	ATTACHMENT I – General Qualifications **ANNUAL REQUEST FOR QUALIFICATIONS AND EXPERIENCE NO: ADSPO15-00004729**	**STATE PROCUREMENT OFFICE** **Department of Administration** **100 North 15th Avenue, Suite 201** **Phoenix, Arizona 85007**

(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:	**Affiliated Engineers, Inc.**
b. FIRM (OR BRANCH OFFICE) STREET:	4742 N 24th Street, Suite 100
c. FIRM (OR BRANCH OFFICE) CITY:	Phoenix
d. FIRM (OR BRANCH OFFICE) STATE:	Arizona
e. FIRM (OR BRANCH OFFICE) ZIP CODE:	85016

f. YEAR ESTABLISHED:	2007

(g1). OWNERSHIP - TYPE:	Corporation
(g2) OWNERSHIP - SMALL BUSINESS STATUS:	N/A

h. POINT OF CONTACT NAME AND TITLE:	**Steven J. Yanke, Principal/Managing Director**
i. POINT OF CONTACT TELEPHONE NUMBER:	602-429-5800
j. POINT OF CONTACT E-MAIL ADDRESS:	syanke@aeieng.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
CADD Technicians	P	20	2
Cost Engineer/Estimator	P	3	1
Electrical Engineer	P	79	4
Fire Protection Engineer	P	3	1
Specialist	S	50	4
Mechanical Engineer	P	168	6
Project Manager	S	48	4
Sanitary Engineer	P	29	2
Other	S	176	7
Total		**576**	**31**

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)*
2	Airports; Terminals and Hangars; Freight Handling	4
1	Area Master Planning	1
3	Construction Management	2
3	Educational Facilities; Classrooms	3
2	Electrical Studies and Design	1
2	Energy Conservation; New Energy Sources	2
3	Fire Protection	2
1	Historical Preservation	2
8	Hospital and Medical Facilities	2
8	Laboratories; Medical Research Facilities	4
6	Labs - General	2
6	Labs – Research – Dry	2
6	Labs – Research – Wet	3
2	LEED Accredited A/E	1
2	LEED Independent 3rd Party Building Commissioning	1
2	Office Buildings; Industrial Parks	1
8	Plumbing and Piping Design	2
5	Structures, Air-Support Buildings Power Generation, Transmission, Distribution Public Safety Facilities	2
4	Refrigeration Plants/Systems	2
8	Research Facilities Rehabilitation *(Buildings; Structures; Facilities)*	5
3	Security Systems; Intruder and Smoke Detection	1
5	Sustainable Design	2
4	Utilities (Gas and Steam)	1
2	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 4 for each key person.)*

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
Steven J. Yanke	**Principal-in-Charge/Electrical Engineer**	1. TOTAL **27**	1. WITH CURRENT FIRM **7**

d. LOCATION *(City and State)* **Phoenix, AZ**

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. PROFESSIONAL TRAINING - REGISTRATIONS
Bachelor of Science, Electrical Engineering, Milwaukee School of Engineering	**Registered Professional Engineer Arizona – 33014** LEED® Accredited Professional

g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)*
National Council of Examiners for Engineering and Surveying (NCEES) Record No. 12587

H. RELEVANT PROJECTS

	(1) TITLE AND LOCATION *(City and State)*	(2) YEAR COMPLETED	
		Professional Services	Construction (if applicable)
1.	**City of Phoenix – Phoenix Sky Harbor International Airport Terminal 3 Modernization – Phoenix, Arizona**	**2013-Ongoing**	**Est. 2/2018**
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE Project Manager and Electrical Engineer for the MEP design for the complete renovation of the 210,000 sf Terminal 3 at Phoenix Sky Harbor International Airport, as well as establishing overall electrical direction and electrical service design for expanded security checkpoints and a replacement South Concourse. Construction Costs: $540M (Est.) [X] Check if project performed with current firm		
2.	(1) TITLE AND LOCATION *(City and State)* **City of Phoenix – Public Works Facilities Natural Gas Generators – Phoenix, Arizona**	(2) YEAR COMPLETED Professional Services **2013-Ongoing**	Construction (if applicable) **Est. 10/2015**
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE Principal-in-Charge for piping/plumbing and electrical engineering design for new natural gas engine-generators for five City of Phoenix Public Works Department facilities throughout the city. Based upon review of existing site conditions, demands and capacities, the project team selected an appropriately-sized natural gas fueled engine/generator to support identified building and site functions. New automatic transfer switches were also provided at each facility to transfer power from the electric utility to the new engine/generator in the event utility service is lost. Provisions were also made for the connection of portable load banks for periodic generator load testing. Construction Costs: N/A [X] Check if project performed with current firm		
3.	(1) TITLE AND LOCATION *(City and State)* **Banner Good Samaritan Medical Center – Operating Suite and Central Plant Expansion – Phoenix, Arizona**	(2) YEAR COMPLETED Professional Services **2010**	Construction (if applicable) **2012**
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE Principal-in-Charge and Project Manager for a 70,000 sf renovation and two-story, multi-phased 80,000 sf addition featuring an auxiliary chiller, a steam generator, a rotary UPS system back-up, and a new 1,000-ton chiller in the existing central utility plant. Construction Costs: $31.1M [X] Check if project performed with current firm		
4.	(1) TITLE AND LOCATION *(City and State)* **Arizona State University – Vivarium HVAC/Chilled Water Reliability Study – Tempe, Arizona**	(2) YEAR COMPLETED Professional Services **2012**	Construction (if applicable) **N/A**
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE Principal-in-Charge for a reliability assessment of the HVAC and chilled water systems serving the critical animal facilities On-campus. The project also including as-built drawings of the campus central plant chilled water system and hydraulic model of the campus chilled water distribution system. Study Costs: $182,925 [X] Check if project performed with current firm		
5.	(1) TITLE AND LOCATION *(City and State)* **City of Phoenix – Information Technology (ITOC) Data Center Electrical Upgrades, Phoenix, Arizona**	(2) YEAR COMPLETED Professional Services **2011**	Construction (if applicable) **2012**
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE Principal-in-Charge for the electrical assessment and implementation of a new server rack branch circuit distribution system via new branch circuit panelboards (FDC's) located adjacent to rows of equipment. FDC's to be fed from existing "A" side UPS/PDU's and new "B" side UPS/PDU. Includes the development of a "B" side electrical distribution system including a single 300 kVa UPS and PDU. The Mechanical Design is to support the installation of "B" side UPS. Development of permit documents as well as construction phasing documents demonstrating to minimize downtime during construction. Construction Costs: $850,000 [X] Check if project performed with current firm		

4. Resumes of Key Personnel Proposed for this Contract (*Complete one Section 4 for each key person.)*

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
Bryan Jehling	**Project Manager/Electrical Engineer**	1. TOTAL **25**	2. WITH CURRENT FIRM **Joined AEI in October 2014**

d. LOCATION *(City and State)* **Phoenix, AZ**

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. PROFESSIONAL TRAINING - REGISTRATIONS
Bachelor of Science, Electrical Engineering, Northern Illinois University	**Registered Professional Engineer Arizona – 32875** LEED® Building, Design and Construction Accredited Professional

g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)*
National Council of Examiners for Engineering and Surveying (NCEES) Record No. 20042

H. RELEVANT PROJECTS

1.

