mechanical & Plumbing Engineer	1. TOTAL: 44	2. WITH CURRENT FIRM: 7

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

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
B.S. Civil Engineering	Registered Professional Engineer in 8 States including Arizona # 22734

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.

H. RELEVANT PROJECTS

1.

(1) TITLE AND LOCATION *(City and State)*: Utah Transit Authority (UTA) Maraini Distribution Steam Pipe &Boiler Upgrade

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2008 — CONSTRUCTION *(If applicable)*: 2009

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☒ Check if project performed with current firm

Principal mechanical and plumbing engineer for this relocation of a 40,000 square foot distribution system to allow for relocation of UTA's right-of-way. The relocation's an existing steam boiler and installation of low pressure steam system to heat bulk fluid distribution system in the winter months.

2.

(1) TITLE AND LOCATION *(City and State)*: Salt Lake City Corporation Streets and Fleets (Public Service Maintenance) Facility, Salt Lake City, UT

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2008 — CONSTRUCTION *(If applicable)*: 2011

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☒ Check if project performed with current firm

The $23 million Salt Lake City Corporation Streets and Fleets (Public Service Maintenance) Facility encompasses two buildings: an office and maintenance facility and a remodel of the streets and fleets facility. Spectrum designed mechanical and plumbing engineering for office (39,500 sq. ft. Streets building) and vehicle maintenance facility that includes truck wash, car wash and fueling center. Project is LEED® registered and pursuing LEED® Silver. The 26-bay, 67,800 sq. ft. maintenance facility (Fleets) building includes overhead hose reel exhaust system for the light maintenance shop. There is also a carbon monoxide and hydrocarbon controlled exhaust system for the light and heavy maintenance areas. The Fleets facility will service all of the city's vehicles including fire engines and heavy and light maintenance vehicles. Spectrum also provided fire protection engineering services including specifying sprinklers and clean agent for facility, including the city's backup server room (located at the Streets and Fleets site), which is designed to take over functions in the event the main server facility should ever go down. Plumbing system provide domestic water, compressed air and lube and oil piping to vehicle service bays in the Light Vehicle (cars) shop and the Heavy Vehicle (diesel) shop.

3.

(1) TITLE AND LOCATION *(City and State)*: Orem City Energy Upgrade, Orem, UT

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2010 — CONSTRUCTION *(If applicable)*: 2011

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

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

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
Sarah Rollins, MS, INCE	Acoustician	1. TOTAL: 7	2. WITH CURRENT FIRM: 2

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

e. EDUCATION *(DEGREE AND SPECIALIZATION)*
- M.S. Physics, Acoustics Emphasis
- B.S. Applied Physics, Acoustics Emphasis

f. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*

g. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*
Ms. Rollins possesses more than seven 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.
- Crestron DigitalMedia Certified Designer (DMC-D) / Certification #D-132-130429-7981
- Extron Certified XTP Systems Engineer (XTP-E)
- Member—Acoustical Society of America (ASA) / Member since 2003
- Member – Synergetic Audio Concepts (Syn-Aud-Con) / Member since 2013

H. RELEVANT PROJECTS

	(1) TITLE AND LOCATION *(City and State)*	(2) YEAR COMPLETED: PROFESSIONAL SERVICES	(2) YEAR COMPLETED: CONSTRUCTION *(If applicable)*
1.	University of Utah S.J. Quinney Law School Building, Salt Lake City, UT	2013	2015 (expected)
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☒ Check if project performed with current firm		
	Project Acoustian on the new 156,000 square foot, 6-level Law Building. This project included innovative sustainable features such as translucent photovoltaic panels making up the roof canopy, integrated lighting controls, integrated shade systems, 100% LED lighting throughout, and electric car charging stations. The project was designed to meet LEED Silver with on-site energy and measurement and verification systems in place. Power distribution included relocation of 15kV medium voltage ductbank, two 15kV fed distribution transformers, and a large standby diesel generator system. Innovative lighting solutions were required for the 6 story atrium space.		
2.	(1) TITLE AND LOCATION *(City and State)*: Weber State University Davis Campus Professional Classroom Building Central Plant Study, Layton, UT	(2) YEAR COMPLETED: PROFESSIONAL SERVICES: 2012	(2) YEAR COMPLETED: CONSTRUCTION *(If applicable)*: N/A
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☒ 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.		
3.	(1) TITLE AND LOCATION *(City and State)*: Utah Valley University New Classroom Building, Orem, UT	(2) YEAR COMPLETED: PROFESSIONAL SERVICES: 2012	(2) YEAR COMPLETED: CONSTRUCTION *(If applicable)*: 2014
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☒ 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.		
4.	(1) TITLE AND LOCATION *(City and State)*: 2nd District Juvenile Courthouse, Ogden, UT	(2) YEAR COMPLETED: PROFESSIONAL SERVICES: 2012	(2) YEAR COMPLETED: CONSTRUCTION *(If applicable)*: 2013
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☒ Check if project performed with current firm		
	Project acoustician providing architectural acoustics and HVAC noise and vibration control recommendations for courtrooms, judges' chambers, conference rooms, holding areas, interview rooms, mediation rooms and victim/witness sequestered rooms to meet Utah Judicial Facility Design Standards in this new facility. Total construction budget: $22 million. Size: 120,000 sf		
5.	(1) TITLE AND LOCATION *(City and State)*: Wilmington Courthouse Ceiling Renovation, Wilmington, DE	(2) YEAR COMPLETED: PROFESSIONAL SERVICES: 2012	(2) YEAR COMPLETED: CONSTRUCTION *(If applicable)*: 2013
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☒ Check if project performed with current firm		
	Acoustician providing acoustic testing, analysis and remediation recommendations for an acoustic anomaly in a recently remodeled courtroom. Size: 2,150 sf		

