

# PROFESSIONAL CONSULTANT SERVICES AGREEMENT

ORSA CONSULTING ENGINEERS, INC.

[WQCP – ARC Flash Study Project, RFP No. 1860]

THIS PROFESSIONAL CONSULTANT SERVICES AGREEMENT (“Agreement”) is made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 2019 (“Effective Date”), by and between the CITY OF RIVERSIDE, a California charter city and municipal corporation (“City”), and ORSA CONSULTING ENGINEERS, INC, a California corporation (“Consultant”).

1. **Scope of Services.** City agrees to retain and does hereby retain Consultant and Consultant agrees to provide the services more particularly described in Exhibit “A,” “Scope of Services” (“Services”), attached hereto and incorporated herein by reference, in conjunction with WQCP – ARC Flash Study Project, RFP No. 1860 (“Project”).

2. **Term.** This Agreement shall be effective on the date first written above and shall remain in effect for 1 year from effective date, unless otherwise terminated pursuant to the provisions herein.

3. **Compensation/Payment.** Consultant shall perform the Services under this Agreement for the total sum not to exceed One Hundred Nine Thousand Eight Hundred Fifty Dollars (\$109,850) payable in accordance with the terms set forth in Exhibit “B.” Said payment shall be made in accordance with City’s usual accounting procedures upon receipt and approval of an itemized invoice setting forth the services performed. The invoices shall be delivered to City at the address set forth in Section 4 hereof.

4. **Notices.** Any notices required to be given, hereunder shall be in writing and shall be personally served or given by mail. Any notice given by mail shall be deemed given when deposited in the United States Mail, certified and postage prepaid, addressed to the party to be served as follows:

To City

City of Riverside  
Public Works Director  
3900 Main Street  
Riverside, CA 92522

To Consultant

Orsa Consulting Engineers, Inc.  
Attn: Misha Davoodian  
223 E. Imperial Hwy., #130  
Fullerton, CA 92835

5. **Prevailing Wage.** If applicable, Consultant and all subcontractors are required to pay the general prevailing wage rates of per diem wages and overtime and holiday wages determined by the Director of the Department of Industrial Relations under Section 1720 et seq. of the California Labor Code and implemented by Resolution No. 13346 of the City Council of the City of Riverside. The Director's determination is available on-line at [www.dir.ca.gov/dlsr/DPreWageDetermination.htm](http://www.dir.ca.gov/dlsr/DPreWageDetermination.htm) and is referred to and made a part hereof; the wage rates therein ascertained, determined, and specified are referred to and made a part hereof as though fully set forth herein.

6. **Contract Administration.** A designee of the City will be appointed in writing by the City Manager or Department Director to administer this Agreement on behalf of City and shall be referred to herein as Contract Administrator.

7. **Standard of Performance.** While performing the Services, Consultant shall exercise the reasonable professional care and skill customarily exercised by reputable members of Consultant's profession practicing in the Metropolitan Southern California Area, and shall use reasonable diligence and best judgment while exercising its professional skill and expertise.

8. **Personnel.** Consultant shall furnish all personnel necessary to perform the Services and shall be responsible for their performance and compensation. Consultant recognizes that the qualifications and experience of the personnel to be used are vital to professional and timely completion of the Services. The key personnel listed in Exhibit "C" attached hereto and incorporated herein by this reference and assigned to perform portions of the Services shall remain assigned through completion of the Services, unless otherwise mutually agreed by the parties in writing, or caused by hardship or resignation in which case substitutes shall be subject to City approval.

9. **Assignment and Subcontracting.** Neither party shall assign any right, interest, or obligation in or under this Agreement to any other entity without prior written consent of the other party. In any event, no assignment shall be made unless the assignee expressly assumes the obligations of assignor under this Agreement, in a writing satisfactory to the parties. Consultant acknowledges that any assignment may, at the City's sole discretion, require City Manager and/or City Council approval. Consultant shall not subcontract any portion of the work required by this Agreement without prior written approval by the responsible City Contract Administrator. Subcontracts, if any, shall contain a provision making them subject to all provisions stipulated in this Agreement, including without limitation, the insurance obligations set forth in Section 12. The Consultant acknowledges and agrees that the City is an intended beneficiary of any work performed by any subcontractor for purposes of establishing a duty of care between any subcontractor and the City.

10. **Independent Contractor.** In the performance of this Agreement, Consultant, and Consultant's employees, subcontractors and agents, shall act in an independent capacity as independent contractors, and not as officers or employees of the City of Riverside. Consultant acknowledges and agrees that the City has no obligation to pay or withhold state or federal taxes or to provide workers' compensation or unemployment insurance to Consultant, or to Consultant's employees, subcontractors and agents. Consultant, as an independent contractor, shall be responsible for any and all taxes that apply to Consultant as an employer.

## **11. Indemnification.**

**11.1 Design Professional Defined.** For purposes of this Agreement, "Design Professional" includes the following:

- A. An individual licensed as an architect pursuant to Chapter 3 (commencing with Section 5500) of Division 3 of the Business and Professions Code, and a business entity offering architectural services in accordance with that chapter.
- B. An individual licensed as a landscape architect pursuant to Chapter 3.5 (commencing with Section 5615) of Division 3 of the Business and Professions Code, and a business entity offering landscape architectural services in accordance with that chapter.
- C. An individual registered as a professional engineer pursuant to Chapter 7 (commencing with Section 6700) of Division 3 of the Business and Professions Code, and a business entity offering professional engineering services in accordance with that chapter.
- D. An individual licensed as a professional land surveyor pursuant to Chapter 15 (commencing with Section 8700) of Division 3 of the Business and Professions Code, and a business entity offering professional land surveying services in accordance with that chapter.

**11.2 Defense Obligation For Design Professional Liability.** Consultant agrees, at its cost and expense, to promptly defend the City, and the City's employees, officers, managers, agents and council members (collectively the "Parties to be Defended") from and against any and all claims, allegations, lawsuits, arbitration proceedings, administrative proceedings, regulatory proceedings, or other legal proceedings to the extent the same arise out of, pertain to, or relate to the negligence, recklessness or willful misconduct of Consultant, or anyone employed by or working under the Consultant or for services rendered to the Consultant in the performance of the Agreement, notwithstanding that the City may have benefited from its work or services and whether or not caused in part by the negligence of an Indemnified Party. Consultant agrees to provide this defense immediately upon written notice from the City, and with well qualified, adequately insured and experienced legal counsel acceptable to City. Consultant will reimburse City for reasonable defense costs for claims arising out of Consultant's professional negligence based on the percentage of Consultant's liability. This obligation to defend as set forth herein is binding on the successors, assigns and heirs of Consultant and shall survive the termination of Consultant's Services under this Agreement.

**11.3 Indemnity For Design Professional Liability.** When the law establishes a professional standard of care for Consultant's services, to the fullest extent permitted by law, Consultant shall indemnify, protect and hold harmless the City and the City's employees, officers, managers, agents, and Council Members ("Indemnified Parties") from and against any and all claim for damage, charge, lawsuit, action, judicial, administrative, regulatory or arbitration proceeding,

damage, cost, expense (including counsel and expert fees), judgment, civil fines and penalties, liabilities or losses of any kind or nature whatsoever to the extent the same arise out of, pertain to, or relate to the negligence, recklessness or willful misconduct of Consultant, or anyone employed by or working under the Consultant or for services rendered to the Consultant in the performance of the Agreement, notwithstanding that the City may have benefited from its work or services and whether or not caused in part by the negligence of an Indemnified Party.