(1) TITLE AND LOCATION *(City and State)*
City of Phoenix – Phoenix Sky Harbor International Airport Terminal 3 Modernization – Phoenix, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2013-Ongoing	**Est. 2/2018**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Electrical Engineer for the MEP design for the complete renovation of the 210,000 sf Terminal 3 at Phoenix Sky Harbor International Airport, as well as establishing overall electrical direction and electrical service design for expanded security checkpoints and a replacement South Concourse. Construction Costs: $540M (Est.)

[X] Check if project performed with current firm

2.

(1) TITLE AND LOCATION *(City and State)*
Banner Health – University of Arizona Health Network Master Plan – Tucson, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2014-Ongoing	**N/A**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Electrical Engineer for the development of a program for the mechanical, plumbing/piping and electrical infrastructure for a new 600,000 sf, 9-story inpatient hospital on the University of Arizona Medical Center campus. Construction Costs: N/A

[X] Check if project performed with current firm

3.

(1) TITLE AND LOCATION *(City and State)*
City of Phoenix – Public Works Facilities Natural Gas Generators – Phoenix, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2013-Ongoing	**Est. 10/2015**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Electrical Engineer for piping/plumbing and electrical engineering design for new natural gas engine-generators for five City of Phoenix Public Works Department facilities throughout the city. Based upon review of existing site conditions, demands and capacities, the project team selected an appropriately-sized natural gas fueled engine/generator to support identified building and site functions. New automatic transfer switches were also provided at each facility to transfer power from the electric utility to the new engine/generator in the event utility service is lost. Provisions were also made for the connection of portable load banks for periodic generator load testing. Construction Costs: N/A

[X] Check if project performed with current firm

4.

(1) TITLE AND LOCATION *(City and State)*
City of Chandler and HUD Housing HVAC Renovation – Chandler, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2014	**Est. 2015**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Electrical Engineer supporting electrical demolition and extension of circuiting to accommodate connection of new HVAC units at multi-building housing complex. Construction Costs: $300,000

[ ] Check if project performed with current firm

5.

(1) TITLE AND LOCATION *(City and State)*
Arizona Department of Public Safety – Peoria, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2014	**Est. 11/2017**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Electrical Engineer supporting lighting, general power, and HVAC renovation for approximately 90,000 square foot tenant improvement within an existing building. Construction Costs: $2M (Est.)

[ ] Check if project performed with current firm

4. Resumes of Key Personnel Proposed for this Contract (*Complete one Section 4 for each key person.)*

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
Jason Clausen	**Electrical Engineer**	1. TOTAL **11**	2. WITH CURRENT FIRM **2**

d. LOCATION *(City and State)* **Phoenix, AZ**

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. PROFESSIONAL TRAINING - REGISTRATIONS
Bachelor of Science, Electrical Engineering, South Dakota University	**Registered Professional Engineer Arizona – 52023**

g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)*
Construction Documents Technologist (CDT)

H. RELEVANT PROJECTS

1.

(1) TITLE AND LOCATION *(City and State)*
City of Casa Grande – Police Dispatch and Library Renovation – Casa Grande, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2013	**1/2013**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Project Manager and Electrical Engineer for this 8,500 sf, one-story renovation of an existing building into the Casa Grande Police Dispatch building and library. Scope includes electrical renovation of the dispatch area to expand the existing IT server rack capacity, provide new low-voltage lighting design, consolidate multiple uninterrupted power supplies into a single unit, and integrate new HVAC and mechanical systems, and MEP renovation of the existing library facility. Construction Costs: $1.5M

[X] Check if project performed with current firm

2.

(1) TITLE AND LOCATION *(City and State)*
Intel CH-11 Building Retro-Commissioning – Chandler, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2014-Ongoing	**N/A**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Electrical Engineer to evaluate existing conditions and performing Retro Commissioning services of Intel's 154,000 sf CH11 building. AEI performed system trending to identify existing equipment and systems that may negatively impact the energy costs for the facility and electrical trending to identify electrical consumption for each rooftop unit. AEI will support the Retro Commissioning and development of the energy conservation measures (ECM's) site survey, energy modeling, and life cycle cost analyses, cost estimation and implementation. Construction Costs: N/A

[X] Check if project performed with current firm

3.

(1) TITLE AND LOCATION *(City and State)*
University of Arizona Health Network – University of Arizona Medical Center Data Center Upgrades – Tucson, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2013	**3/2014**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Electrical Engineer for renovation to add cooling and electrical infrastructure for N+1 redundancy, supporting electronic patient medical records. Project includes computational fluid dynamic CFD modeling of the existing conditions and various options to improve airflow and reconfigure to hot aisle/cold aisle alignment. Construction Costs: $600,000

[X] Check if project performed with current firm

4.

(1) TITLE AND LOCATION *(City and State)*
Hospice of the Valley – Sherman Home Expansion – Scottsdale, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2012	**9/2013**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Electrical Engineer for mechanical, electrical and piping/plumbing design services for this 13,500 sf addition to a hospice facility on Mayo Clinic of Arizona's Scottsdale, Arizona campus. Project scope included new utility electrical service and the client requested that the pursuit of green building technologies be included in the building design. Construction Costs: N/A

[X] Check if project performed with current firm

5.

(1) TITLE AND LOCATION *(City and State)*
Banner Good Samaritan Medical Center – Hyperbaric Expansion – Phoenix, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2013-Ongoing	**Est. 1/2014**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Electrical Engineer for mechanical, electrical and piping/plumbing design of the hyperbaric expansion in the rehabilitation building at Banner Good Samaritan Medical Center, specifically renovating space to support two additional hyperbaric chambers, dressing rooms and support space. Additional scope also included renovating the main waiting room, registration desk and portions of the physical therapy area. Construction Costs:$795,000 (Est.)

[X] Check if project performed with current firm

4. Resumes of Key Personnel Proposed for this Contract (*Complete one Section 4 for each key person.*

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
Zach Goldsworthy	**Electrical Designer**	1. TOTAL **8**	2. WITH CURRENT FIRM **5**

d. LOCATION *(City and State)* **Phoenix, AZ**

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. PROFESSIONAL TRAINING - REGISTRATIONS
Bachelor of Science, Electrical Engineering, Milwaukee School of Engineering	

g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)*

H. RELEVANT PROJECTS

1.

(1) TITLE AND LOCATION *(City and State)*
City of Phoenix – Phoenix Sky Harbor International Airport – Terminal 3 Electrical Upgrades Construction Administration – Phoenix, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2009	**2010**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Electrical Designer for electrical consulting on behalf of the City of Phoenix for the construction document phase of the Terminal 3 Electrical Upgrade. Construction Costs: $11.8M

[X] Check if project performed with current firm

2.

(1) TITLE AND LOCATION *(City and State)*
City of Phoenix – Phoenix Sky Harbor International Airport – Terminal Three Parking Garage Lighting Upgrades 1-Step Design-Build Services – Phoenix, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2011	**9/2013**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Electrical Designer for a new lighting system to attain the most suitable levels of illumination while taking safety and energy conservation measures into primary consideration. The project included renovating the lighting within the elevator lobbies and stairwells and installing a separate power distribution system to allow for the APS e67 billing rate. Additional scope included replacing the existing APS transformer, and installing a new service meter for the garage infrastructure, a new step-down transformer to maintain the existing separately metered tenant's 208V system, and a 480Y/277-volt distribution panel and associated downstream lighting panels. Construction Costs: $2.1M

[X] Check if project performed with current firm

3.

