

PROFESSIONAL SERVICES AGREEMENT

THIS PROFESSIONAL SERVICES AGREEMENT, hereinafter referred to as AGREEMENT, is made and entered into and is to be effective the 25th day of March, 2020, by and between the ORANGE COUNTY SANITATION DISTRICT, hereinafter referred to as "SANITATION DISTRICT", and SEL Engineering Services Inc., for purposes of this AGREEMENT hereinafter referred to as "CONSULTANT". The SANITATION DISTRICT and CONSULTANT are referred to herein collectively as the "Parties" or individually as a "Party."

WITNESSETH:

WHEREAS, the SANITATION DISTRICT desires to engage a consultant for OCSD Project No. J-98, (Project) to provide support services for J-98 - Electrical Power Distribution System Improvements, to provide professional services and provide support services for both 480V and 12kV electrical power distribution systems including modifications to double-ended switchgear, transformers, MCCs, breakers, and conductors.; and,

WHEREAS, CONSULTANT satisfies all qualification requirements identified in this AGREEMENT and agrees to provide the professional services and equipment specified herein; and,

WHEREAS, the SANITATION DISTRICT has adopted procedures for the selection of professional services and equipment and has proceeded in accordance with said procedures to select CONSULTANT to perform this work; and,

WHEREAS, at its regular meeting on March 25, 2020, the Board of Directors, by Minute Order, accepted the recommendation of the Operations Committee to approve this AGREEMENT between the SANITATION DISTRICT and CONSULTANT.

NOW, THEREFORE, in consideration of the mutual obligations, representations, and promises contained in this AGREEMENT, the Parties hereby agree as follows:

1. SCOPE OF WORK

CONSULTANT agrees to furnish all professional services and equipment necessary to accomplish those Project elements outlined in the Scope of Work attached hereto as "Attachment A", and by this reference made a part of this AGREEMENT.

- A. The CONSULTANT shall be responsible for the professional quality, technical accuracy, and completeness and coordination of the work and services furnished by the CONSULTANT under this AGREEMENT, including the work performed by its Subconsultants. Where approval by the SANITATION DISTRICT is required, it is understood that any such approval shall operate as conceptual approval only and shall not relieve the CONSULTANT of responsibility for complying with all applicable laws, regulations, codes, or industry standards, and shall not limit or reduce CONSULTANT's liability for any and all damages caused by errors, omissions, noncompliance with industry standards, and/or negligence on the part of the CONSULTANT or its Subconsultants to the extent indicated herein.
- B. CONSULTANT is solely responsible for the quality of work prepared under this AGREEMENT and shall ensure that all work is performed to the highest industry standards for clarity, uniformity, and completeness. CONSULTANT shall timely respond to all comments, suggestions, and recommendations from the SANITATION DISTRICT. All comments from the SANITATION DISTRICT, or its agent, shall be incorporated into the work prior to the next review deadline or addressed, in writing, as to why the comment(s)

has/have not been incorporated. CONSULTANT shall ensure that each submittal is 100% accurate for the level of work submitted (i.e. correct references, terms, capitalization or equal status, spelling, punctuation, etc.).

- C. In the event that CONSULTANT's services and/or work product(s) is not to the satisfaction of the SANITATION DISTRICT and/or does not conform to the requirements of this AGREEMENT or applicable laws, regulations, or industry standards, the CONSULTANT shall, without additional compensation, promptly correct or revise any errors or deficiencies in its work product(s) within the timeframe specified by the Project Manager in accordance with Section 1.E below and any other Warranty provided herein.
- D. Any CAD drawings, figures, and other work produced by CONSULTANT and Subconsultants shall be completed pursuant to the SANITATION DISTRICT CAD Manual. Conversion of CAD work from any other non-standard CAD format to the SANITATION DISTRICT format shall not be acceptable in lieu of this requirement.

Electronic files shall conform to all SANITATION DISTRICT specifications. Any changes to these specifications by the CONSULTANT are subject to review and require advance written approval of the SANITATION DISTRICT.

- E. Submittals, including electronic files, shall be subject to an acceptance review period established in the schedule for the noted milestone and associated submittal. If a submittal is required which is not addressed in the schedule, the SANITATION DISTRICT will provide a response to the submittal provided by CONSULTANT on the required date unless otherwise negotiated with the CONSULTANT. The SANITATION DISTRICT shall perform appropriate reviews to ensure compliance with SANITATION DISTRICT's internal standards and requirements, including CAD Manual compliance. CONSULTANT shall correct any discrepancies or errors detected and reported within the acceptance period at no additional cost to the SANITATION DISTRICT. CONSULTANT's revisions shall be submitted to SANITATION DISTRICT within five (5) calendar days of CONSULTANT's receipt of the SANITATION DISTRICT's revision request, for the second review period of no more than five (5) days. Should there be further requests for revisions by SANITATION DISTRICT or, should SANITATION DISTRICT take more than the five (5) days to respond to CONSULTANT, the Project schedule will be adjusted to account for any further delays in order to gain SANITATION DISTRICT's acceptance. The Parties understand and agree that SANITATION DISTRICT shall have no responsibility to review submittals for compliance with any applicable laws, regulations, or industry standards, and further agree that nothing in this AGREEMENT shall limit CONSULTANT's responsibility to ensure that all submittals or other work product conform with all applicable laws, regulations, and industry standards.
- F. The Parties understand that the provision of consulting services under this AGREEMENT may require CONSULTANT and SANITATION DISTRICT to provide certain Confidential Information to the other Party. Confidential Information includes, without limitation, any information, design, process, procedure, formula, data, concept, or know how, regardless of form or means of conveyance, that is: (i) valuable and secret in the sense that its confidentiality affords the disclosing party a competitive advantage over its competitors; (ii) confidential or proprietary, whether or not patentable or copyrightable; or (iii) related to a Party or its business operations, financials, performance results, product planning, marketing strategies, pricing, customers, prospects, suppliers, products, computers, software and any related information. Confidential Information shall not include any information, design, process, procedure, formula, data, concept, or know how that: (i) is known to the receiving Party prior to disclosure by the disclosing Party, (ii) is independently developed by a Party without use of any Confidential Information, (iii) is or becomes lawfully available to the receiving Party on a non-confidential basis from a