#### **11.4 Defense Obligation For Other Than Design Professional Liability.**

Consultant agrees, at its cost and expense, to promptly defend the City, and the City's employees, officers, managers, agents and council members (collectively the "Parties to be Defended") from and against any and all claims, allegations, lawsuits, arbitration proceedings, administrative proceedings, regulatory proceedings, or other legal proceedings which arise out of, or relate to, or are in any way connected with: 1) the Services, work, activities, operations, or duties of the Consultant, or of anyone employed by or working under the Consultant, or 2) any breach of the Agreement by the Consultant.

This duty to defend shall apply whether or not such claims, allegations, lawsuits or proceedings have merit or are meritless, or which involve claims or allegations that any or all of the Parties to be Defended were actively, passively, or concurrently negligent, or which otherwise assert that the Parties to be Defended are responsible, in whole or in part, for any loss, damage or injury. Consultant agrees to provide this defense immediately upon written notice from the City, and with well qualified, adequately insured and experienced legal counsel acceptable to City. This obligation to defend as set forth herein is binding on the successors, assigns and heirs of Consultant and shall survive the termination of Consultant's Services under this Agreement.

**11.5 Indemnity For Other Than Design Professional Liability.** Except as to the sole negligence or willful misconduct of the City, Consultant agrees to indemnify, protect and hold harmless the Indemnified Parties from and against any claim for damage, charge, lawsuit, action, judicial, administrative, regulatory or arbitration proceeding, damage, cost, expense (including counsel and expert fees), judgment, civil fine and penalties, liabilities or losses of any kind or nature whatsoever whether actual, threatened or alleged, which arise out of, pertain to, or relate to, or are a consequence of, or are attributable to, or are in any manner connected with the performance of the Services, work, activities, operations or duties of the Consultant, or anyone employed by or working under the Consultant or for services rendered to Consultant in the performance of this Agreement, notwithstanding that the City may have benefited from its work or services. This indemnification provision shall apply to any acts, omissions, negligence, recklessness, or willful misconduct, whether active or passive, on the part of the Consultant or anyone employed or working under the Consultant.

## **12. Insurance.**

**12.1 General Provisions.** Prior to the City's execution of this Agreement, Consultant shall provide satisfactory evidence of, and shall thereafter maintain during the term of this Agreement, such insurance policies and coverages in the types, limits, forms and ratings required herein. The rating and required insurance policies and coverages may be modified in writing by the City's Risk Manager or City Attorney, or a designee, unless such modification is prohibited by law.

**12.1.1 Limitations.** These minimum amounts of coverage shall not constitute any limitation or cap on Consultant's indemnification obligations under Section 11 hereof.

**12.1.2 Ratings.** Any insurance policy or coverage provided by Consultant or subcontractors as required by this Agreement shall be deemed inadequate and a material breach of this Agreement, unless such policy or coverage is issued by insurance companies authorized to transact insurance business in the State of California with a policy holder's rating of A or higher and a Financial Class of VII or higher.

**12.1.3 Cancellation.** The policies shall not be canceled unless thirty (30) days' prior written notification of intended cancellation has been given to City by certified or registered mail, postage prepaid.

**12.1.4 Adequacy.** The City, its officers, employees and agents make no representation that the types or limits of insurance specified to be carried by Consultant pursuant to this Agreement are adequate to protect Consultant. If Consultant believes that any required insurance coverage is inadequate, Consultant will obtain such additional insurance coverage as Consultant deems adequate, at Consultant's sole expense.

**12.2 Workers' Compensation Insurance.** By executing this Agreement, Consultant certifies that Consultant is aware of and will comply with Section 3700 of the Labor Code of the State of California requiring every employer to be insured against liability for workers' compensation, or to undertake self-insurance before commencing any of the work. Consultant shall carry the insurance or provide for self-insurance required by California law to protect said Consultant from claims under the Workers' Compensation Act. Prior to City's execution of this Agreement, Consultant shall file with City either 1) a certificate of insurance showing that such insurance is in effect, or that Consultant is self-insured for such coverage, or 2) a certified statement that Consultant has no employees, and acknowledging that if Consultant does employ any person, the necessary certificate of insurance will immediately be filed with City. Any certificate filed with City shall provide that City will be given ten (10) days' prior written notice before modification or cancellation thereof.

**12.3 Commercial General Liability and Automobile Insurance.** Prior to City's execution of this Agreement, Consultant shall obtain, and shall thereafter maintain during the term of this Agreement, commercial general liability insurance and automobile liability insurance as required to insure Consultant against damages for personal injury, including accidental death, as well as from claims for property damage, which may arise from or which may concern operations by anyone directly or indirectly employed by, connected with, or acting for or on behalf of Consultant. The City, and its officers, employees and agents, shall be named as additional insureds under the Consultant's insurance policies.

**12.3.1** Consultant's commercial general liability insurance policy shall cover both bodily injury (including death) and property damage (including, but not limited to, premises operations liability, products-completed operations liability, independent contractor's liability, personal injury liability, and contractual liability) in an amount not less than \$1,000,000 per occurrence and a general aggregate limit in the amount of not less than \$2,000,000.

12.3.2 Consultant's automobile liability policy shall cover both bodily injury and property damage in an amount not less than \$1,000,000 per occurrence and an aggregate limit of not less than \$1,000,000. All of Consultant's automobile and/or commercial general liability insurance policies shall cover all vehicles used in connection with Consultant's performance of this Agreement, which vehicles shall include, but are not limited to, Consultant owned vehicles, Consultant leased vehicles, Consultant's employee vehicles, non-Consultant owned vehicles and hired vehicles.

12.3.3 Prior to City's execution of this Agreement, copies of insurance policies or original certificates along with additional insured endorsements acceptable to the City evidencing the coverage required by this Agreement, for both commercial general and automobile liability insurance, shall be filed with City and shall include the City and its officers, employees and agents, as additional insureds. Said policies shall be in the usual form of commercial general and automobile liability insurance policies, but shall include the following provisions:

It is agreed that the City of Riverside, and its officers, employees and agents, are added as additional insureds under this policy, solely for work done by and on behalf of the named insured for the City of Riverside.

12.3.4 The insurance policy or policies shall also comply with the following provisions:

- a. The policy shall be endorsed to waive any right of subrogation against the City and its sub-consultants, employees, officers and agents for services performed under this Agreement.
- b. If the policy is written on a claims made basis, the certificate should so specify and the policy must continue in force for one year after completion of the services. The retroactive date of coverage must also be listed.
- c. The policy shall specify that the insurance provided by Consultant will be considered primary and not contributory to any other insurance available to the City and Endorsement No. CG 20010413 shall be provided to the City.

**12.4 Errors and Omissions Insurance.** Prior to City's execution of this Agreement, Consultant shall obtain, and shall thereafter maintain during the term of this Agreement, errors and omissions professional liability insurance in the minimum amount of \$1,000,000 to protect the City from claims resulting from the Consultant's activities.