(1) TITLE AND LOCATION *(City and State)*
Banner Thunderbird Medical Center –OR Renovations and Mechanical Upgrades – Glendale, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2014-Ongoing	**Est. 5/2015**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Project Manager and Electrical Designer for the OR modernization, which included complete demolition of the OR mechanical duct along with electrical infrastructure upgrades and architectural improvements. The air handler (AH-6) will be renovated by replacing the existing dual duct system with a new single duct system. The air handler will be added to the existing campus surgery chiller in a booster configuration. New master humidifiers will be added. The isolation panels in OR 1-6 and 11-15 will be replaced with new standard panelboards. All existing light fixtures within the corridor and operating rooms will be replaced with new high efficient LED light fixtures. Construction Costs: N/A

[X] Check if project performed with current firm

4.

(1) TITLE AND LOCATION *(City and State)*
Arizona State University – Vivarium HVAC/Chilled Water Reliability Study – Tempe, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2012	**N/A**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Electrical Designer for a reliability assessment of the HVAC and chilled water systems serving the critical animal facilities on campus. The project also including as-built drawings of the campus central plant chilled water system and hydraulic model of the campus chilled water distribution system. Study Costs: $182,925

[X] Check if project performed with current firm

5.

(1) TITLE AND LOCATION *(City and State)*
Maricopa Integrated Health System – Arc Flash Study – Phoenix, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2013	**N/A**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Project Manager and Electrical Designer for electrical assessment studies for the Maricopa Medical Center Campus and outpatient family health centers throughout the Maricopa Integrated Health System. Specific scope includes arc flash hazard analysis, short-circuit studies and protective device coordination analysis for the electrical distribution systems. Construction Costs: N/A

[X] Check if project performed with current firm

4. Resumes of Key Personnel Proposed for this Contract (*Complete one Section 4 for each key person.)*

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
Jeremy Barrette	**Project Manager/Mechanical Engineer**	1. TOTAL **17**	2. WITH CURRENT FIRM **4**

d. LOCATION *(City and State)* **Phoenix, AZ**

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. PROFESSIONAL TRAINING - REGISTRATIONS
Bachelor of Science, Mechanical Engineering, Oral Roberts University; Master of Science, Marketing and Technology Innovation, Worcester Polytechnic Institute	**Registered Professional Engineer Arizona – 52320** **Health Facility Design Professional – 8241101**

g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)* National Council of Examiners for Engineering and Surveying (NCEES) Record No. 47844, American Society for Healthcare Engineering (ASHE)

H. RELEVANT PROJECTS

1.

(1) TITLE AND LOCATION *(City and State)*
University of Arizona Health Network – University of Arizona Medical Center Data Center Upgrades – Tucson, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2013	**3/2014**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Project Manager and Mechanical Engineer for renovation to add cooling and electrical infrastructure for N+1 redundancy, supporting electronic patient medical records. Project includes computational fluid dynamic CFD modeling of the existing conditions and various options to improve airflow and reconfigure to hot aisle/cold aisle alignment. Construction Costs: $600,000

[X] Check if project performed with current firm

2.

(1) TITLE AND LOCATION *(City and State)*
Arizona State University – Vivarium HVAC/Chilled Water Reliability Study – Tempe, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2012	**N/A**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Project Manager and Mechanical Engineer for a reliability assessment of the HVAC and chilled water systems serving the critical animal facilities on campus. The project also including as-built drawings of the campus central plant chilled water system and hydraulic model of the campus chilled water distribution system. Study Costs: $182,925

[X] Check if project performed with current firm

3.

(1) TITLE AND LOCATION *(City and State)*
Banner Thunderbird Medical Center –OR Renovations and Mechanical Upgrades – Glendale, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2014-Ongoing	**5/2015**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Mechanical Engineer for the OR modernization, which included complete demolition of the OR mechanical duct along with electrical infrastructure upgrades and architectural improvements. The air handler (AH-6) will be renovated by replacing the existing dual duct system with a new single duct system. The air handler will be added to the existing campus surgery chiller in a booster configuration. New master humidifiers will be added. The isolation panels in OR 1-6 and 11-15 will be replaced with new standard panelboards. All existing light fixtures within the corridor and operating rooms will be replaced with new high efficient LED light fixtures. Construction Costs: N/A

[X] Check if project performed with current firm

4.

(1) TITLE AND LOCATION *(City and State)*
Banner Health – University of Arizona Health Network Master Plan – Tucson, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2014-Ongoing	**N/A**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Project Manager and Mechanical Engineer for the development of a program for the mechanical, plumbing/piping and electrical infrastructure for a new 600,000 sf, 9-story inpatient hospital on the University of Arizona Medical Center campus. Construction Costs: N/A

[X] Check if project performed with current firm

5.

(1) TITLE AND LOCATION *(City and State)*
US Department of Veterans Affairs – Southern Arizona VA Health Care System (SAVAHCS) – Tucson, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2014-Ongoing	**Est. 6/2015**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Project Manager and Mechanical Engineer responsible for mechanical, electrical and piping/plumbing design for the replacement of air handlers and a feasibility analysis for energy recovery on buildings 3 and 4 of the Southern Arizona VA Health Care System campus. Scope includes new direct digital controls (DDC), fire alarm upgrades, and variable frequency drives, as well as providing sprinkler protection within the building 4 mechanical room. This project is the first task order for a 5-year IDIQ contract with the VA's Southwest Health Care Network, Veterans Integrated Service Network (VISN) 18. Construction Costs: N/A

[X] Check if project performed with current firm

4. Resumes of Key Personnel Proposed for this Contract (*Complete one Section 4 for each key person.*

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
William Fiocchi	**Project Manager/Mechanical Engineer**	1. TOTAL **9**	2. WITH CURRENT FIRM **1**

d. LOCATION *(City and State)* **Phoenix, AZ**

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. PROFESSIONAL TRAINING - REGISTRATIONS
Bachelor of Science, Mechanical Engineering Bradley University	**Registered Professional Engineer Arizona – 57166**

g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)*
American Society for Healthcare Engineering (ASHE), Member – American Society of Heating and Refrigeration Engineers (ASHRAE)