source other than the disclosing Party, or (iv) that the disclosing Party authorizes for release in writing. The receiving Party shall use Confidential Information solely in connection with discussions with the disclosing Party and any resulting business transactions between the Parties, provided such use does not violate the terms of this AGREEMENT. The receiving Party shall not use, share, or exploit Confidential Information for the Party's own benefit or that of any third party and shall only use Confidential Information as contemplated by this Agreement or as otherwise specifically authorized in writing by the disclosing Party. The receiving Party shall not make any more copies of Confidential Information than are necessary for its use pursuant to this Agreement. Except as may be required by law or otherwise permitted herein, the receiving Party shall not disclose to any third party any of the Confidential Information of the disclosing Party, or the fact that discussions between the parties are taking place or any of the terms, conditions or other facts with respect thereto, including the status thereof, without the prior written consent of the disclosing Party. The Parties may disclose Confidential Information to officers, directors, employees, service providers, consultants, subcontractors, agents and attorneys (collectively, "Representatives") with a need to know the Confidential Information in order to complete the services contemplated in this AGREEMENT, provided the receiving Party binds those Representatives to terms at least as restrictive as those in this Agreement. The Parties agree to take commercially reasonable efforts to prevent the improper disclosure or dissemination of Confidential Information and shall be responsible for any breach of this Agreement by any person to whom the receiving Party discloses any Confidential Information. In the event that either Party is required by law, governmental authority, or judicial order, according to advice of counsel, to disclose any Confidential Information covered by this Agreement, the Party being compelled to disclose shall provide the other Party with prompt notice of such pending disclosure so that the other party may seek a protective order, if appropriate. The receiving Party shall use at least the same degree of care (and, in any event, not less than a reasonable degree of care) in protecting the disclosing Party's Confidential Information as it exercises in protecting its own similar Confidential Information. The receiving Party shall notify the disclosing Party immediately upon discovery of any unauthorized use or disclosure of Confidential Information, or any other breach of this Agreement, and shall cooperate in every reasonable way with the disclosing Party to help regain possession of Confidential Information and prevent its further unauthorized use and/or disclosure. The Parties acknowledge that irreparable harm may result from use or disclosure of Confidential Information in violation of this AGREEMENT and agree that, in the event of breach or threatened breach of this AGREEMENT by either Party, the other party shall have remedy in law and/or equity, including without limitation appropriate injunctive relief or specific performance, as may be granted by a court of competent jurisdiction. The termination, expiration, or completion of the consulting relationship established under this AGREEMENT shall not relieve the Parties or their Representatives of their obligations under this provision, including the obligation to prevent improper disclosure, use, or dissemination of Confidential Information.

2. COMPENSATION

Total fixed-price compensation shall be paid to CONSULTANT for services completed in accordance with the scope of work detailed in Attachment A- SCOPE OF WORK in the amount of One Million, Two Hundred Ninety-Six Thousand, Eight Hundred Seventy-Eight Dollars (\$1,296,878.00). Total compensation is inclusive of all taxes required to be paid by the CONSULTANT.

3. PROGRESS AND OTHER REPORTS

- A. Progress Reports. CONSULTANT will submit a progress report with each invoice reflecting the amount of funds expended in labor and/or in other Project costs for the invoice submitted and in total for the Project by milestone. The progress reports shall summarize the stage of

completion the Project as a whole, address any concerns or delays which may be foreseen, and identify potential items which may require a change order which are not included in the Final Scope of Work attached herein.

4. PAYMENT

- A. Upon completion of any Project milestone, CONSULTANT shall submit invoices, hereinafter referred to as "Milestone Invoices," to the SANITATION DISTRICT. All Milestone Invoices shall include a Progress Report as specified in Section 3. CONSULTANT shall warrant and certify the accuracy of the amounts invoiced for each fixed price milestone. CONSULTANT understands that submitted prices are subject to Section 11 Audit Provisions.
- B. CONSULTANT will submit Milestone Invoices covering milestones tasks performed for payment no later than the second Wednesday of the following month after completion of the milestone and in the format required by the SANITATION DISTRICT. The format must include, at a minimum:
 - (a) current milestone being invoiced and the dollar amount
 - (b) current total Project percent invoiced to date and the dollar amount
 - (c) remaining total Project percent to be invoiced and the dollar amount

Upon approval of such payment request by the SANITATION DISTRICT, payment shall be made to CONSULTANT net thirty (30) days of the date of CONSULTANT's invoice for one hundred percent (100%) of the invoiced amount.

- C. Upon satisfactory completion of the Scope of Work performed hereunder and prior to final payment under this AGREEMENT for such Scope of Work, or upon prior settlement following termination of this AGREEMENT, and as a condition precedent thereto, CONSULTANT shall execute and deliver to the SANITATION DISTRICT a release of all claims against the SANITATION DISTRICT arising under or by virtue of this AGREEMENT other than such claims, if any, as may be specifically exempted by CONSULTANT from the operation of the release in stated amounts to be set forth therein.
- D. Pursuant to the California False Claims Act (Government Code sections 12650-12655), any CONSULTANT that knowingly submits a false claim to the SANITATION DISTRICT for compensation under the terms of this AGREEMENT may be held liable for treble damages and up to a \$10,000 civil penalty for each false claim submitted. This section shall also be binding on all Subconsultants.

A CONSULTANT or Subconsultant shall be deemed to have submitted a false claim when the CONSULTANT or Subconsultant:

- (a) knowingly presents or causes to be presented to an officer or employee of the SANITATION DISTRICT a false claim or request for payment or approval;
- (b) knowingly makes, uses, or causes to be made or used a false record or statement to get a false claim paid or approved by the SANITATION DISTRICT;
- (c) conspires to defraud the SANITATION DISTRICT by getting a false claim allowed or paid by the SANITATION DISTRICT;
- (d) knowingly makes, uses, or causes to be made or used a false record or statement to conceal, avoid, or decrease an obligation to the SANITATION DISTRICT; or
- (e) is the beneficiary of an inadvertent submission of a false claim to the SANITATION DISTRICT and fails to disclose the false claim to the SANITATION DISTRICT within a reasonable time after discovery of the false claim.

5. SANITATION DISTRICT's working hours are 6:30 am to 4:30 am. A workday is ten (10) working hours. If CONSULTANT requires overtime wherein, overtime pay will be required, CONSULTANT will request and receive written approval from SANITATION DISTRICT's to work the requested amount of overtime hours at 1.5 times the rate of the CONSULTANT employee's daily per diem rate for the amount of overtime approved.

6. PREVAILING WAGES

A. To the extent CONSULTANT intends to utilize employees or Subconsultants who will perform public works during the Agreement, as more specifically defined under Labor Code Section 1720, CONSULTANT shall be subject to, and shall comply with, all prevailing wage requirements with respect to such employees, and will ensure that all Subconsultants comply with all applicable prevailing wage requirements.

7. CALIFORNIA DEPARTMENT OF INDUSTRIAL RELATIONS (DIR) REGISTRATION AND RECORD OF WAGES

A. To the extent CONSULTANT's employees and/or Subconsultants who will perform Work during the design and preconstruction phases of a construction contract for which Prevailing Wage Determinations have been issued by the DIR and as more specifically defined under Labor Code Section 1720 et seq., CONSULTANT and Subconsultants shall comply with the registration requirements of Labor Code Section 1725.5. Pursuant to Labor Code Section 1771.4, the Work is subject to compliance monitoring and enforcement by the DIR.

B. The CONSULTANT and Subconsultants shall maintain accurate payroll records and shall at all times comply with all applicable provisions of the Labor Code, including Labor Code Section 1776, and shall submit payroll records to the Labor Commissioner pursuant to Labor Code Section 1771.4(a)(3). Penalties for non-compliance with the requirements of Section 1776 may be deducted from progress payments per Section 1776.

C. Pursuant to Labor Code Section 1776, the CONSULTANT and Subconsultants shall furnish a copy of all certified payroll records to the SANITATION DISTRICT and/or members of the general public upon request, provided the public request is made through SANITATION DISTRICT, the Division of Apprenticeship Standards or the Division of Labor Enforcement of the Department of Industrial Relations.

D. The CONSULTANT and Subconsultants shall comply with the job site notices posting requirements established by the Labor Commissioner, including those described in Title 8, California Code of Regulation Section 16461(3).