**12.5 Subcontractors' Insurance.** Consultant shall require all of its subcontractors to carry insurance, in an amount sufficient to cover the risk of injury, damage or loss that may be caused by the subcontractors' scope of work and activities provided in furtherance of this Agreement, including, but without limitation, the following coverages: Workers Compensation, Commercial General Liability, Errors and Omissions, and Automobile liability. Upon City's request,

Consultant shall provide City with satisfactory evidence that Subcontractors have obtained insurance policies and coverages required by this section.

13. **Business Tax.** Consultant understands that the Services performed under this Agreement constitutes doing business in the City of Riverside, and Consultant agrees that Consultant will register for and pay a business tax pursuant to Chapter 5.04 of the Riverside Municipal Code and keep such tax certificate current during the term of this Agreement.

14. **Time of Essence.** Time is of the essence for each and every provision of this Agreement.

15. **City's Right to Employ Other Consultants.** City reserves the right to employ other Consultants in connection with the Project. If the City is required to employ another consultant to complete Consultant's work, due to the failure of the Consultant to perform, or due to the breach of any of the provisions of this Agreement, the City reserves the right to seek reimbursement from Consultant.

16. **Accounting Records.** Consultant shall maintain complete and accurate records with respect to costs incurred under this Agreement. All such records shall be clearly identifiable. Consultant shall allow a representative of City during normal business hours to examine, audit, and make transcripts or copies of such records and any other documents created pursuant to this Agreement. Consultant shall allow inspection of all work, data, documents, proceedings, and activities related to the Agreement for a period of three (3) years from the date of final payment under this Agreement.

17. **Confidentiality.** All ideas, memoranda, specifications, plans, procedures, drawings, descriptions, computer program data, input record data, written information, and other materials either created by or provided to Consultant in connection with the performance of this Agreement shall be held confidential by Consultant, except as otherwise directed by City's Contract Administrator. Nothing furnished to Consultant which is otherwise known to the Consultant or is generally known, or has become known, to the related industry shall be deemed confidential. Consultant shall not use City's name or insignia, photographs of the Project, or any publicity pertaining to the Services or the Project in any magazine, trade paper, newspaper, television or radio production, website, or other similar medium without the prior written consent of the City.

18. **Ownership of Documents.** All reports, maps, drawings and other contract deliverables prepared under this Agreement by Consultant shall be and remain the property of City. Consultant shall not release to others information furnished by City without prior express written approval of City.

19. **Copyrights.** Consultant agrees that any work prepared for City which is eligible for copyright protection in the United States or elsewhere shall be a work made for hire. If any such work is deemed for any reason not to be a work made for hire, Consultant assigns all right, title and interest in the copyright in such work, and all extensions and renewals thereof, to City, and agrees to provide all assistance reasonably requested by City in the establishment, preservation and enforcement of its copyright in such work, such assistance to be provided at City's expense but

without any additional compensation to Consultant. Consultant agrees to waive all moral rights relating to the work developed or produced, including without limitation any and all rights of identification of authorship and any and all rights of approval, restriction or limitation on use or subsequent modifications.

20. **Conflict of Interest.** Consultant, for itself and on behalf of the individuals listed in Exhibit "C," represents and warrants that by the execution of this Agreement, they have no interest, present or contemplated, in the Project affected by the above-described Services. Consultant further warrants that neither Consultant, nor the individuals listed in Exhibit "C" have any real property, business interests or income interests that will be affected by this project or, alternatively, that Consultant will file with the City an affidavit disclosing any such interest.

21. **Solicitation.** Consultant warrants that Consultant has not employed or retained any person or agency to solicit or secure this Agreement, nor has it entered into any agreement or understanding for a commission, percentage, brokerage, or contingent fee to be paid to secure this Agreement. For breach of this warranty, City shall have the right to terminate this Agreement without liability and pay Consultant only for the value of work Consultant has actually performed, or, in its sole discretion, to deduct from the Agreement price or otherwise recover from Consultant the full amount of such commission, percentage, brokerage or commission fee. The remedies specified in this section shall be in addition to and not in lieu of those remedies otherwise specified in this Agreement.

22. **General Compliance With Laws.** Consultant shall keep fully informed of federal, state and local laws and ordinances and regulations which in any manner affect those employed by Consultant, or in any way affect the performance of services by Consultant pursuant to this Agreement. Consultant shall at all times observe and comply with all such laws, ordinances and regulations, and shall be solely responsible for any failure to comply with all applicable laws, ordinances and regulations. Consultant represents and warrants that Consultant has obtained all necessary licenses to perform the Scope of Services and that such licenses are in good standing. Consultant further represents and warrants that the services provided herein shall conform to all ordinances, policies and practices of the City of Riverside.

23. **Waiver.** No action or failure to act by the City shall constitute a waiver of any right or duty afforded City under this Agreement, nor shall any such action or failure to act constitute approval of or acquiescence in any breach thereunder, except as may be specifically, provided in this Agreement or as may be otherwise agreed in writing.

24. **Amendments.** This Agreement may be modified or amended only by a written agreement and/or change order executed by the Consultant and City.

25. **Termination.** City, by notifying Consultant in writing, shall have the right to terminate any or all of Consultant's services and work covered by this Agreement at any time. In the event of such termination, Consultant may submit Consultant's final written statement of the amount of Consultant's services as of the date of such termination based upon the ratio that the work completed bears to the total work required to make the report complete, subject to the City's rights under Sections 15 and 26 hereof. In ascertaining the work actually rendered through the termination



date, City shall consider completed work, work in progress and complete and incomplete reports and other documents only after delivered to City.

25.1 Other than as stated below, City shall give Consultant thirty (30) days' prior written notice prior to termination.

25.2 City may terminate this Agreement upon fifteen (15) days' written notice to Consultant, in the event:

25.2.1 Consultant substantially fails to perform or materially breaches the Agreement; or

25.2.2 City decides to abandon or postpone the Project.

26. **Offsets.** Consultant acknowledges and agrees that with respect to any business tax or penalties thereon, utility charges, invoiced fee or other debt which Consultant owes or may owe to the City, City reserves the right to withhold and offset said amounts from payments or refunds or reimbursements owed by City to Consultant. Notice of such withholding and offset, shall promptly be given to Consultant by City in writing. In the event of a dispute as to the amount owed or whether such amount is owed to the City, City will hold such disputed amount until either the appropriate appeal process has been completed or until the dispute has been resolved.

27. **Successors and Assigns.** This Agreement shall be binding upon City and its successors and assigns, and upon Consultant and its permitted successors and assigns, and shall not be assigned by Consultant, either in whole or in part, except as otherwise provided in paragraph 9 of this Agreement.

28. **Venue.** Any action at law or in equity brought by either of the parties hereto for the purpose of enforcing a right or rights provided for by this Agreement shall be tried in the Superior Court, County of Riverside, State of California, and the parties hereby waive all provisions of law providing for a change of venue in such proceedings to any other county. In the event either party hereto shall bring suit to enforce any term of this Agreement or to recover any damages for and on account of the breach of any term or condition of this Agreement, it is mutually agreed that each party will bear their own attorney's fees and costs.