H. RELEVANT PROJECTS

	(1) TITLE AND LOCATION *(City and State)*	(2) YEAR COMPLETED	
		Professional Services	Construction (if applicable)
1.	**Dignity Health/St. Joseph's Hospital & Medical Center – Linear Accelerator Replacement – Phoenix, Arizona**	**2013**	**6/2014**
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE Project Manager and Mechanical Engineer for MEP design services of 3,800 sf of removal and replacement of two existing Varian linear accelerators and a full renovation of the existing linear accelerator vaults. Including the addition of process cooling, supply and exhaust, branch piping and ductwork extension, normal and essential power electrical distribution systems, and domestic hot and cold water. Construction Costs: N/A	X Check if project performed with current firm	
2.	(1) TITLE AND LOCATION *(City and State)* **SurgCenter Development – Cornerstone Commons Specialty Surgery Center – Kenosha, Wisconsin**	(2) YEAR COMPLETED Professional Services **2013**	Construction (if applicable) **10/2014**
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE Project Manager and Mechanical Engineer for the electrical and piping/plumbing design for a 6,500 sf ambulatory care surgery center. Systems include a new transformer, 1000A electrical service, emergency generator, ATS, water heaters, water softener, reverse osmosis water system, deionized water system, fire protection, fire alarm and nurse call systems. Construction Costs: $1.5M	X Check if project performed with current firm	
3.	(1) TITLE AND LOCATION *(City and State)* **The University of Arizona – Bioscience Partnership Building – Phoenix, Arizona**	(2) YEAR COMPLETED Professional Services **2014-Ongoing**	Construction (if applicable) **Est. 10/2016**
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE Mechanical Engineer for the new 10-story 245,000 sf Biosciences Partnership Building (BPB). AEI's scope of services are to providemechanical systems designed for staff safety, reliability, ease of maintenance and energy efficiency. DOAS air handlers are located on each floor and will provide primary air to chilled beams. Exhaust air will pass through an energy recovery system before discharging at the roof. Multiple engine/generators will support the research functions taking place in the building. Construction Costs: $99M (Est.)	X Check if project performed with current firm	
4.	(1) TITLE AND LOCATION *(City and State)* **Mayo Clinic Arizona – Medallion Phase 3 Renovation – Phoenix, Arizona**	(2) YEAR COMPLETED Professional Services **2014**	Construction (if applicable) **Est. 11/2014**
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE Project Manager and Mechanical Engineer for modifications to the existing mechanical, electrical and piping/plumbing systems to accommodate wall removal, new room layouts, requirements, loads and re-lighting, as well as existing ceiling replacement and sight lighting design for a 16-car parking garage. Construction Costs: $1M	X Check if project performed with current firm	
5.	(1) TITLE AND LOCATION *(City and State)* **Mayo Clinic Arizona – Histology Lab Renovation Phase 1 – Scottsdale, Arizona**	(2) YEAR COMPLETED Professional Services **2014**	Construction (if applicable) **Est. 12/2014**
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE Project Manager and Mechanical Engineer of a multi-phase 1,600 sf histology laboratory renovation. Phase 1 renovation includes three rooms and incorporates switching grossing station functions with fume hood and ventilated tissue cabinet, relocation of sink to expanded functions at the grossing station. The relocated equipment includes but is not limited to fume hoods, ventilated tissue storage cabinets, ventilated flammable storage cabinets, specimen processing equipment, sinks and drains. Project will include a mechanical, electrical and plumbing existing system evaluation and development of construction documents to determine capabilities/capacities of the existing system and provide suitable system upgrades and modifications to meet the requirements of the department. Construction Costs: N/A	X Check if project performed with current firm	

4. Resumes of Key Personnel Proposed for this Contract (*Complete one Section 4 for each key person.)*

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
Nevin Heitner	**Mechanical Engineer/Commissioning Agent**	1. TOTAL **24**	2. WITH CURRENT FIRM **2**

d. LOCATION *(City and State)* **Phoenix, AZ**

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. PROFESSIONAL TRAINING - REGISTRATIONS
Bachelor of Science, Mechanical Engineering Lehigh University	**Registered Professional Engineer Arizona – 54572** LEED® Accredited Professional

g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)* Certified Building Commissioning Professional (CBCP), Certified Energy Manager (CEM), Association of Energy Engineers (AEE)

H. RELEVANT PROJECTS

1.

(1) TITLE AND LOCATION *(City and State)*: **City of Phoenix – Phoenix Sky Harbor International Airport Terminal 3 Modernization – Phoenix, Arizona**

(2) YEAR COMPLETED — Professional Services: **2013-Ongoing**; Construction (if applicable): **2/2018**

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

Mechanical Designer for the MEP design for the complete renovation of the 210,000 sf Terminal 3 at Phoenix Sky Harbor International Airport, as well as establishing overall electrical direction and electrical service design for expanded security checkpoints and a replacement South Concourse. Construction Costs: $540M (Est.)

[X] Check if project performed with current firm

2.

(1) TITLE AND LOCATION *(City and State)*: **Banner Thunderbird Medical Center –OR Renovations and Mechanical Upgrades – Glendale, Arizona**

(2) YEAR COMPLETED — Professional Services: **2014-Ongoing**; Construction (if applicable): **Est. 5/2015**

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

Mechanical Engineer for the OR modernization, which included complete demolition of the OR mechanical duct along with electrical infrastructure upgrades and architectural improvements. The air handler (AH-6) will be renovated by replacing the existing dual duct system with a new single duct system. The air handler will be added to the existing campus surgery chiller in a booster configuration. New master humidifiers will be added. The isolation panels in OR 1-6 and 11-15 will be replaced with new standard panelboards. All existing light fixtures within the corridor and operating rooms will be replaced with new high efficient LED light fixtures. Construction Costs: N/A

[X] Check if project performed with current firm

3.

(1) TITLE AND LOCATION *(City and State)*: **Recreation Centers of Sun City West – Johnson Recreation Center Study – Sun City West, Arizona**

(2) YEAR COMPLETED — Professional Services: **2012**; Construction (if applicable): **2013**

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

Project Manager and Mechanical Engineer for a 201,000 sf building renewable energy feasibility study. An energy audit was performed to identify existing equipment and develop renewable energy provisions through site survey, energy modeling, cost estimation, life cycle cost analyses, and conceptual design. Sustainable renewable energy options included solar photovoltaics, solar thermal hot water, and others. . Construction Costs: N/A

[X] Check if project performed with current firm

4.

(1) TITLE AND LOCATION *(City and State)*: **Arizona State University – Tempe Student Recreation Center Commissioning – Tempe, Arizona**

(2) YEAR COMPLETED — Professional Services: **2013**; Construction (if applicable): **6/2014**

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

Commissioning Agent responsible for preparing the master report and LEED construction phase documentation for the 84,500 sf Center. Necessary correction of test discrepancies were tracked and returned to the site to review building operations and conditions, with a specific focus on HVAC, plumbing and lighting control systems. Construction Costs: $23.2M

[X] Check if project performed with current firm

5.

(1) TITLE AND LOCATION *(City and State)*: **Banner Boswell Medical Center – Emergency Power Switchgear Expansion – Sun City, Arizona**

(2) YEAR COMPLETED — Professional Services: **2012**; Construction (if applicable): **11/2013**

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

Mechanical Engineer for the campus essential electric system expansion, which included the addition of a new 2.0 MW engine/generator set, a new 6,000A synchronizing switchgear with N+1 redundancy and connecting additional chillers to the equipment system to allow for full critical cooling on backup power. Construction Costs: $1.2M

[X] Check if project performed with current firm

4. Resumes of Key Personnel Proposed for this Contract (*Complete one Section 4 for each key person.)*

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
Charlie McGowan	**Mechanical Engineer**	1. TOTAL **4**	2. WITH CURRENT FIRM **4**

d. LOCATION *(City and State)* **Phoenix, AZ**

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. PROFESSIONAL TRAINING - REGISTRATIONS
Bachelor of Science, Architectural Engineering, Milwaukee School of Engineering	**Arizona – (License # Pending)**

g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)* American Society of Heating and Refrigeration Engineers (ASHRAE)

H. RELEVANT PROJECTS

1.