8. INTELLECTUAL PROPERTY.

A. CONSULTANT retains all intellectual property rights to anything created, owned, conceived, reduced to practice, or fixed in a tangible medium by CONSULTANT before the Project or outside of the scope of the Project and any improvement based solely thereon ("CONSULTANT Background Technology").

B. SANITATION DISTRICT will own all intellectual property rights to improvements which are made (fixed in a tangible medium of expression or conceived and reduced to practice) and delivered to SANITATION DISTRICT under the Project, subject to CONSULTANT ownership of CONSULTANT Background Technology.

- C. Subject to CONSULTANT's ownership of CONSULTANT BACKGROUND TECHNOLOGY, SANITATION DISTRICT will retain sole ownership of any and all Work Product provided by the CONSULTANT under this AGREEMENT. Work Product includes, but is not limited to, all drafts, data, correspondence, proposals, and reports (collectively, "Work Product") compiled, composed, or created by CONSULTANT under this AGREEMENT.
- D. CONSULTANT grants SANITATION DISTRICT a perpetual, worldwide, non-exclusive, non-transferrable, personal, revocable, limited license to use and modify CONSULTANT Background Technology that are integrated into the Project only for the purpose of operation, repair, modification, extension, and maintenance of the Project. SANITATION DISTRICT agrees to indemnify, defend and hold harmless CONSULTANT and all related parties from and against any changes made by SANITATION DISTRICT or others relating to design documents produced by CONSULTANT.

9. INSURANCE

A. General

- i. Insurance shall be issued and underwritten by insurance companies acceptable to the SANITATION DISTRICT.
- ii. Insurers must have an "A-" Policyholder's Rating, or better, and Financial Rating of at least Class VIII, or better, in accordance with the most current A.M. Best's Guide Rating. However, the SANITATION DISTRICT will accept State Compensation Insurance Fund, for the required policy of Worker's Compensation Insurance subject to the SANITATION DISTRICT's option to require a change in insurer in the event the State Fund financial rating is decreased below "B". Further, the SANITATION DISTRICT will require CONSULTANT to substitute any insurer whose rating drops below the levels herein specified. Said substitution shall occur within twenty (20) days of written notice to CONSULTANT, by the SANITATION DISTRICT or its agent.
- iii. Coverage shall be in effect prior to the commencement of any work under this AGREEMENT.

B. General Liability

The CONSULTANT shall maintain during the life of this AGREEMENT, Commercial General Liability Insurance written on an occurrence basis providing the following minimum limits of liability coverage: Two Million Dollars (\$2,000,000) per occurrence with Four Million Dollars (\$4,000,000) annual aggregate. Said insurance shall include coverage for the following hazards: Premises-Ongoing Operations, contractual liability, products liability/completed operations (including any product manufactured or assembled), broad form property damage, independent contractor liability, personal and advertising injury. A statement on an insurance certificate will not be accepted in lieu of the actual additional insured endorsement(s). If requested by SANITATION DISTRICT and applicable, XCU coverage (Explosion, Collapse and Underground) and Riggers/On Hook Liability must be included in the General Liability policy and coverage must be reflected on the submitted Certificate of Insurance.

C. Umbrella Excess Liability

The minimum limits of general liability and Automotive Liability Insurance required, as set forth herein, shall be provided for through either a single policy of primary insurance or a combination of policies of primary and umbrella excess coverage. Umbrella excess liability coverage shall be issued with limits of liability which, when combined with the primary insurance, will equal the minimum limits for general liability and automotive liability.

D. Automotive/Vehicle liability Insurance

The CONSULTANT shall maintain a policy of Automotive Liability Insurance on a comprehensive form covering all owned, non-owned, and hired automobiles, trucks, and other vehicles providing the following minimum limits of liability coverage: Combined single limit of One Million Dollars (\$1,000,000) per person for bodily injury and One Million Dollars (\$1,000,000) per accident for property damage. A statement on an insurance certificate will not be accepted in lieu of the actual additional insured endorsement.

E. Drone Liability Insurance

If a drone will be used, drone liability insurance must be maintained by CONSULTANT in the amount of one million dollars (\$1,000,000) in form acceptable to the SANITATION DISTRICT.

F. Worker's Compensation Insurance

The CONSULTANT shall provide such Workers' Compensation Insurance as required by the Labor Code of the State of California in the amount of the statutory limit, including Employer's Liability Insurance with a minimum limit of One Million (\$1,000,000) per occurrence. Such Worker's Compensation Insurance shall be endorsed to provide for a waiver of subrogation in favor of the SANITATION DISTRICT. A statement on an insurance certificate will not be accepted in lieu of the actual endorsements unless the insurance carrier is State of California Insurance Fund and the identifier "SCIF" and endorsement numbers 2570 and 2065 are referenced on the certificate of insurance. If an exposure to Jones Act liability may exist, the insurance required herein shall include coverage for Jones Act claims.

G. Errors and Omissions/Professional Liability

CONSULTANT shall maintain in full force and effect, throughout the term of this AGREEMENT, standard industry form professional negligence errors and omissions insurance coverage in an amount of not less than Five Million Dollars (\$5,000,000) with limits in accordance with the provisions of this Paragraph.

If the policy of insurance is written on a "claims made" basis, said policy shall be continued in full force and effect at all times during the term of this AGREEMENT, and for a period of three (3) years from the date of the completion of the services hereunder.

In the event of termination of said policy during this period, CONSULTANT shall obtain continuing insurance coverage for the prior acts or omissions of CONSULTANT during the course of performing services under the term of this AGREEMENT. Said coverage shall be evidenced by either a new policy evidencing no gap in coverage or by separate extended "tail" coverage with the present or new carrier.

In the event the present policy of insurance is written on an “occurrence” basis, said policy shall be continued in full force and effect during the term of this AGREEMENT or until completion of the services provided for in this AGREEMENT, whichever is later. In the event of termination of said policy during this period, new coverage shall be obtained for the required period to insure for the prior acts of CONSULTANT during the course of performing services under the term of this AGREEMENT.

CONSULTANT shall provide to the SANITATION DISTRICT a certificate of insurance in a form acceptable to the SANITATION DISTRICT indicating the expiration date of said policy and shall provide renewal certificates not less than ten (10) days prior to the expiration of each policy term.

H. Proof of Coverage

The CONSULTANT shall furnish the SANITATION DISTRICT with original certificates and amendatory endorsements effecting coverage. Said policies and endorsements shall conform to the requirements herein stated. All certificates and endorsements are to be received and approved by the SANITATION DISTRICT before work commences. In such case of a claim, the SANITATION DISTRICT reserves the right to require complete, certified copies of the applicable insurance policies, including endorsements, effecting the coverage required. The following are approved forms that must be submitted as proof of coverage:

Certificate of Insurance	ACORD Form 25 (5/2010) or equivalent
Additional Insurance (General Liability)	(ISO Form) CG 2001 10 01 or CG 2010 04 13. All other Additional Insured endorsements must be submitted for approval by the SANITATION DISTRICT, and the SANITATION DISTRICT may reject alternatives that provide different or less coverage to the SANITATION DISTRICT.
Additional Insured (Auto Liability)	Submit endorsement provided by carrier for the SANITATION DISTRICT approval.
Waiver of Subrogation	State Compensation Insurance Fund Endorsement No. 2570 or equivalent
Cancellation Notice	State Compensation Insurance Fund Endorsement No. 2065 or equivalent

I. Cancellation Notice

Each insurance policy required herein shall be endorsed to state that coverage shall not be cancelled by either Party, except after thirty (30) days’ prior written notice. The Cancellation Section of ACORD Form 25 (5/2010) shall state the required thirty (30) days’ written notification. The policy shall not terminate, nor shall it be cancelled, nor the coverage reduced until thirty (30) days after written notice is given to the SANITATION DISTRICT except for nonpayment of premium, which shall require not less than ten (10) days written notice to the SANITATION DISTRICT. Should there be changes in coverage, the CONSULTANT and its insurance broker/agent shall send to the SANITATION DISTRICT a certified letter which includes a description of the changes in coverage. The certified letter must be sent to the attention of Risk Management, Div. 260, and shall be received by the SANITATION DISTRICT not less than thirty (30) days prior to the effective date of the change(s) if the change would reduce coverage or otherwise reduce or limit the scope of insurance coverage provided to the SANITATION DISTRICT.