29. **Nondiscrimination.** During Consultant's performance of this Agreement, Consultant shall not discriminate on the grounds of race, religious creed, color, national origin, ancestry, age, physical disability, mental disability, medical condition, including the medical condition of Acquired Immune Deficiency Syndrome (AIDS) or any condition related thereto, marital status, sex, genetic information, gender, gender identity, gender expression, or sexual orientation, military and veteran status, in the selection and retention of employees and subcontractors and the procurement of materials and equipment, except as provided in Section 12940 of the California Government Code. Further, Consultant agrees to conform to the requirements of the Americans with Disabilities Act in the performance of this Agreement.

30. **Severability.** Each provision, term, condition, covenant and/or restriction, in whole and in part, of this Agreement shall be considered severable. In the event any provision, term,

condition, covenant and/or restriction, in whole and/or in part, of this Agreement is declared invalid, unconstitutional, or void for any reason, such provision or part thereof shall be severed from this Agreement and shall not affect any other provision, term, condition, covenant and/or restriction of this Agreement, and the remainder of the Agreement shall continue in full force and effect.

31. **Authority.** The individuals executing this Agreement and the instruments referenced herein on behalf of Consultant each represent and warrant that they have the legal power, right and actual authority to bind Consultant to the terms and conditions hereof and thereof.

32. **Entire Agreement.** This Agreement constitutes the final, complete, and exclusive statement of the terms of the agreement between the parties pertaining to the subject matter of this Agreement, and supersedes all prior and contemporaneous understandings or agreements of the parties. Neither party has been induced to enter into this Agreement by and neither party is relying on, any representation or warranty outside those expressly set forth in this Agreement.

33. **Interpretation.** City and Consultant acknowledge and agree that this Agreement is the product of mutual arms-length negotiations and accordingly, the rule of construction, which provides that the ambiguities in a document shall be construed against the drafter of that document, shall have no application to the interpretation and enforcement of this Agreement.

33.1 Titles and captions are for convenience of reference only and do not define, describe or limit the scope or the intent of the Agreement or any of its terms. Reference to section numbers, are to sections in the Agreement unless expressly stated otherwise.

33.2 This Agreement shall be governed by and construed in accordance with the laws of the State of California in effect at the time of the execution of this Agreement.

33.3 In the event of a conflict between the body of this Agreement and Exhibit "A" - Scope of Services hereto, the terms contained in Exhibit "A" shall be controlling.

34. **Exhibits.** The following exhibits attached hereto are incorporated herein to this Agreement by this reference:


Exhibit "A" - Scope of Services  
Exhibit "B" - Compensation  
Exhibit "C" - Key Personnel

IN WITNESS WHEREOF, City and Consultant have caused this Agreement to be duly executed the day and year first above written.

CITY OF RIVERSIDE, a California  
charter city and municipal corporation

ORSA CONSULTING ENGINEERS, INC.,  
a California corporation


By: \_\_\_\_\_  
City Manager

By:   
MISHA DAVOODIAN  
[Printed Name]  
VICE PRESIDENT  
[Title]


Attest: \_\_\_\_\_  
City Clerk

Certified as to Availability of Funds:

By:   
Chief Financial Officer

By:   
DAVID HAFEZIZADEH  
[Printed Name]  
SECRETARY  
[Title]

Approved as to Form:

By:   
Deputy City Attorney

**EXHIBIT "A"**

**SCOPE OF SERVICES**

## **SCOPE OF SERVICES**

This study shall provide Arc Flash Study for all energized electrical equipment at the Water Quality Control Plant in accordance with the scope of work provided below. Table 1 – 2018 Arc Flash Service Data along with Figure 1.1 - 2017 Existing Facilities lists all the electrical equipment that needs to be tested for the Arc Flash Study. A copy of Overall Plant Single line diagram is included in Attachment No. 1

The selected firm shall provide an Arc Flash Hazard Study to determine potential arc flash incident energies, arc flash boundaries, shock hazard boundaries and required personal protective equipment (PPE) for all energized electrical equipment, and arc flash and shock hazard warning labels.

The arc flash study shall begin with the utility company's feeder protective device and include all of the electrical distribution equipment down to and including low voltage motor control centers and power distribution panelboards and lighting panels. All information required to perform the study shall be obtained by the entity performing the study.

Unless otherwise noted, the study shall include all electrical equipment from the normal power source or sources to and including all electrical panels with voltage greater than 120 volts.

The selected firm shall perform the tasks as described in the Scope of Work of this Request for Proposals (RFP). The City intends to select the most qualified firm for the project. Proposals shall be evaluated by City's Screening and Selection Committee on the basis of professional expertise in preparing power system analysis, past work on previous Arc Flash Hazard Study, qualifications and experience of staff proposed to work on the project.

### **A. General**

1. The Arc Flash Hazard Study shall be performed in accordance with the latest applicable NFPA, IEEE, and ANSI Standards. Provide calculation methods and assumptions, typical calculations, tabulations of calculation quantities and results, conclusions, and recommendations.
2. Calculate equipment arc gap.
3. Calculate bolted and estimated arcing fault current at the fault point.
4. Calculate trip time, opening time, and total clearing time (total arc time) of the protective device.
5. Calculate worst-case arc flash boundary for each bus/panel.
6. Calculate worst-case arc flash hazard energy in  $\text{cal/cm}^2$  for each bus/panel and establish the Arc Flash Hazard/Risk Categories.
7. Determine worst-case Personal Protective Equipment (PPE) for each bus/panel.
8. Calculate shock hazard approach boundaries (limited approach boundary, restricted approach boundary, and prohibited approach boundary).

9. Provide recommendations to reduce arc flash hazard energy and exposure.
10. List electrical equipment not in code compliance.

**B. Study Report**

1. The Arc Flash Study report shall be bound in a standard 8-1/2-in by 11-in size report. Two (2) bound copies of the final report with a CD containing electronic files in both source format and a searchable Portable Document Format (PDF) shall be submitted to the City for review and approval.
2. The report shall include the following sections and information:
  - a. An executive summary outlining the distribution system, the information received from the power company, assumptions made to complete the report and recommendations to reduce the arc flash values.
  - b. Descriptions, purpose, basis, and scope of study.
  - c. Tabulations of equipment arc gap and bolted and estimated arcing fault current at the fault point.
  - d. Tabulations of trip time, opening time, and total clearing time, (total arc time) for each protective device.
  - e. Tabulations of worst-case arc flash hazard incident energy and worst-case PPE for each bus/panel.
  - f. Tabulations of shock hazard approach boundaries (limited approach boundary, restricted approach boundary, and prohibited approach boundary).
  - g. Recommendations to reduce arc flash hazard energy and exposure.
  - h. Provide all data files in pdf format as part of an Appendix in the study.
  - i. Provide a detailed bus label for each fault location. Each label shall include a listing of the protective device settings and incident energy at several different working distances.
  - j. Provide an NFPA 70 E work permit form for each fault location.
  - k. Provide a bus label for each fault location. The label shall include a summary of the flash boundary, incident energy, PPE classification and the Limited, Restricted and Prohibited Approach boundaries based on the nominal system voltage.
  - l. PPE Table – Provide a PPE table that defines the Personnel Protective Equipment classes and clothing descriptions identified in the reports and labels.