(1) TITLE AND LOCATION *(City and State)*: **City of Phoenix – Phoenix Sky Harbor International Airport Terminal 3 Modernization – Phoenix, Arizona**

(2) YEAR COMPLETED — Professional Services: **2013-Ongoing**; Construction (if applicable): **2/2018**

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

Mechanical Designer for the MEP design for the complete renovation of the 210,000 sf Terminal 3 at Phoenix Sky Harbor International Airport, as well as establishing overall electrical direction and electrical service design for expanded security checkpoints and a replacement South Concourse. Construction Costs: $540M (Est.)

[X] Check if project performed with current firm

2.

(1) TITLE AND LOCATION *(City and State)*: **Arizona State University – Vivarium HVAC/Chilled Water Reliability Study – Tempe, Arizona**

(2) YEAR COMPLETED — Professional Services: **2012**; Construction (if applicable): **N/A**

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

Mechanical Designer for a reliability assessment of the HVAC and chilled water systems serving the critical animal facilities on campus. The project also including as-built drawings of the campus central plant chilled water system and hydraulic model of the campus chilled water distribution system. Study Costs: $182,925

[X] Check if project performed with current firm

3.

(1) TITLE AND LOCATION *(City and State)*: **Banner Thunderbird Medical Center –OR Renovations and Mechanical Upgrades – Glendale, Arizona**

(2) YEAR COMPLETED — Professional Services: **2014-Ongoing**; Construction (if applicable): **Est. 5/2015**

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

Mechanical Designer for the OR modernization, which included complete demolition of the OR mechanical duct along with electrical infrastructure upgrades and architectural improvements. The air handler (AH-6) will be renovated by replacing the existing dual duct system with a new single duct system. The air handler will be added to the existing campus surgery chiller in a booster configuration. New master humidifiers will be added. The isolation panels in OR 1-6 and 11-15 will be replaced with new standard panelboards. All existing light fixtures within the corridor and operating rooms will be replaced with new high efficient LED light fixtures. Construction Costs: N/A

[X] Check if project performed with current firm

4.

(1) TITLE AND LOCATION *(City and State)*: **Banner Health – University of Arizona Health Network Master Plan – Tucson, Arizona**

(2) YEAR COMPLETED — Professional Services: **2014-Ongoing**; Construction (if applicable): **N/A**

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

Project Manager and Mechanical Engineer for the development of a program for the mechanical, plumbing/piping and electrical infrastructure for a new 600,000 sf, 9-story inpatient hospital on the University of Arizona Medical Center campus. Construction Costs: N/A

[X] Check if project performed with current firm

5.

(1) TITLE AND LOCATION *(City and State)*: **University of Arizona Health Network – University of Arizona Medical Center Data Center Upgrades – Tucson, Arizona**

(2) YEAR COMPLETED — Professional Services: **2013**; Construction (if applicable): **3/2014**

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

Mechanical Designer for renovation to add cooling and electrical infrastructure for N+1 redundancy, supporting electronic patient medical records. Project includes computational fluid dynamic CFD modeling of the existing conditions and various options to improve airflow and reconfigure to hot aisle/cold aisle alignment. Construction Costs: $600,000

[X] Check if project performed with current firm

4. Resumes of Key Personnel Proposed for this Contract (*Complete one Section 4 for each key person.)*

b. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
Gary Chiurazzi	**Piping/Plumbing Designer**	1. TOTAL **27**	2. WITH CURRENT FIRM **1**

d. LOCATION *(City and State)* **Phoenix, AZ**

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. PROFESSIONAL TRAINING - REGISTRATIONS: Certified Plumbing Designer (CPD), Certified in Plumbing Engineering (CIPE)

g. OTHER PROFESSIONAL QUALIFICATIONS *(Organizations, Awards, etc.)*

H. RELEVANT PROJECTS

1.

(1) TITLE AND LOCATION *(City and State)*
City of Phoenix – Phoenix Sky Harbor International Airport Terminal 3 Modernization – Phoenix, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2013-Ongoing	**Est. 2/2018**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Sr. Piping/plumbing Designer for the MEP design for the complete renovation of the 210,000 sf Terminal 3 at Phoenix Sky Harbor International Airport, as well as establishing overall electrical direction and electrical service design for expanded security checkpoints and a replacement South Concourse. Construction Costs: $540M (Est.)

[X] Check if project performed with current firm

2.

(1) TITLE AND LOCATION *(City and State)*
City of Phoenix – Public Works Facilities Natural Gas Generators – Phoenix, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2013-Ongoing	**Est. 10/2015**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Piping/plumbing Designer for piping/plumbing and electrical engineering design for new natural gas engine-generators for five City of Phoenix Public Works Department facilities throughout the city. Based upon review of existing site conditions, demands and capacities, the project team selected an appropriately-sized natural gas fueled engine/generator to support identified building and site functions. New automatic transfer switches were also provided at each facility to transfer power from the electric utility to the new engine/generator in the event utility service is lost. Provisions were also made for the connection of portable load banks for periodic generator load testing. Construction Costs: N/A

[X] Check if project performed with current firm

3.

(1) TITLE AND LOCATION *(City and State)*
City of Phoenix – Union Hills and 22nd Avenue Lightning and Surge Protection – Phoenix, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2014-Ongoing	**Est. 5/2015**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Project Manager for review to perform a field survey and risk assessment for lightning or surge protection systems at the 22nd Avenue Service Center (Facilities Management) and Union Hills Service Center Buildings. Recommendations were presented for associated electrical surge and lightning protection and NFPA 780 lightning protection. Construction Costs: N/A

[X] Check if project performed with current firm

4.

(1) TITLE AND LOCATION *(City and State)*
Dignity Health/St. Joseph's Hospital & Medical Center – Linear Accelerator Replacement – Phoenix, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2013	**6/2014**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Piping/plumbing oversight for MEP design services of 3,800 sf of removal and replacement of two existing Varian linear accelerators and a full renovation of the existing linear accelerator vaults. Including the addition of process cooling, supply and exhaust, branch piping and ductwork extension, normal and essential power electrical distribution systems, and domestic hot and cold water. Construction Costs: N/A

[X] Check if project performed with current firm

5.

(1) TITLE AND LOCATION *(City and State)*
SurgCenter Development – Surgery Center of Tucson – Tucson, Arizona

(2) YEAR COMPLETED

Professional Services	Construction (if applicable)
2013	**7/2014**

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Piping/plumbing oversight for the electrical and piping/plumbing design for a 6,500 sf ambulatory care surgery center. Systems include a new transformer, 1000A electrical service, emergency generator, ATS, water heaters, water softener, reverse osmosis water system, deionized water system, fire protection, fire alarm and nurse call systems. Construction Costs: $1.5M

[X] Check if project performed with current firm

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	
City of Phoenix – Phoenix Sky Harbor International Airport Terminal 3 Modernization – Phoenix, Arizona	PROFESSIONAL SERVICES **Mechanical/Electrical/ Plumbing**	CONSTRUCTION *(If applicable* **Est. 2/2018**

23. PROJECT OWNER'S INFORMATION

c .PROJECT OWNER	d .ORIGINAL BUDGET/NTE AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
City of Phoenix	**Est. $540M**	**N/A**

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

Terminal 3 Modernization

The Modernization project consists of the Terminal (Central Processor), North Concourse and South Concourse. AEI's focus is the Central Processor MEP design and the Electrical distribution for the entire Terminal, including emergency power and central 400Hz power.