J. Primary Insurance

All liability policies shall contain a Primary and Non-Contributory Clause. Any other insurance maintained by the SANITATION DISTRICT shall be excess and not contributing with the insurance provided by CONSULTANT.

K. Non-Limiting (if applicable)

Nothing in this document shall be construed to limit the indemnification provision contained in this AGREEMENT, or the extent to which CONSULTANT may be held responsible for payment of damages to persons or property pursuant to this Agreement.

L. Deductibles and Self-Insured Retentions

Any deductible and/or self-insured retention will be the responsibility of CONSULTANT. The SANITATION DISTRICT will not be required to pay any deductibles and/or self-insured retention with regard to any claims filed on CONSULTANT's policies.

M. Subconsultants

The CONSULTANT shall be responsible to establish insurance requirements for any Subconsultant hired by the CONSULTANT. The insurance shall be in amounts and types reasonably sufficient to deal with the risk of loss involving the Subconsultant's operations and work.

10. SCOPE CHANGES

In the event of a change in the Scope of Work or a change in the proposed Project, as requested by the SANITATION DISTRICT, the Parties hereto shall execute an Amendment to this AGREEMENT setting forth with particularity any additional terms of the Amendment, changes required to the terms of the AGREEMENT, but not limited to any additional CONSULTANT's fees. Additional on-site work required by SANITATION DISTRICT after completion of the project will be proposed at the rates noted below:

Table 1 Per Diem Rate Table (U.S.)

Item	Description	Price (USD)
1	Mobilization fee per U.S. personnel	Distant (requires air travel) = \$3,800 Local (within 200 miles) = \$1,800
2	Daily rate per U.S. personnel	Weekday rate = \$2,400/day Saturday rate = \$3,100/day Sunday and holiday rate = \$4,000/day

Table 1 Per Diem Rate Table (U.S.)

If SANITATION DISTRICT requests or requires additional days with the RTDS beyond five-day RTDS allocation provided in the initial scope of work, the RTDS rate for such additional days is \$4,000 per day. Additional RTDS days due to CONSULTANT'S delay in the attached Scope of Work will not be billed to SANITATION DISTRICT.

11. PROJECT TEAM AND SUBCONSULTANTS

Prior to the execution of this Agreement, CONSULTANT shall provide to SANITATION DISTRICT, and the SANITATION DISTRICT shall approve, a list containing the names and full description of all Subcontractors/Subconsultants and CONSULTANT's Project team members anticipated to be used on this Project under this AGREEMENT by CONSULTANT. CONSULTANT shall include a description of the work and services to be done by each Subcontractor/Subconsultant and each of CONSULTANT's Project team member. CONSULTANT shall include the respective compensation amounts for CONSULTANT and each Subcontractor/Subconsultant, broken down as indicated in Section 2- COMPENSATION. SANITATION DISTRICT must approve CONSULTANT's list of Subcontractors, Subconsultants, and Project team members prior to the initiation of any work under this AGREEMENT. SANITATION DISTRICT retains the right to prevent CONSULTANT from using certain Subcontractors, Subconsultants, or Project team members if SANITATION DISTRICT reasonably believes such Subcontractors, Subconsultants, or Project team members are unqualified or unfit.

There shall be no substitution of the listed Subcontractors/Subconsultants without prior written approval by the SANITATION DISTRICT.

12. ENGINEERING REGISTRATION

The CONSULTANT's personnel and Subconsultants are comprised of registered engineers and a staff of specialists and draftsmen in each department. The firm itself is not a registered engineer but represents and agrees that wherever, in the performance of this AGREEMENT, the services of a registered engineer are required, such services will be performed by, or under the direct supervision of, registered engineers who are registered in California.

13. AUDIT PROVISIONS.

- A. SANITATION DISTRICT retains the reasonable right to access, review, examine, and audit applicable records, documents and any other evidence of procedures and practices that are reasonably related to the CONSULTANT's work under this AGREEMENT and which may be necessary to discover and verify that the CONSULTANT is in compliance with all requirements under this AGREEMENT. The CONSULTANT shall include the SANITATION DISTRICT's right as described above in any and all of their subcontracts and shall ensure that these rights are binding upon all Subcontractors/Subconsultants during the term of this AGREEMENT and for a period of three (3) years after its termination.
- B. CONSULTANT shall maintain complete and accurate records in accordance with generally accepted industry standard practices. The CONSULTANT shall make available to the SANITATION DISTRICT for review and audit, all Project related accounting records and documents for the type of work provided within 15 days after receipt of notice from the SANITATION DISTRICT. If an audit is performed, CONSULTANT shall ensure that a qualified employee of the CONSULTANT will be available to assist SANITATION DISTRICT's auditor in obtaining all Project related accounting records and documents.
- C. It is understood that CONSULTANT will not release the make-up of its labor rates nor product prices nor the formulas or processes used to determine such rates and prices.

14. LEGAL RELATIONSHIP BETWEEN PARTIES

The legal relationship between the parties hereto is that of an independent contractor and nothing herein shall be deemed to transform CONSULTANT, its staff, independent contractors, or Subconsultants into employees of the SANITATION DISTRICT. CONSULTANT's staff performing services under the AGREEMENT shall at all times be employees and/or independent contractors of CONSULTANT. CONSULTANT shall monitor and control its staff and pay wages, salaries, and other amounts due directly to its staff in connection with the AGREEMENT. CONSULTANT shall be responsible for hiring, review, and termination of its staff and shall be accountable for all reports and obligations respecting them, such as social security, income tax withholding, unemployment compensation, workers' compensation and similar matters.

15. NOTICES

All notices hereunder and communications regarding the interpretation of the terms of this AGREEMENT, or changes thereto, shall be affected by delivery of said notices in person or by depositing said notices in the U.S. mail, registered or certified mail, return receipt requested, postage prepaid and addressed as follows:

SANITATION DISTRICT:

Orange County Sanitation District
10844 Ellis Avenue
Fountain Valley, CA 92708-7018
Attention: Clarice Marcin, Senior Contracts Administrator
Copy: Todd Waltz, CIP Project Manager

CONSULTANT:

SEL ENGINEERING SERVICES, INC.
Dita Wexler, Contracts and Risk Manager
2350 NE Hopkins Court
Pullman, WA 99163
Phone: 509-332-1890
FAX: 509-332-7990
Email: selcontracts@selinc.com

All communication regarding the Scope of Work will be addressed to the Project Manager identified above. Direction from other SANITATION DISTRICT staff must be approved in writing by the SANITATION DISTRICT's Project Manager prior to action from the CONSULTANT.