C. Warning Labels

1. Warning labels shall be 4" x 6" UV resistant vinyl labels (white label with orange warning stripe and black letters). Sample warning label is presented at the end of this section.
2. Firm performing the Study shall provide and install labels at each location. All the labels shall be submitted to the City for final approval.
3. For outdoor electrical panels (NEMA 1 MCC in NEMA 3R wrapper), warning labels shall be provided on outer doors every four feet. Warning labels shall include the following information:
  - a. "WARNING, ARC FLASH AND SHOCK HAZARD, APPROPRIATE PPE REQUIRED".
  - b. Flash hazard boundary.
  - c.  $\text{Cal/cm}^2$  flash hazard for worst-case.
  - d. Worst case PPE level and list required PPE.
  - e. Shock hazard when cover is removed.
  - f. Limited approach distance and list required PPE.
  - g. Restricted approach distance and list required PPE.
4. For all electrical panels without a NEMA 3R wrapper (stand-alone panels), one warning labels shall be provided every four feet. Warning labels shall include the following minimum information:
  - a. "WARNING, ARC FLASH AND SHOCK HAZARD, APPROPRIATE PPE REQUIRED".
  - b. Flash hazard boundary.
  - c.  $\text{Cal/cm}^2$  flash hazard for worst-case.
  - d. Worst case PPE level and list required PPE.
  - e. Shock hazard when cover is removed.
  - f. Limited approach distance and list required PPE.
  - g. Restricted approach distance and list required PPE.



## WARNING

### Arc Flash and Shock Hazard Appropriate PPE Required

**24 inch** Flash Hazard Boundary

**3 cal/cm<sup>2</sup>** Flash Hazard at 18 inches

PPE Level, **1 Layer 6 oz Nomex®**,

*Leather Gloves, Faceshield*

**480 VAC** Shock Hazard when Cover is removed

**42 inch** Limited Approach

**12 inch** Restricted Approach - **500 V Class 00** Gloves

**1 inch** Prohibited Approach - **500 V Class 00** Gloves

Equipment Name: *Slurry Pump Starter*



Table 1 - 2018 Arc Flash Service Data

Location	Last Service Date	Vendor	Volts	Type	Last Arc Flash	Vendor	Units	Facility Area # as shown on Fig 1.1 - Existing Facilities Layout
Headworks	Sep-16	Hampton/Tedder	480	Square D	Jul-08	Wunderlich-Malec	40 Bkts/3 Lrg Main/2 Ught Panels	3
ATS	Jun-14	EPC	480	Asco	Oct-08	Wunderlich-Malec	1 ATS	3
Headworks Power Dist/STR-PWR-003	Sep-16	Hampton/Tedder	480	Square D	Sep-08	Wunderlich-Malec	5 Sml Swgrs / 1 Ught Panel	3
P.B. 007	Nov-14	Emerson	480	Allen Bradley	Apr-15	Emerson	55 Bkts/2 Main/2 Ties/14 VFD/2 LP/2 Mains Outside(N)	45
P.S. #15/ACT-PRI-MCC-002			480	Allen Bradley	Oct-08	Wunderlich-Malec	8 Bkts/1 Lrg Main/1 Ught Panel	11
Chiller			480	Westinghouse	Dec-11	Wunderlich-Malec	11 Buckets/1 Lrg Main	50
Admin			480	Westinghouse	Dec-11	Wunderlich-Malec	15 Bkts/2 Lrg Main/7 Ught Panels	49
P.S. #4/ACT-PRI-MCC-001			480	Allen Bradley	Oct-08	Wunderlich-Malec	9 Bkts/1 Lrg Main/1 Ught Panel	11
P.S. #9/MCC J			480	Allen Bradley	4/1/15 - 10/01/08	Emerson	10 Bkts/3 Lrg Main/1 LP/1 ATS	25
Old Ops			480	Westinghouse	10/01/08 - 7/1/08	Wunderlich-Malec	21 Bkts/4 Lrg Main/2 Ught Panel	51
P.S. #10 Upstairs/Downstairs			480	General Electric	10/01/08 - 7/1/08	Wunderlich-Malec	38 Bkts/6 Brkr/1 LP/2 Mains	6
P.S. #6/ACT-SEC-MCC-002			480	Hatch	Oct-08	Wunderlich-Malec	10 Bkts/1 Main/1 Ught Panel	42
W Switchgear			480	Square D	Jul-16	Wunderlich-Malec	18 Bkts/1 Main/2 Gen Brkr	45
M Switchgear			480	Square D	12/1/11 - 7/1/16	Wunderlich-Malec	13 Bkts/1 Main/1 Tie/1 Gen Brkr	45
P.S. #17/ACT-SEC-MCC-001			480	General Electric	10/01/08 - 7/1/08	Wunderlich-Malec	7 Bkts/1 Main/1 XFMR/1 Ught Panel	42
Fine Screens	Nov-15	Emerson	480	Eaton	Apr-15	Emerson	5 Dis/1 ATS/3 Ught Panels	16
P.S. #16 (N)			480	General Electric	10/01/08 - 7/1/08	Wunderlich-Malec	11 Bkts/8 VFD/1 Ught Panel	43
P.S. #16 (S)			4160	IEM	Jul-16	Wunderlich-Malec	12 SWGR/2 Dis	43
P.S. #21			480	Allen Bradley	Sep-08	OOS	Out Of Service	9
P.S. #19/MCC R			480	General Electric	4/1/08 - 10/1/08	Wunderlich-Malec	16 Bkts/1 Main/1 Ught Panel	24
Boiler Bldg/STR-DCS-001			480	Allen Bradley	7/1/08 - 4/1/15	Wunderlich-Malec	42 Bkts/1 Lrg Main/1 Ught Panel	24
PWR DIST #1/STR-PWR-001	Oct-14	Emerson	480	Allen Bradley	10/1/08 - 4/1/15	Emerson	2 Dis - 4160V/13 Brkr	45
DAF / STR-MCC-001			480	Allen Bradley	4/1/15 - 10/01/08	Emerson	23 Bkts/ 1 Main/ 1 Ught Panel	29
FDG / STR-PWR-006	Oct-14	Emerson	480	Allen Bradley	Apr-15	Emerson	37 Bkts/2 Main/2 Tie/1 L.P.	35
DIG 3&4/STR-DCS-002	Nov-14	Emerson	480	Allen Bradley	Apr-15	Emerson	36 Bkts/2 Main/2 Tie/1 L.P.	24
Dewatering			480	Allen Bradley	10/1/08 - 02/1/13	Power Studies	24 Bkts/1 Main/1 Ught Panel	32
MSL BLDG			480/240	Square D	Sep-08	Wunderlich-Malec	17 Bkts/2 Main/1 Tie/2 L.P.	51
CCB #2			480	Square D	Dec-11	Wunderlich-Malec	98Bkts/1 Main/3 VFD's/1 Ught Panel	9
PWR DIST #2/STR-PWR-002 (N)			480	Cutler Hammer	Apr-15	Emerson	13 Bkts/1 Main/2 Ught Panels	20
MCC BLWR			4160	Allen Bradley	10/01/08 - 7/1/08	Wunderlich-Malec	6 Dis/1 Tie/2 Swgr/2 L.P/18 Bkts/2 Main/1 XFMR/17 Brkr	20
PWR DIST #2/STR-PWR-002 (S)		Switchgear	480	IEM	10/1/08 - 7/1/16	Wunderlich-Malec	6 Brkr/2 Main/1 Tie/2 Lrg Dis-4160V	20
P.S. #22/SEC-MCC-001			480	Allen Bradley	Oct-08	Wunderlich-Malec	24 Bkts/8 VFD/1 Main Lrg/1 L. P.	17
New Chem Bldg		Emerson	480	Allen Bradley	Oct-08	Wunderlich-Malec	18 Bkts/2 Lrg Main/2 Ught Panel	22
FCE / MCC-MS			480	Square D	Jul-08	Wunderlich-Malec	8 Bkts/1 Lrg Main/2 LP/1 XFMR	2
CCB #3 / MCC-CCB			480	Square D	Sep-08	Wunderlich-Malec	10 Bkts/1 Lrg Main/1 LP/1 XFMR	9
MBR MCC	Apr-15	Emerson	480	Allen Bradley	Mar-15	Emerson	36 Sml Bkts/22 VFD Bkts	19
MBR MCC-Back wall	Feb-15	Emerson	480	Square D	Feb-15	Emerson	26 Sml/12 Med/6 Lrg Bkts/5 L.P.	19
MBR MCC - North Outside			480	Eaton	Apr-15	Emerson	2 Lrg Mains	19
Tertiary SWGR FC/FD MCC-003			480	Square D	Sep-15	Wunderlich-Malec	16 Bkts/2 Mains/1 Tie	8
Tertiary / Westside MCC-003			480	Square D	Sep-08	Wunderlich-Malec	46 Bkts/1 Main/3 Lrg VFD/1 L.P.	8
Tertiary / Westside MCC-004			480	Square D	Sep-08	Wunderlich-Malec	43 Bkts/1 Main/1 L.P.	8