As part of the renovation all mechanical equipment is planned to be replaced. The mechanical design was challenged with a high traffic ground level, multiple atria, and aggressive energy goals all while keeping the building operational during construction. The central processor contains ticketing, baggage claim, and the security checkpoint for all of Terminal 3. Multiple roof mounted air handlers equipped with energy wheel energy recovery serve the central processor of Terminal 3. Mechanical system are being designed to accommodate the high swings in occupancy typically observed in a major airport terminal. Through coordination with the architecture design team, the passenger level contains zero visible ductwork for a wide open feel to the passenger.

A new main service entrance electrical room will be provided as part of the Terminal 3 modernization. The Airport will remain in operation during the main service switchover. Meticulous coordination efforts are required to minimize disruption and provide the required work in the appropriate phases. At the end of the project, the Terminal will have (12) 3000A 480Y/277V APS services, a new central plant, new central 400Hz power and a complete face-lift.

Terminal 3 Electrical Upgrades

The Terminal 3 Electrical Upgrade project is a thorough electrical infrastructure upgrade intended to serve the needs of Terminal 3 for decades to come. The project team's first task was to walk the terminal and document the entire electrical distribution system, both normal and emergency power. Future load growth was then analyzed and recommended upgrades were prepared and presented. Ultimately, the design included the replacement and consolidation of eleven utility electrical services. Review of existing loads allowed consolidation of several services, 'freeing up' utility transformers to allow for double-ended service entrances thereby improving reliability. The new design took into account the 24/7 nature of the terminal and phasing was coordinated with the CMAR. AEI has been hired to review the Design Development Documents and final Permit/ Construction Documents and to advise the Aviation Project Manager, Project Manager and Lead Electrical Engineer. AEI has also been contracted to perform Construction Administration services for mechanical and plumbing systems.

Terminal 3 Parking Garage Lighting Study and Upgrades

Brought on board to improve the lighting in the Terminal 3 parking structure, AEI's initial efforts began with an evaluation of lamp technology, including metal halide, fluorescent, induction and LED. Based on the results of a detailed life cycle cost analysis, our team selected LED as the best option and the solution was implemented. The final design met Illuminating Engineering Society (IES) recommendations for both illumination and controllability.

Subsequent to this study, AEI's project scope included renovating the lighting within the elevator lobbies and stairwells, utilizing both LED and linear fluorescent type luminaries, and installing a separate electrical service and distribution system (to allow for the APS e67 billing rate held exclusively for City of Phoenix-owned lighting loads). Following the development of the lighting recommendations report, AEI developed prequalification specifications and provided a preliminary review of all submittals from lighting manufacturers and their associated representatives. These specifications assisted in determining if the lighting met IES recommended minimum foot-candle levels, average foot-candle levels and maximum/minimum ratios as indicated in the specifications.

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 – Vivarium HVAC/Chilled Water Reliability Study – Tempe, Arizona	PROFESSIONAL SERVICES **Reliability Analyses and Cost Estimation**	CONSTRUCTION *(If applicable* **2012**

23. PROJECT OWNER'S INFORMATION

c .PROJECT OWNER	d .ORIGINAL BUDGET/NTE AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
Arizona State University	**$178,000**	**Study Cost $182,925**

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

Affiliated Engineers was engaged to develop facility and utility infrastructure reliability analyses and cost estimation services for HVAC and chilled water systems upgrades for critical animal facilities on the Tempe campus. The main objective was to determine whether or not the existing HVAC systems could provide a 10-minute maximum downtime for airflow loss and 50-minute loss of cooling, in the event of an equipment failure or loss of campus normal electrical power.

Our team also studied and modeled the campus chilled water infrastructure, including the central plant, combined heat and power plant, and campus chilled water piping network. The 3-D as-built models of the campus central plant chilled water system and the hydraulic models of the campus chilled water distribution system calculated the minimum number of chillers, pumps, and cooling towers that were necessary to support the cooling loads withcin the animal facilities, and determined how the chilled water could be supplied during a loss of campus normal power.

Based upon this survey, AEI determined that the Central Heating Plan's (CHP) equipment was inadequate to provide the required chilled water to all of ASU's campus. A list of recommended upgrades for each facility was developed with budget costs for each project. Finally, AEI recommended developing a full as-built document set to enable future renovations or upgrades within the facility.

AEI also recommended a reliability study for all additional research buildings and data centers on campus, to determine the total chilled water capacity required to be connected to emergency power infrastructure.

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*
Banner Thunderbird Medical Center – OR Renovation and Mechanical Upgrades – Glendale, Arizona	**Electrical/Mechanical/ Plumbing**	**Est. 5/2015**

23. PROJECT OWNER'S INFORMATION

c .PROJECT OWNER	d .ORIGINAL BUDGET/NTE AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
Banner Health	**N/A**	**N/A**

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

AEI is providing mechanical, electrical, and plumbing engineering services for the OR Modernization, which included complete demolition of the OR mechanical duct along with electrical infrastructure upgrades and architectural improvements. The air handler (AH-6) modernization which serves 6 OR's, 2 C- Section Rooms, Sterile Core, and Labor and Delivery, will be renovated by replacing the existing dual duct system with a new single duct system, while maintaining operation and occupancy of the OR Suite. The project team designed a single duct system that would allow construction to be complete for half of the OR's while maintaining the air flow in the activate OR Suite in the adjacent space. The air handler will be added to the existing campus surgery chiller in a booster configuration. In lieu of existing local humidifiers in the OR suite ceiling, new master humidifiers will be provided at the air handler resulting in lower static pressure in the duct and minimize noise. The isolation panels in OR 1-6 and 11-15 will be replaced with new standard panelboards which were approved per Banner Health's OR Wet Location Assessment. All existing light fixtures within the corridor and operating rooms will be replaced with new high efficient LED light fixtures providing adequate illumination levels throughout the suite.

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 Phoenix – Public Works Facilities Natural Gas Generators – Phoenix, Arizona	**Electrical/Plumbing**	**Est. 10/2015**

23. PROJECT OWNER'S INFORMATION

c .PROJECT OWNER	d .ORIGINAL BUDGET/NTE AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
City of Phoenix	**Est. $1.5M**	**N/A**

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

AEI is providing piping/plumbing engineering design and electrical engineering design for new Natural gas engine-generators for five (5) City of Phoenix Public Works Department (PWD) facilities throughout the city.

The project includes reviewing the following existing conditions:

- Electrical demand and natural gas loads at each facility
- Electrical service and distribution
- Natural gas supply capacities at each location, and
- Site opportunities and limitations.

From these reviews, AEI will select an appropriately-sized natural gas (NG) fueled engine/generator(s) to support identified building and site functions. The engine/generators will be located on new concrete pad(s) in the vicinity of the electrical service or at another location as directed by the City PWD. New automatic transfer switches will be provided at each facility location to transfer power from the serving electric utility to the new engine/generator in the event utility service is lost. Provisions will be made for connection of portable load banks for periodic generator load testing.