16. TERMINATION

The SANITATION DISTRICT may terminate this AGREEMENT at any time, without cause, after giving thirty (30) days written notice to CONSULTANT. In the event of such termination, CONSULTANT shall be entitled to compensation for work performed on a prorated basis through and including the effective date of termination and any non-cancellable obligations incurred for the Project.

CONSULTANT shall be permitted to terminate this AGREEMENT upon thirty (30) days written notice only if CONSULTANT is not compensated for billed amounts in accordance with the provisions of this AGREEMENT, when the same are due.

Notice of termination shall be mailed to the SANITATION DISTRICT at the address listed in Paragraph 14 - NOTICES.

17. DOCUMENTS AND STUDY MATERIALS

The documents and study materials for this Project which have been paid for but not yet delivered by CONSULTANT shall become the property of the SANITATION DISTRICT upon the termination or completion of the work in accordance with Section 7 herein.

18. COMPLIANCE

CONSULTANT certifies by the execution of this AGREEMENT that it pays employees not less than the minimum wage as defined by law, and that it does not discriminate in its employment with regard to race, color, religion, sex or national origin; that it is in compliance with all federal, state and local directives and executive orders regarding non-discrimination in employment; and that it agrees to demonstrate positively and aggressively the principle of equal opportunity in employment.

19. AGREEMENT EXECUTION AUTHORIZATION

Both the SANITATION DISTRICT and CONSULTANT do covenant that each individual executing this document by and on behalf of each Party is a person duly authorized to execute this AGREEMENT for that Party.

20. DISPUTE RESOLUTION

In the event of a dispute arising between the parties regarding performance or interpretation of this AGREEMENT, the dispute shall be resolved by binding arbitration under the auspices of the Judicial Arbitration and Mediation Service ("JAMS"), or similar organization or entity conducting alternate dispute resolution services and approved by both Parties.

21. ATTORNEY'S FEES, COSTS AND NECESSARY DISBURSEMENTS

If any action at law or in equity or if any proceeding in the form of an Alternative Dispute Resolution (ADR) or arbitration is necessary to enforce or interpret the terms of this AGREEMENT, the prevailing party shall be entitled to reasonable attorney's fees, costs and necessary disbursements in addition to any other relief to which he may be entitled.

22. WARRANTY

CONSULTANT warrants to SANITATION DISTRICT that CONSULTANT-manufactured products or equipment ["Product(s)"] are free from defects in material and workmanship for ten (10) years after delivery to SANITATION DISTRICT for all CONSULTANT Products, including CONSULTANT-manufactured control enclosure structures and panels. The sole and exclusive warranties for any software are set forth in the CONSULTANT Software License Agreement. The warranty described herein is conditioned upon proper storage of Products and shall be void in its entirety if SANITATION DISTRICT modifies Products without prior written consent to, and subsequent approval of, any such modifications by CONSULTANT, or if SANITATION DISTRICT uses Products for any applications that require product listing or qualification not specifically included in the CONSULTANT written quotation or proposal. If any Product fails to conform to this warranty and SANITATION DISTRICT properly notifies CONSULTANT of such failure and returns the Product to CONSULTANT's factory for diagnosis (and pays all expenses for such return), CONSULTANT shall correct any such failure by, at its sole discretion, either repairing any defective or damaged Product part(s) or making available any necessary replacement part(s) or Product(s). CONSULTANT will pay the freight to return the Product to the SANITATION DISTRICT (Carriage Paid to (CPT) customer's place of business). If CONSULTANT is unable or unwilling to repair or replace, CONSULTANT and SANITATION DISTRICT shall negotiate an equitable resolution such as a prorated refund or credit to the SANITATION DISTRICT's account. Any Product repair or upgrade shall be covered by this warranty for the longer of one (1) year from date of repair or the remainder

of the original warranty period. TO THE MAXIMUM EXTENT PERMITTED BY LAW, THIS WARRANTY SHALL BE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER STATUTORY, EXPRESS OR IMPLIED (INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE AND WARRANTIES ARISING FROM COURSE OF PERFORMANCE OR DEALING OR USAGE OF TRADE), EXCEPT WARRANTY OF TITLE AND AGAINST PATENT INFRINGEMENT. CONSULTANT shall, whenever possible, pass the original manufacturer warranty to SANITATION DISTRICT for non-CONSULTANT products and/or services. CONSULTANT does not warrant non-CONSULTANT products and/or services, including non-CONSULTANT control enclosure structures, and non-CONSULTANT products within CONSULTANT panels, control enclosure structures and systems, and products or prototypes provided by CONSULTANT for testing, marketing, or loan purposes.

CONSULTANT shall perform its services in accordance with generally accepted industry and professional standards and in a manner consistent with the degree of care and skill ordinarily exercised by members of the same profession currently practicing under similar circumstances. If, within the 12-month period following completion of CONSULTANT's services under this AGREEMENT, the SANITATION DISTRICT informs CONSULTANT that any part of the services fails to meet those standards, CONSULTANT shall reperform (or, at CONSULTANT's option and subject to SANITATION DISTRICT approval, pay a third party to reperform) any of its defective services (including services performed in conjunction with CONSULTANT systems) at no cost to SANITATION DISTRICT upon receipt of such notice detailing the defective service(s). CONSULTANT shall, within a reasonable time prescribed by the SANITATION DISTRICT, take all such actions as are necessary to correct or complete the noted deficiency(ies).

23. INDEMNIFICATION

To the fullest extent permitted by law and subject to the provisions of California Civil Code Section 2782.8, CONSULTANT shall indemnify, defend (at CONSULTANT's sole cost and expense and with legal counsel approved by the SANITATION DISTRICT, which approval shall not be unreasonably withheld), protect and hold harmless the SANITATION DISTRICT and all of SANITATION DISTRICT's officers, directors, employees, and agents (collectively the "Indemnified Parties"), from and against any and all claims, damages, liabilities, causes of action, suits, losses, judgments, fines, penalties, costs and expenses (including reasonable attorneys' fees, disbursements and court costs; individually, a "Claim"; collectively, "Claims") which may arise from, or are in any manner related to, work, operations, activities, or services performed by, or under the supervision of, CONSULTANT pursuant to this AGREEMENT. Such Claims include, but are not limited to, any negligent acts or omissions, recklessness and/or willful or intentional misconduct of CONSULTANT or CONSULTANT's principals, officers, agents, employees, suppliers, Subconsultants, subcontractors, and/or any person or entity employed directly or indirectly by any such party

Notwithstanding the foregoing, nothing herein shall be construed to require CONSULTANT to indemnify the Indemnified Parties from any Claim or any portion thereof arising from:

- (a) the negligence or willful misconduct of the Indemnified Parties as determined in a final judgment, arbitration, award, order, settlement, or other final resolution of the matter; or
- (b) a natural disaster or other act of God, such as an earthquake; or
- (c) the action(s) of an independent third party who is wholly unrelated to the Indemnified Parties, the CONSULTANT, and CONSULTANT's principals, officers, agents, employees, suppliers, Subconsultants, and subcontractors, including any person or entity employed directly or indirectly by any of the aforementioned parties.