**Table 1 - 2018 Arc Flash Service Data**

Location	Last Service Date	Vendor	Volts	Type	Last Arc Flash	Vendor	Units	Facility Area # as shown on Fig 1.1 - Existing Facilities Layout
Tertiary / Eastside MCC-001			480	Square D	Jul-08	Wunderlich-Malec	18 Bkts/1 Main/3 Lrg VFD/1 L.P.	8
Tertiary / Eastside MCC-002			480	Square D	Jul-08	Wunderlich-Malec	19 Bkts/1 Main/2 Small VFD	8
Fuel Cell	Jun-16	PowerTE	12.5 KV	IEM	Dec-11	Power Studies	1 Lrg Brkr	47
Cogen 52U	Jul-17	EPC	12.5 KV	ASCO		N/A	1 Lrg Brkr	48
Cogen DS-AUX	Jul-17	EPC	12.5 KV	ASCO	Jul-17	Emerson	1 Lrg Brkr	48
Cogen 52 TS	Jul-17	EPC	12.5 KV	ASCO		N/A	1 Lrg Brkr	48
Cogen 52 DM	Jul-17	EPC	12.5 KV	ASCO		N/A	1 Lrg Brkr	48
Cogen MCC-1N			480	Square D	Jul-08	Wunderlich-Malec	24 Bkts/5 Med Brkr	48
Cogen MCC-2N			480	Square D	Jul-08	Wunderlich-Malec	23 Bkts/4 Light Panels	48
Cogen MCC-3N			480	Square D	Jul-08	Wunderlich-Malec	19 Bkts	48
Cogen MCC PPIE			480	Square D	Jul-08	Wunderlich-Malec	6 Brkrs	48
Cogen Switchgear 52N	Jul-17	EPC	12.5 KV	Square D	Apr-15	Emerson	1 Lrg Brkr	46
Cogen Switchgear 52L	Jul-17	EPC	12.5 KV	Square D	Apr-15	Emerson	1 Lrg Brkr	46
Cogen Switchgear 52E	Jul-17	EPC	12.5 KV	Square D	Apr-15	Emerson	1 Lrg Brkr	46
PWR-GEN-001	Sep-13	Emerson	480	Square D	Apr-15	Emerson	1 Lrg Brkr/1 SmI @ Gen	46
PWR-GEN-002	Sep-13	Emerson	480	Square D	Apr-15	Emerson	1 Lrg Brkr/1 SmI @ Gen	46
PWR-GEN-003 4160V	Aug-15	Emerson	4160	Square D	Apr-15	Emerson	3 Switch Brkrs	46
PWR-GEN-004 4160V	Aug-15	Emerson	4160	Square D	Apr-15	Emerson	3 Switch Brkrs	46
PWR-GEN-005 480V	Aug-15	Emerson	480	Eaton	Apr-15	Emerson	1 Lrg Brkr	46
PWR-GEN-006 480V	Aug-15	Emerson	480	Eaton	Apr-15	Emerson	1 Lrg Brkr	46

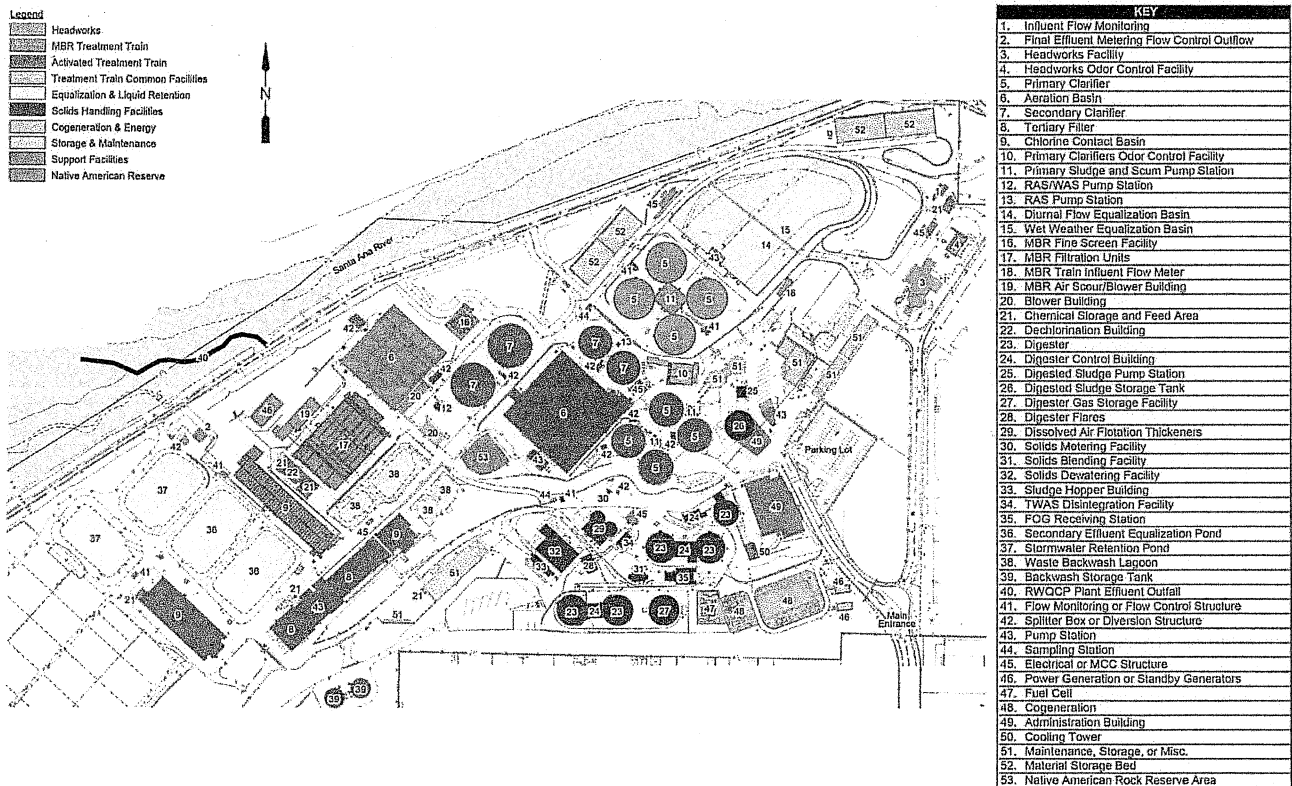


Figure 1.1 2017 Existing Facilities Layout

**ATTACHMENT NO. 1**

**Overall Plant Single Line Diagram I and II  
T-46 – Sheets 000-E-011 and 000-E-012**







[illegible]