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 *(City and State)*	b. YEAR COMPLETED	
Arizona State University Lattie F. Coor Hall (Tempe, AZ)	PROFESSIONAL SERVICES 2013	CONSTRUCTION *(If applicable)* 2014

23. PROJECT OWNER'S INFORMATION

c .PROJECT OWNER	d .ORIGINAL BUDGET/NTE AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
Arizona State University	$1,600,000	$1,600,000

f. 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 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 $1.6 million project affects approximately 6,000 sq. ft. consists 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' subsidiary, Total Building Commissioning, is providing the required building commissioning services for achieving a constructed and operating building systems that meets the design intent and occupant's expectations. Commissioning activities are proposed to be provided during the Design, Construction and Acceptance Phases of the building delivery process.

Mechanical

Several VRF (variable refrigerant flow) and mini-split systems for MDF, IDF and UPS rooms, each was designed to be backed up with generator power. Backup cooling systems on emergency power added to each IDF for reliability and redundancy.

Electrical

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.

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 *(City and State)*	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
City of Mesa Police Department Shooting Range Building Replacement (Mesa, AZ)	2014	2014

23. PROJECT OWNER'S INFORMATION

c .PROJECT OWNER	d .ORIGINAL BUDGET/NTE AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
City of Mesa		

f. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and length of project)

Replacement of maintenance and ammunitions building, with new 5,000 sq. ft. building including office space, maintenance and storage space, as well as high security for Gun Room, Armory and Ammo Room. Spectrum provided full electrical, mechanical, and plumbing engineering services as well as construction administration.

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 *(City and State)*	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
Joint Agency Traffic Management Center, City and County of Honolulu, Hawaii (Honolulu, HI)	2013	2014

23. PROJECT OWNER'S INFORMATION

c .PROJECT OWNER	d .ORIGINAL BUDGET/NTE AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
City and County of Honolulu, HI	$50,000,000	$50,000,000

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 timeframe, 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.

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.)

b. TITLE AND LOCATION *(City and State)*	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
City of Mesa Metro Division Cut and Reface Projects (Mesa, AZ)	2013	Current

23. PROJECT OWNER'S INFORMATION

c .PROJECT OWNER	d .ORIGINAL BUDGET/NTE AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
City of Mesa, AZ	$42,800 (Spectrum's fee)	$42,800 (Spectrum's fee)

g. 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.

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.)

c. TITLE AND LOCATION *(City and State)*	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
Arizona State University Reliable Power Study, Gap Analysis, Master Plan, and Priority 1 Upgrades (Tempe, AZ)	2009	N/A

23. PROJECT OWNER'S INFORMATION

c .PROJECT OWNER	d .ORIGINAL BUDGET/NTE AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
Arizona State University	$587,869.55	$587,869.55

h. 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.

This project affected the entire Tempe campus and even some off-campus facilities. Some of the most critical facilities with regard to power reliability needs are ASU's research facilities, including laboratories, science and technology classrooms and student labs. Spectrum Engineers worked closely with end-users in research and high-tech facilities to document their special power requirement needs for extremely sensitive equipment and addressed these needs in the Master Plan and Priority 1 Upgrades.

6. ADDITIONAL INFORMATION

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

Since 2006, Spectrum Engineers has maintained a Phoenix-area office:
1501 W. Fountainhead Parkway, Suite 330
Tempe, AZ 85282
480-621-3444

Spectrum Engineers will manage and staff project(s) for the State with personnel based at its well-established office in Tempe, Arizona. Nine full-time electrical, mechanical and technology engineering and design professionals work from Spectrum's Tempe, Arizona office, which has the backing of an additional 65+ engineering and design professionals working for the Salt Lake City office. Our engineers in the Tempe office are registered professional engineers (P.E.s) licensed to practice engineering in the State of Arizona. Currently, Spectrum employs 10 Arizona P.E.s.

Spectrum Engineers is a registered business in the State of Arizona.
Firm registration number: 14369-0
Arizona Department of Economics account number: 6395890-3

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 22,2014_____

Name: Aaron Ricks_____ Title: Principal Electrical Engineer_____