Exceptions (a) through (c) above shall not apply, and CONSULTANT shall, to the fullest extent permitted by law, indemnify, defend, protect, and hold harmless the Indemnified Parties, from Claims arising from more than one cause if any such cause due to Contractor's negligence taken alone would otherwise result in the obligation to indemnify hereunder.

To the extent permitted by law, CONSULTANT's liability for indemnification hereunder is in addition to any liability CONSULTANT may have to the SANITATION DISTRICT for a breach by CONSULTANT of any of the provisions of this AGREEMENT to the extent allowed herein. In no event, whether as a result of breach of contract, indemnity, warranty, tort (including negligence), strict liability or otherwise, shall either Party be liable to the other Party or their insurers for any loss or damage which is not covered by the negligent Party's insurance, for an amount exceeding five million dollars (\$5,000,000) and any liability shall terminate upon the expiration of the warranty period or the statute of limitations whichever is shorter. No claim, regardless of form, arising under this AGREEMENT may be brought by a Party outside of the applicable California statute of limitations. In no event, whether as a result of breach of contract, indemnity, warranty, tort (including negligence), strict liability or otherwise, shall either Party be liable for any special, consequential, incidental, liquidated or punitive damages, including without limitation any loss of profit or revenues, loss of use of products or associated equipment, damage to associated equipment, cost of capital, cost of substitute products, facilities, services or replacement power, downtime costs or claims of either Party's customers for such damages. The terms of this AGREEMENT are contractual and the result of negotiation between the parties hereto. Accordingly, rule of construction of contracts (including, without limitation, California Civil Code Section 1654) that ambiguities are to be construed against the drafting party, shall not be employed in the interpretation of this AGREEMENT.

24. DUTY TO DEFEND

CONSULTANT's duty to defend the Indemnified Parties from a Claim brought hereunder subject to California Civil Code section 2782.8. Such defense obligation shall arise immediately upon presentation of a Claim by any person if such Claim could potentially result in an obligation to indemnify one or more Indemnified Parties, and upon written notice of such Claim being provided to CONSULTANT. Payment to CONSULTANT by any Indemnified Party or the payment or advance of defense costs by any Indemnified Party shall not be a condition precedent to enforcing such Indemnified Party's rights to indemnification hereunder. In the event a final judgment, arbitration, award, order, settlement, or other final resolution expressly determines that the claim did not arise out of, pertain to, or relate, in whole or in part, to the negligence, recklessness, or willful misconduct of the CONSULTANT, then the SANITATION DISTRICT will reimburse CONSULTANT for the reasonable costs of defending the Indemnified Parties against such claims for the portion and extent of the SANITATION DISTRICT's adjudicated negligence, recklessness, or willful misconduct. In no event shall the costs to defend the Indemnified Party charged to the Consultant exceed the Consultant's proportionate percentage of fault.

CONSULTANT'S indemnification obligation hereunder shall survive the expiration or earlier termination of this AGREEMENT until such time as action against the Indemnified Parties for such matter is fully and finally barred by the applicable statute of limitations.

25. COMPLIANCE WITH SANITATION DISTRICT POLICIES AND PROCEDURES

CONSULTANT shall be required to comply with all SANITATION DISTRICT policies and procedures, including the OCSD Safety Standards, as applicable, as may be amended from time to time.

26. CLOSEOUT

When the SANITATION DISTRICT determines that all work authorized under the AGREEMENT is fully complete and that the SANITATION DISTRICT requires no further work from CONSULTANT, or the AGREEMENT is otherwise terminated or expires in accordance with the terms of the AGREEMENT, the SANITATION DISTRICT shall give the CONSULTANT written notice that the

AGREEMENT will be closed out. CONSULTANT shall submit all outstanding billings, work submittals, deliverables, reports or similarly related documents as required under the AGREEMENT within thirty (30) days of receipt of notice of AGREEMENT closeout.

Upon receipt of CONSULTANT'S submittals, the SANITATION DISTRICT shall commence a closeout audit of the AGREEMENT and will either:

- i. Give the CONSULTANT a final AGREEMENT Acceptance; or
- ii. Advise the CONSULTANT in writing of any outstanding item or items which must be furnished, completed, or corrected at the CONSULTANT's cost unless such costs were approved for expenditure by the SANITATION DISTRICT.

CONSULTANT shall be required to provide adequate resources to fully support any administrative closeout efforts identified in the AGREEMENT. Such support must be provided within the timeframe requested by the SANITATION DISTRICT.

Notwithstanding the final AGREEMENT acceptance, the CONSULTANT will not be relieved of its obligations hereunder, nor will the CONSULTANT be relieved of its obligations to complete any portions of the work, the non-completion of which were not disclosed to the SANITATION DISTRICT (regardless of whether such nondisclosures were fraudulent, negligent, or otherwise), and the CONSULTANT shall remain obligated under all applicable provisions of the AGREEMENT which expressly or by their nature extend beyond and survive final AGREEMENT Acceptance.

Any failure by the SANITATION DISTRICT to reject the work or to reject the CONSULTANT's request for final AGREEMENT Acceptance as set forth above shall not be deemed to be acceptance of the work by the SANITATION DISTRICT for any purpose nor imply acceptance of, or agreement with, the CONSULTANT's request for final AGREEMENT Acceptance.

- 27.** When the CONSULTANT will WORK on SANITATION DISTRICT sites, the OCSD's Safety Standard will be complied with by CONSULTANT employees. CONSULTANT engineers will bring hard hat, safety-toe protective footwear, safety glasses, ear plugs, and cotton or fire-rated shirt. SANITATION DISTRICT will provide any other special clothing or safety equipment required to enter site. Also, SANITATION DISTRICT will provide any special safety training to enter site (training time shall apply to onsite support time).

28. ENTIRE AGREEMENT

This AGREEMENT constitutes the entire understanding and AGREEMENT between the Parties and supersedes all previous negotiations between them pertaining to the subject matter thereof. This Agreement may be modified or amended only by a written document executed by the Parties and by persons with authority to execute the same.

29. WORK SUSPENSION

De-mobilization and re-mobilization which is written into the Project schedule is not considered Work Suspensions under this article. Work Suspensions herein are defined as those suspensions which are not planned and therefore are not expected and would require additional funding to cover such costs. Should the Sanitation District require Consultant to suspend progress on the Consultant's work which would require Consultant to shut down the Project until such time the Sanitation District provides notice to Consultant to re-start the Project, or the Sanitation District does not respond within

thirty (30) days to a request for information or other key decision points needed for the Project to remain active and progressing, the Sanitation District agrees to pay Consultant \$10,000 for such situations which would require Consultant to demobilize and re-mobilize the Project for each and every situation.

Upon written notice from the Sanitation District to re-mobilize the Project, Sanitation District will also Provide a revised Project schedule which extends the Project dates by, at least, the same amount of time as the time of the suspension of the Project.

Should Consultant's staff be unavailable to re-start the work due to workload incurred during the Work Suspension, the revised schedule shall also take this into account for extending the dates for reasonable completion periods.