# **STATEMENT OF UNDERSTANDING AND APPROACH**

Riverside Public Works RFP 1860 – January 2019

## ***Statement of Understanding***

The City of Riverside Public Works Department – Wastewater Division requires contract administration, staff supplementation and consultant expertise in order to deliver a backlog of Arc Flash Hazard study to determine potential arc flash incident energies, arc flash boundaries, shock hazard boundaries and required personal protective equipment (PPE) for all energized electrical equipment, and arc flash and shock hazard warning labels at the Water Quality Control Plant in accordance with the scope of work provided.

## ***What We Do***

ORSA Consulting Engineers, Inc Team has been working in the electrical power system studies since 2000. For this project ORSA will provide a comprehensive scope of services necessary to achieve the City's arc flash project delivery goals. In fact, for the past 18 years we have and continue to provide the same scope of services to industrial, institutional & commercial projects. This includes services from initial data gathering to complete report submission. We will accomplish this by working very closely with City staff as partners for project delivery.

## ***Our Approach***

Our driving philosophy is that we exist to help our clients accomplish their goals correctly and responsibly in a timely manner. Doing this requires us to be intelligent, flexible, proactive, strategic, diligent and excellent communicators. Acting as both staff extension and technical/management advisors, we provide the expertise necessary manage project scopes, budgets and schedules for successful delivery.

## ***Scope of Work***

Our study will provide Arc Flash Study for all energized electrical equipment at the Water Quality Control Plant in accordance with the scope of work provided in RFP 1860. Table 1 – 2018 Arc Flash Service Data along with Figure 1.1 - 2017 Existing Facilities of the RFP 1860 lists all the electrical equipment that needs to be included for the Arc Flash Study, based on the Overall Plant Single line diagram which is included in Attachment No. 1 of the RFP 1860.

ORSA will provide an Arc Flash Hazard Study to determine potential arc flash incident energies, arc flash boundaries and shock hazard boundaries for all energized electrical equipment and arc flash and shock hazard warning labels.

The arc flash study will be coordinated with the utility company's feeder protective device and will include all of the electrical distribution equipment down to and including low voltage motor control centers and power distribution panel-boards and lighting panels. All information required to perform the study will be obtained by ORSA.

Unless otherwise noted, the study will include all electrical equipment from the normal power source or sources to and including all electrical panels with voltage greater than 120 volts (i.e. 208 volts & above).

Scope of the work has been based on latest edition of NFPA 70E (i.e. 2018).

Addendum number 1, 2, & 3 are acknowledged.

Tasks listed in the Scope of Work for Request for Proposal No. 1860 are described and summarized as follows showing our understanding of each requirement:

### **TASK 1 – General**

1. The Arc Flash Hazard Study will be performed in accordance with the latest applicable NFPA, IEEE, and ANSI Standards. ORSA will provide calculation methods and assumptions, typical calculations, tabulations of calculation quantities and results, conclusions, and recommendations.
2. Equipment arc gap will be included in the report.
3. Bolted short circuit current and calculated arcing fault current will be provided at the fault point.
4. Trip time, opening time, and total clearing time (total arc time) of the protective device will be provided.
5. Worst-case arc flash boundary for each bus/panel will be calculated.
6. Worst-case arc flash hazard energy in cal/cm<sup>2</sup> for each bus/panel will be calculated.
7. Shock hazard approach boundaries (limited approach boundary and restricted approach boundary) will be calculated.
8. Recommendations to reduce arc flash hazard energy and exposure will be provided.
9. List of electrical equipment not in code compliance will be provided.

### **TASK 2 - Study Report**

1. The Arc Flash Study report will be bound in a standard 8-1/2-in by 11-in size report. Two (2) bound copies of the final report with a CD containing electronic files in both source format and a searchable Portable Document Format (PDF) will be submitted to the City for review and approval.
2. The report will include the following sections and information:
  - a. An executive summary outlining the distribution system, the information received from the power company, assumptions made to complete the report and recommendations to reduce the arc flash values.
  - b. Descriptions, purpose, basis, and scope of study.
  - c. Tabulations of equipment arc gap and bolted and estimated arcing fault current at the fault point.
  - d. Tabulations of trip time, opening time, and total clearing time, (total arc time) for each protective device.
  - e. Tabulations of worst-case arc flash hazard incident energy and worst-case incident energy for each bus/panel.
  - f. Tabulations of shock hazard approach boundaries (limited approach boundary and restricted approach boundary).
  - g. Recommendations to reduce arc flash hazard energy and exposure.
  - h. Provide all data files in pdf format as part of an Appendix in the study.

- i. Provide a detailed bus label for each fault location. Each label shall include a listing of the protective device settings and incident energy at required different working distances.
- j. Provide an NFPA 70 E work permit form for each fault location.
- k. Provide a bus label for each fault location. The label shall include a summary of the flash boundary, incident energy and the Limited and Restricted Approach boundaries based on the nominal system voltage.
- l. PPE Table – Provide a PPE table that defines the Personnel Protective Equipment classes and clothing descriptions identified in the reports.

### **TASK 3 - Warning Labels**

1. Warning labels will be 4" x 6" UV resistant vinyl labels (white label with orange warning stripe and black letters) based on the sample provided in RFP.
2. ORSA will provide and install labels at each location. All the labels will be submitted to the City for final approval.
3. For outdoor electrical panels (NEMA 1 MCC in NEMA 3R wrapper), warning labels will be provided on outer doors every four feet. Warning labels will include the following information:
  - a. Flash hazard boundary.
  - b. Cal/cm<sup>2</sup> flash hazard for worst-case.
  - c. Shock hazard when cover is removed.
  - d. Limited approach distance and list required PPE.
  - e. Restricted approach distance and list required PPE.
4. For all electrical panels without a NEMA 3R wrapper (stand-alone panels), one warning labels will be provided every four feet. Warning labels shall include the following minimum information:
  - a. Flash hazard boundary.
  - b. Cal/cm<sup>2</sup> flash hazard for worst-case.
  - c. Shock hazard when cover is removed.
  - d. Limited approach distance and list required PPE.
  - e. Restricted approach distance and list required PPE.