In April 2011, each facility underwent a needs assessment that identified critical operations to be backed up by the engine/generator, electrical load (kW) to be supported by the engine/generator, and required run-time duration. At least one location will require a new electrical service entrance section (SES) in conjunction with the new stand-by generator.

The five (5) locations where new NG engine/generators will be provided are at five (5) Public Works Facilities.

Union Hills

Glenrosa Service Center

Salt River Service Center

South Shops

Okemah Service Center

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*
University of Arizona Health Network – University of Arizona Medical Center Data Center Upgrades – Tucson, Arizona	**Facility Assessment, Mechanical/Electrical Design and Commissioning Services**	**3/2014**

23. PROJECT OWNER'S INFORMATION

c .PROJECT OWNER	d .ORIGINAL BUDGET/NTE AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
City of Phoenix	**$590,000**	**$600,000** (added commissioning services)

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

AEI provided a facility assessment, mechanical, electrical design and commissioning services for the renovation of the University of Arizona Health Network's campus data center. Project scope included design of a new Uninterrupted Power Supply (UPS), new Computer Room Air Conditioning Units (CRACs), FM-200 Fire Protection, and a Computational Fluid Dynamics (CFD) model to support the Electronic Privacy Information Center (EPIC). To accommodate equipment needs, 5 new 25kW server racks were added to the existing equipment, which was reorganized to optimize cooling efficiency. Parallel to the design process, AEI performed a study of the existing 1,700 sf data center configurations using CFD to track temperature fluctuations. Our team modeled several N+1 configurations to provide cost-effective and energy-efficient options to the University. The data center is located in a basement room, directly beneath patient rooms and across from a busy laundry room facility. With such extensive existing mechanical and electrical infrastructure in the vicinity, our team performed a full inventory of existing site equipment to determine the facility's true load capacity. By adding some additional breakers to support a weakened 600-amp feeding panel, we were able to easily accommodate the increased mechanical equipment capacity. AEI also commissioned all of the new equipment to test optimal functionality.

6. ADDITIONAL INFORMATION

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

AFFILIATED ENGINEERS

Affiliated Engineers (AEI) is a technical consulting, design, and engineering firm, specializing in complex and highly technical projects. With a history going back 80 years, AEI is owned by 25 principals who develop and maintain client relationships and provide project leadership.

A nationwide firm with approximately 576 employees, we have 12 regional offices, including the Phoenix office, which is comprised of more than 30 professional staff. More than eighty percent of our projects are with repeat clients, demonstrating our ability to provide high-quality service and deliver accurate work, on time and within budget. The following pages highlight the experience of our carefully selected technical staff who will work together to provide the client with the most optimal solutions for each assignment. Our team will contribute to your goals by bringing the following competencies:

Team Integration and Close Coordination:

AEI is a multi-disciplined engineering firm providing a wide and complementary array of engineering design services all out of one office, providing you with a team that is accustomed to working together on complex projects that require clear communication and coordination, contributing to a seamless design process.

Specialized Experience:

Adaptive Re-use. The unique programming needs that go along with renovating building systems for adaptive re-use stretches the imagination of those designing these spaces. AEI's designers understand the challenges associated with renovating a building with a past life into a building with a new life. In fact, the vast majority of our projects include building renovations for users/constituents with varied priorities, backgrounds, and functions. As building designers, we must work with each user group to create a space that is fully functional, yet versatile. Our design takes into account that spaces often serve different users during different times of the day or different periods of the year. We also know that the use of the space, as envisioned today, is likely to be vastly different in just a few short years. As a result, buildings systems must be designed with an appropriate level of flexibility and adaptability—an expertise AEI will bring to maximize the potential of re-use projects.

Utility Infrastructure. In addition to mechanical, electrical, plumbing/piping and sustainable building design, AEI also plans, designs, and implements utility system solutions. The client will benefit from our utility infrastructure practice because we're focused on long-term planning and life cycle cost analysis to ensure flexibility to meet future growth and load requirements, while functioning with optimum efficiency and reliability at current demand levels.

Primary Areas of Expertise:

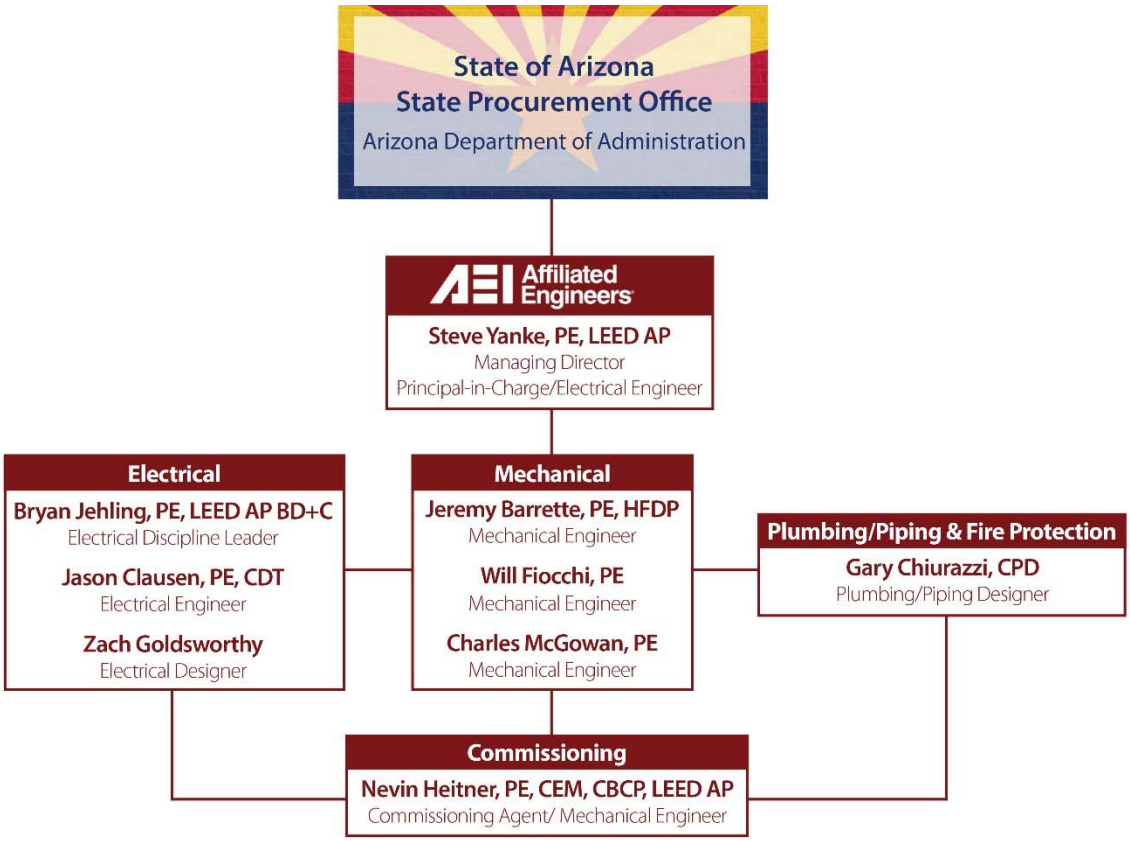
- Utility Master Planning, phasing implementation, realizing cost and energy savings, and guiding fiscal planning
- Electrical Power Distribution
- Gas and solid fuel Central Heating Plants
- Chilled Water Systems
- Commissioning, utilizing detailed functional performance testing protocols, system redundancy testing, and rigorous training programs
- Building Systems Design

Additional areas of expertise include Combined Heat and Power, Thermal Storage, Alternative Fuel Types and Sources, Telecommunications and Data, Network Modeling of Steam and Hydronic Systems and Building Management/Control Systems.