In the event that a Project is shut down or suspended due the reasons noted in this Section, for a period of more than forty-five (45) days, Consultant, will charge the Sanitation District and the Sanitation District agrees to pay. Consultant additional a 20% restocking fee for any material that has been ordered but not delivered or installed which can be returned for credit. If such material is customized and cannot be re-stocked, ~~but~~ the Sanitation District agrees to pay for any for the actual cost for the portion of the customized material that cannot be re-stocked.

IN WITNESS WHEREOF, this AGREEMENT has been executed in the name of the SANITATION DISTRICT, by its officers thereunto duly authorized, and CONSULTANT as of the day and year first above written.

**CONSULTANT: SEL ENGINEERING SERVICES, INC.
and its affiliates**

By _____ Date _____

Printed Name & Title

ORANGE COUNTY SANITATION DISTRICT

By _____ Date _____
David John Shawver
Board Chairman

By _____ Date _____
Kelly A. Lore
Clerk of the Board

By _____ Date _____
Ruth Zintzun
Purchasing & Contracts Manager

Attachments: Attachment "A" – Scope of Work
Attachment "I" – Cost Matrix and Summary Form
Attachment "K" – OCSD Safety Standards

CMM:ms

ATTACHMENT A

SCOPE OF WORK

ELECTRICAL POWER DISTRIBUTION SYSTEM IMPROVEMENTS

PROJECT NO. J-98

PROFESSIONAL SERVICES AGREEMENT

ATTACHMENT A – SCOPE OF WORK

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I. SUMMARY

Orange County Sanitation District (OCSD) is seeking a proposal from Schweitzer Engineering Laboratories Engineering Services, Inc. (SEL ES) for Substation LAN and load-shedding design and programming services. These services shall be provided directly to OCSD under a professional services contract between OCSD and SEL ES. These SEL ES design and programming services will be supplemented by the design services performed by the OCSD designated CONSULTANT. The CONSULTANT's design services will be provided by a separate professional design services contract between OCSD and the CONSULTANT. Procurement of SEL hardware shall be provided under a separate construction contract between the Contractor and SEL during the construction phase of the project. The Contractor or the construction Contractor herein is defined by the Contractor whom will be successfully awarded the construction contract of the work that is designed under this professional services contract. The design services shall include network design, integration, programming, factory demonstration testing, commissioning, training, and closeout of the Load Shed and Substation LAN system.

As part of the separate construction contract between the Contractor and SEL, SEL will furnish to the construction Contractor the hardware (including the development of the associated submittals) for installation by the Contractor. Networking equipment will be procured (with required submittals) in the construction phase in accordance with the specifications issued as part of the professional services contract between OCSD and SEL ES. The construction contract will perform installation only. SEL ES' construction contract price to the Contractor, will include providing the following: equipment, control panel fabrication, construction submittals, equipment service manuals, operations and maintenance training, construction Contractor coordination, installation support, certification of proper installation and operation of the Load Shed and Substation LAN system (equipment directly furnished by SEL to the Contractor), facility site visits to assist in field problem resolution, and clarification/verification to help resolve construction issues as they arise. This approach is similar to the approach taken in the engineering services contract agreement between OCSD and SEL ES for Plant No. 2 on the J-117B project, with some noted differences as stated in this Scope of Work (SOW).

OCSD will furnish and deliver the following equipment and software to SEL ES for configuration after the Functional Design Specification (FDS) is approved:

1. Two servers for the load shedding HMI system
2. Four HMI client applications

SEL ES shall ship all equipment provided by OCSD and the Contractor to OCSD's Plant No. 1 site after all testing has been completed. All shipping fees shall be included in SEL ES's proposal.

Table 1 has been provided to identify the overview of work to be done by others for the Substation LAN to help facilitate integration into the SEL ES design. The OCSD designated CONSULTANT will provide certain engineering services which shall be integrated into the SEL design by SEL ES. SEL ES shall provide timely support for any information and documentation required for the CONSULTANT to complete the CONSULTANT's deliverables, as they relate to the SEL design and hardware.

Table 1 – Overview of Work to be Done by Others for the Substation LAN

Phase	OCSD DESIGNATED CONSULTANT	CONSTRUCTION CONTRACTOR
Design	<ul style="list-style-type: none"> - Front-end Documents Bid Documents - Technical Specifications (except Functional Design Specification and Load Shed & Substation LAN Specification) - Overall Site Plan - Power & Control Plan Drawings - Single Line Drawings - Circuit Breaker Elementary Diagrams - Cable, Conduit, & Tray Schedules - Electrical Ductbank Sections - LAN Relay Connection Details based on the SEL ES Produced Sample Riser Diagrams - Network Panel Wiring Diagrams Based on SEL ES Front-End Engineering Design (FEED) - Fiber Optic Cable Routing Between Buildings Based on SEL ES Produced Topological Network Diagrams - Fiber Cabinet Layout Drawings and BOM based on SEL ES FEED - Power Panel Schedules - P&IDs - Civil and Mechanical Drawings 	<ul style="list-style-type: none"> - None
Construction/ Commissioning /Close-out	<ul style="list-style-type: none"> - As-built Drawings Designed by OCSD Designated CONSULTANT in the Design Phase 	<ul style="list-style-type: none"> - NETA Testing - As-built Switchgear Elevation Drawings - As-built Switchgear Wiring (Interconnect) drawings - As-built 3-line Drawings - Procurement and Installation of Hardware & certain Services per Construction Contract Requirements

II. PROJECT SCHEDULE

The construction/commissioning/close-out services specified in this SOW shall be executed in accordance with the awarded Contractor’s construction contract. SEL ES shall periodically review Contractor’s schedule as needed to confirm that the SEL ES work plan is in alignment with the Contractor’s schedule.

The following table describes major milestones and deadlines. Where Contractor schedule requires stricter deadlines, SEL shall abide by and adhere to those deadlines instead. This would apply to tasks impacting the Contractor, such as installation of the SEL hardware at the project site. Non-milestone tasks (included in this SOW) that are pre-requisite to the milestone tasks shall be scheduled and executed by SEL ES to meet these deadlines.

Table 2 – Project Milestones and Deadlines

MILESTONE	DEADLINE
Kickoff Meeting	15 workdays from NTP
Certificates of Training, Credentials, etc.	20 workdays from NTP
Submit draft Front End Engineering Design (FEED) and Network Drawings	30 workdays from Kickoff Meeting
OCSD Review of draft FEED and Network Drawings	15 workdays from receipt of draft FEED
Submit final FEED and Network Drawings	10 workdays from receipt of OCSD Comments on draft FEED
Submit draft FDS	60 workdays from Kickoff Meeting
OCSD Review of FDS	15 workdays from receipt of draft FDS
Submit final FDS	10 workdays from receipt of OCSD Comments on draft FDS
Submit draft Initial Program Development Submittal	120 workdays prior to Factory Demonstration Test (FDT)
OCSD Review of draft Initial Program Development Submittal	15 workdays from receipt of draft Initial Program Development
Submit final Initial Program Development Submittal	10 workdays from receipt of OCSD Comments on Initial Program Development Submittal
Submit draft Final Program Development Submittal	60 workdays prior to FDT
OCSD Review of draft Final Program Development Submittal	15 workdays from receipt of draft Final Program Development
Submit final Program Development Submittal	10 workdays from receipt of OCSD Comments on Final Program Development Submittal
Submit draft Bench Test, Real Time Digital Simulation (RTDS), and FDT Procedures	40 workdays prior to bench test
OCSD Review of Bench Test, RTDS, and FDT Procedures	15 workdays from receipt of draft Bench Test Procedure
Submit final Bench Test, RTDS, and FDT Procedures	10 workdays from receipt of OCSD comments on draft Bench Test Procedure
Bench Test Completion	10 workdays prior to FDT
FDT and RTDS Testing	90 workdays prior to Construction Bid Advertisement