EMPLOYEE	HOURS	HOURLY RATE	TOTAL COST	MEETINGS (HRS/\$)	FIELD DATA GATHERING (HRS/\$)	STUDY REPORTS & REVIEW (HRS/\$)	SCHEDULE MONITORING & CONTROL (HRS/\$)
Hrand Avanesian	120	\$ 175.0	\$ 21,000.00	20/3,500	30/5,250	60/10,500	10/1,750
Misha Davoodian	60	\$ 175.0	\$ 10,500.00	10/1,750		40/7,000	10/1,750
Al Fonseca	60	\$ 105.0	\$ 6,300.00	10/1,050			50/5,250
Leo Mardirosian	580	\$ 80.00	\$ 46,400.00		240/19,200	340/27,200	
General Electrician	240	\$ 105.0	\$ 25,200.00		240/25,200		
	<b>1060</b>		<b>\$ 109,400.00</b>	40/6,300	510/49,650	440/44,700	70/8,750

PROJECT SCHEDULE								
2019					2020		HOURS	COST \$
NO	ACTIVITIES	SEP	OCT	NOV	DEC	JAN	FEB	
1	K.O.M.							10
2	DATA GATHERING	●	—————	●	—————	●	—————	510
3	PRELIMINARY REPORT	●	—————	●				240
4	CITY COMMENTS 1			●	●			20
5	PRE-FINAL REPORT 1				●	●		80
6	CITY COMMENTS 2				●	●		20
7	PRE-FINAL REPORT 2					●	●	80
8	CITY FINAL COMMENTS 2						●	20
9	FINAL REPORT						●	80
								1060
								109,400

	SEP	OCT	NOV	DEC	JAN	FEB	
	HRS/\$						
HRAND	30 5,250	30 5,250	30 5,250	10 1,750	10 1,750	10 1,750	120 21,000
MISHA	10 1,750	10 1,750	10 1,750	10 1,750	10 1,750	10 1,750	60 10,500
AL	10 1,050	10 1,050	10 1,050	10 1,050	10 1,050	10 1,050	60 6,300
LEO	160 12,800	160 12,800	160 12,800	50 4,000	30 2,400	20 1,600	580 46,400
G/TECH	60 6,300	60 6,300	60 6,300	30 3,150	20 2,100	10 1,050	240 25,200
<b>HRS</b>	<b>270</b>	<b>270</b>	<b>270</b>	<b>110</b>	<b>80</b>	<b>60</b>	<b>1060</b>
<b>COST \$</b>	<b>27,150</b>	<b>27,150</b>	<b>27,150</b>	<b>11,700</b>	<b>9,050</b>	<b>7,200</b>	<b>109,400</b>

**EXHIBIT "B"**  
**COMPENSATION**

EMPLOYEE	HOURS	HOURLY RATE	TOTAL COST	MEETINGS (HRS/\$)	FIELD DATA GATHERING (HRS/\$)	STUDY REPORTS & REVIEW (HRS/\$)	SCHEDULE MONITORING & CONTROL (HRS/\$)
Hrand Avanesian	120	\$ 175.0	\$ 21,000.00	20/3,500	30/5,250	60/10,500	10/1,750
Misha Davoodian	60	\$ 175.0	\$ 10,500.00	10/1,750		40/7,000	10/1,750
Al Fonseca	60	\$ 105.0	\$ 6,300.00	10/1,050			50/5,250
Leo Mardirosian	580	\$ 80.00	\$ 46,400.00		240/19,200	340/27,200	
General Electrician	240	\$ 105.0	\$ 25,200.00		240/25,200		
	<b>1060</b>		<b>\$ 109,400.00</b>	<b>40/6,300</b>	<b>510/49,650</b>	<b>440/44,700</b>	<b>70/8,750</b>

PROJECT SCHEDULE								
			2019				2020	
NO	ACTIVITIES	SEP	OCT	NOV	DEC	JAN	FEB	HOURS
1	K.O.M.							10
2	DATA GATHERING	●	●	●	●	●	●	510
3	PRELIMINARY REPORT	●	●	●				240
4	CITY COMMENTS 1			●	●			20
5	PRE-FINAL REPORT 1				●	●		80
6	CITY COMMENTS 2					●	●	20
7	PRE-FINAL REPORT 2					●	●	80
8	CITY FINAL COMMENTS 2						●	20
9	FINAL REPORT						●	80
								1060
								109,400

	SEP	OCT	NOV	DEC	JAN	FEB	
	HRS/\$						
HRAND	30 5,250	30 5,250	30 5,250	10 1,750	10 1,750	10 1,750	120 21,00
MISHA	10 1,750	10 1,750	10 1,750	10 1,750	10 1,750	10 1,750	60 10,500
AL	10 1,050	10 1,050	10 1,050	10 1,050	10 1,050	10 1,050	60 6,300
LEO	160 12,800	160 12,800	160 12,800	50 4,000	30 2,400	20 1,600	580 46,400
G/TECH	60 6,300	60 6,300	60 6,300	30 3,150	20 2,100	10 1,050	240 25,200
<b>HRS</b>	<b>270</b>	<b>270</b>	<b>270</b>	<b>110</b>	<b>80</b>	<b>60</b>	<b>1060</b>
<b>COST \$</b>	<b>27,150</b>	<b>27,150</b>	<b>27,150</b>	<b>11,700</b>	<b>9,050</b>	<b>7,200</b>	<b>109,400</b>

**EXHIBIT "C"**

**KEY PERSONNEL**

## COMPANY PERSONNEL (WORKING ON THIS PROJECT)

Name	Title	Phone	Email
Misha Davoodian	Principal Electrical Engineer	(714) 441-2323 x-214	<a href="mailto:Mishad@orsaeng.com">Mishad@orsaeng.com</a>
Hrand Avanesian	Principal Electrical Engineer	(714) 441-2323 x-212	<a href="mailto:Hranda@orsaeng.com">Hranda@orsaeng.com</a>
Al Fonseca	Sr. Design Utility Engineer	(714) 441-2323 x-220	<a href="mailto:Alf@orsaeng.com">Alf@orsaeng.com</a>
Leo Mardirosian	Electrical Engineer	(714) 441-2323 x-213	<a href="mailto:Leom@orsaeng.com">Leom@orsaeng.com</a>

## EXPERIENCE AND REFERENCES

ORSA Consulting Engineers, Inc. has over 30 years of experience with legally registered business names providing the services similar to those described in the Scope of Services of RFP 1860. The resumes of our staff are included in the Appendix.

Hrand Avanesian has over 40 years of electrical systems engineering and management experience in oil, gas, petrochemical, heavy industry, pump and compressor station, water treatment, steel, aluminum and titanium complex, substations, solar systems and utility interconnection, as well as institutional and commercial buildings. Following tasks have been carried out repeatedly: load estimation, short circuit calculation, coordination study, load flow study, power system protection, arc flash calculation, harmonic study, reliability study, grounding study, single line diagram, power distribution system in industrial plants and commercial & institutional buildings, lighting calculation & design, grounding & lightning, voltage drop calculation, motor starting study, hazardous area classification, cathodic protection (of pipeline & tank), battery sizing, emergency & standby power system, uninterruptible power system, variable frequency drives, preparation of technical specifications, power factor correction, LV&MV substations, LV&MV motor control centers, cable tray & conduit layouts, equipment layout drawings. Experience with international firms like IMEG (UK), CREST (USA), Bounaccorsi & Associates (USA), ABB (Italy), Italimpianti (Italy), ORSA (USA), Tecnimont (Italy), IMEG (Nigeria), Crouse-Hinds (USA), Unacomm (UAE), Shinwha (Korea) and DALE (UK), Parsons (USA).