Schedule-challenged Projects. The projects that we have included in our response demonstrate our ability to design, manage, and plan for complex projects within 24/7, public facilities with high security requirements that can impact schedule-driven projects. Drawing from our significant experience we have developed an approach that addresses similar challenges that a client may encounter in order to meet schedule goals.

AEI Affiliated Engineers

TEAM ORGANIZATION CHART



PROJECT TEAM

AEI | Affiliated Engineers, Inc.

Steven J. Yanke, PE, LEED AP

Principal/Managing Director/Electrical Engineer

Steve leads AEI's Phoenix office. He is a registered engineer with over 27 years of demonstrated success in positions of increasing responsibility in electrical engineering design, project management, marketing and business operations. He brings his clients strong project design and construction experience in government, higher education and healthcare, corporate and institutional facilities.

EDUCATION

Bachelor of Science, Electrical Engineering, Milwaukee School of Engineering

CERTIFICATIONS

Registered Professional Engineer - Arizona # 33014
LEED Accredited Professional

YEARS WITH FIRM

7 years

Bryan J. Jehling, PE, LEED AP BD+C

Electrical Discipline Leader/Project Managing/Electrical Engineer

Bryan is the Electrical Department Lead for Affiliated Engineers' Phoenix office. Bryan has 25 years of experience in the electrical engineering field serving the architectural, engineering, and construction industry in various market sectors including laboratories, data centers, higher education, general office, healthcare, and correctional. Bryan's specialties include the development of electrical distribution systems and participation in the design of low voltage structured cabling distribution. He is also becoming heavily involved in the design and implementation of sustainable energy reduction strategies, as well as renewable energy solutions such as solar, for renovated and new facilities.

EDUCATION

Bachelor of Science, Electrical Engineering, Northern Illinois University

CERTIFICATIONS

Registered Professional Engineer - Arizona # 32857
LEED Accredited Professional

YEARS WITH FIRM

Joined AEI October 2014

Jeremy Barrette, PE, HFDP

Project Manager/Mechanical Engineer

Jeremy has more than 17 years of mechanical engineering, product development, and project management experience, specifically focusing on mechanical products and control systems design for higher education, laboratory, industrial and healthcare clients. His responsibilities at AEI include project management and mechanical systems design from concept development and systems evaluation through construction document completion and construction phase project support.

EDUCATION

Master of Science, Management of Marketing and Technology Innovation, Worcester Polytechnic Institute
Bachelor of Science, Mechanical Engineering, Oral Roberts University

CERTIFICATIONS

Registered Professional Engineer - Arizona # 52320
ASHRAE Health Facility Design Professional - 8241101

YEARS WITH FIRM

4 years

William T. Fiocchi, PE

Project Manager/Mechanical Engineer

Will has a proven track record in a variety of challenging healthcare and commercial projects. For over 9 years, he has applied his project management skills in the design of healthcare, education and government buildings, and has been a strong resource in applying communication skills to his long-standing client relationships. He has been involved in all phases of facilities projects, including conceptual design, construction cost estimates, construction document development, scheduling, and construction supervision.

EDUCATION

Bachelor of Science, Mechanical Engineering, Bradley University
Registered Professional Engineer - Arizona # 57166

YEARS WITH FIRM

1.5

Gary Chiurazzi, CPD

Project Manager/Piping/Plumbing Designer and Oversight

Gary has over 27 years of experience in plumbing, medical gas, and fire protection system design in the healthcare, municipal, science and technology, institutional, and commercial market sectors. Gary is responsible for project management, quality control and review. He is also the local representative for the company's water conservation initiative, a formal program focused on assisting project owners rethink and reduce overall water usage on a project-by-project basis.

CERTIFICATIONS

Certified in Plumbing Engineering (CIPE)
Certified Plumbing Designer (CPD)
National Inspection Testing Certification (NITC)
Certified ASSE 6020 Medical Gas Inspector

YEARS WITH FIRM

1

Nevin Heitner, PE, CBCP, CEM ,LEED AP

Commissioning Agent/Mechanical Engineer

Nevin is experienced in leading teams in mechanical system planning and design for new construction and renovation projects, specifically involving higher education, healthcare, industrial and hospitality facilities. Nevin has over 23 years of extensive background in commissioning HVAC systems and state-of-the-art building automation systems for critical facilities, including preparing master reports and LEED documentation for project acceptance, and tracking correction of test discrepancies, with a specific focus on HVAC, plumbing and lighting control systems.

EDUCATION

Bachelor of Science, Mechanical Engineering, Lehigh University

CERTIFICATION

Registered Professional Engineer - Arizona # 54572
Certified Building Commissioning Professional (CBCP)
Certified Energy Manager (CEM)
LEED Accredited Professional

YEARS WITH FIRM

2

Zach Goldsworthy

Electrical Designer

Zach understands the need for continuity of power not only after the project is complete, but also during construction. His over 8 years of experience include numerous renovation and new construction projects for various clients, including the City of Phoenix, University of Arizona, Banner Health and Dignity Health. As such, he is very familiar with an extensive array of design standards and requirements. He specializes in power system modeling (load flow, short circuit, breaker coordination, and harmonic analysis) using SKM software.

EDUCATION

Bachelor of Science, Electrical Engineering, Milwaukee School of Engineering

YEARS WITH FIRM

5

Jason C. Clausen, PE, CDT

Electrical Engineer

Jason has over 11 years of experience in electrical engineering design, document production, quality control and specifications for new and renovated facilities. He has both designed and supervised the design of many types of building electrical systems, including medium and low-voltage power distribution, emergency power systems, lighting, lighting controls, telecommunication and life-safety notification systems. He has significant experience in many diverse building types, including government, industrial, higher education, and healthcare facilities.

EDUCATION

Bachelor of Science, Electrical Engineering, South Dakota University

CERTIFICATIONS

Registered Professional Engineer - Arizona # 52023

YEARS WITH FIRM

2

Charles McGowan, PE

Mechanical Engineer

As a mechanical engineer, Charlie works closely with clients in the production and coordination of ductwork, and in piping plan layouts. He also diagrams the process and instrumentation of heating and cooling systems for a variety of building types. Charlie provides analysis and design of the systems including load calculations, equipment/material selection, layout, sizing, control and other design considerations. Charlie has surveyed project sites, served as the liaison for the mechanical teams, and coordinated mechanical requirements with architectural and structural designs.

EDUCATION

Bachelor of Science, Architectural Engineering, Milwaukee School of Engineering
Registered Professional Engineer - Arizona # pending

YEARS WITH FIRM

4

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:	30%
b.	Percentage of Total Work Attributable to Non-Government Work:	70%

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

Signature: _____ Date: 12/22/2014

Name: Steven J. Yanke Title: Principal/Managing Director