Table 2 – Project Milestones and Deadlines

MILESTONE	DEADLINE
Submit draft Load Shed and Substation LAN Specification Submittal	120 workdays prior to Construction Bid Advertisement
OCSD Review of draft Load Shed and Substation LAN Specification Submittal	15 workdays from receipt of draft Load Shed and Substation LAN
Submit final Load Shed and Substation LAN Specification Submittal	10 workdays from receipt of OCSD Comments on draft Load Shed and Substation LAN
Submit draft Training Plans & Materials Submittal	30 workdays prior to each training course
OCSD Review of Training Plans & Materials Submittal	15 workdays from receipt of draft Training Plans & Materials
Submit final Training Plans & Materials Submittal	10 workdays from receipt of OCSD comments on Training Plans & Materials
Submit draft FAT Procedure	90 workdays prior to FAT
OCSD Review of draft FAT Procedure	15 workdays from receipt of draft FAT procedure
Submit final FAT Procedure	30 workdays prior to FAT
Submit draft Operations Manual and Procedures (OMaP)	50 workdays prior to RAT, or 50 days prior to training of operations staff, whichever is sooner
OCSD Review of OMaP	15 workdays from receipt of draft OMaP
Submit final OMaP	60 workdays prior to RAT, or 30 days prior to training of operations staff, whichever is sooner
Completion of Pre-Commissioning Inspection Check / Punchlist	20 workdays prior to FAT
OCSD Review of Pre-Commissioning Punchlist Completion	15 workdays from receipt of punch list completion
Submit draft As-built Documentation Submittals	60 workdays prior to RAT
OCSD Review of draft As-built Documentation Submittals	20 workdays from receipt of As-built Documentation Submittals
Submit final As-built Documentation Submittals	10 workdays from receipt of OCSD Comments on draft As-built Documentation Submittals

III. PROJECT IMPLEMENTATION

All OCSD projects are divided into six phases. SEL ES shall provide engineering services for Phase 3 Design Services, Phase 4 Construction and Installation Services, Phase 5 Commissioning, and Phase 6 Closeout.

Phase 1 – Project Development – *Completed, Not in Scope of Work*

Phase 2 – Preliminary Design – *Not required, Not in Scope of Work*

Phase 3 – Design Services

Phase 4 – Construction and Installation Services

Phase 5 – Commissioning Services

Phase 6 – Closeout

PHASE 3 – DESIGN

SEL ES shall provide engineering services during Phase 3 for all detailed engineering design for the Load Shed and Substation LAN system, detailed network design drawings, detailed functional design specification, system integration, programming, and programming standards development. An overview of the responsibilities of OCSD's designated CONSULTANT and the construction Contractor are described in Table 1 – Responsibility Overview Matrix. Refer to Contract Documents for detailed requirements.

TASK 3.1 – PROJECT MANAGEMENT

SEL ES shall be responsible for project management, including project execution, scheduling to meet the construction contract milestones, budget, workshops, coordination with project bidding, and coordination with OCSD through Phase 3 – Design Services, Phase 4 – Construction and Installation Services, Phase 5 – Commissioning Services, and Phase 6 – Closeout.

SEL ES shall not reassign key personnel without prior acceptance by OCSD. OCSD may request reassignment of any of SEL ES's personnel, based on that individual's poor performance.

TASK 3.1.1 – DESIGN KICK-OFF MEETING

SEL ES shall convene a two-hour meeting at OCSD no more than two weeks after notice to proceed. This meeting shall cover the following:

- Team introductions
- Brief project overview
- Project execution (where and when work will be performed)
- Overall project schedule
- Sequencing constraints and procurement timelines
- Lines of communication
- Project management (scheduling, potential scope changes, invoicing, etc.)

TASK 3.1.2 – PROJECT MANAGEMENT PROGRESS MEETINGS

SEL ES shall prepare an agenda and conduct monthly project status conference calls with OCSD's Project Manager and Project Engineer. Status conference calls shall review the status of the project scope, budget, and any issues which may affect completion of the project. SEL ES shall also hold additional meetings as required to keep OCSD apprised of the job, to review work in progress, and to receive and resolve comments.

SEL ES shall prepare the meeting minutes as described below and transmit them to the OCSD Project Manager within three business days of the meeting in MS Word format using OCSD's template, or an approved substitution. SEL ES shall also update and transmit the Action Item Log, Decision Log, and Issues Log with the minutes.

The OCSD Project Manager will distribute the minutes for internal review. If there are no OCSD comments on the minutes, they will be considered final. If there are comments, the OCSD Project Manager will incorporate all appropriate OCSD comments on the MS Word file with changes tracked. The updated MS Word file will be transmitted back to SEL ES. If SEL ES has no comments on the OCSD edits, the minutes will be considered final. If SEL has further comments on the OCSD edits, those comments should be discussed with the OCSD Project Manager as needed, until both parties agree in writing or email on final version.

Informal Meetings

Informal meetings may include office meetings, telephone meetings, teleconferencing meetings, and conference calls shall be carried out as follows:

- SEL ES shall notify the OCSD Project Manager/Project Engineer prior to the meeting.
- SEL ES shall prepare minutes for the meeting.
- The minutes shall be submitted to the OCSD Project Manager/Project Engineer.
- After review and modification, the minutes shall be filed as a formal record of the meeting.
- A copy of all comments on project issues obtained by SEL ES from OCSD staff without direct OCSD Project Manager's involvement shall be submitted by SEL ES for the Project Manager's approval within three business days of the conclusion of the meeting. SEL ES shall make every effort to obtain alignment/agreement from OCSD Project Engineer and/or OCSD staff before submitting these issues to OCSD Project Manager.

Informal meetings that do not follow this procedure will not be recognized as having occurred.

TASK 3.1.3 – PROGRESS REPORTS

SEL ES shall submit monthly progress reports at the same time as monthly invoices that include the following contents:

- Work activities completed to date, in the current reporting period, and projected for the coming month.

- A brief description of outstanding issues and their potential for impact on scope, schedule (design, construction, and commissioning), budget (design, construction, and commissioning) and quality.
- Potential changes in the scope.
- Budget status including estimates of actual costs to date, earned value, costs to complete, and cost estimates at completion. The budget status over time shall be presented on a graph with associated tabular data indicating for each month the actual costs incurred, earned value, and planned value.
- A discussion of corrective actions to be taken to avoid or mitigate cases where estimated costs at completion exceed budgets.
- Schedule status, including an updated project schedule as a searchable color PDF and as native format electronic file.
- A discussion of corrective actions to be taken to avoid or mitigate cases where project schedule is expected to be delayed.
- Updated Project Decisions/Action items/Issues Log
- Overall project budget and schedule completion in graphical format on the same graph. Show actual budget used, original schedule completion, and actual estimated project completion on the graph.
- The approved WBS shall form the basis for reporting the status of each SOW task in the monthly project Progress Report and the project Invoices.

All calculations of earned value and estimates to complete shall be made at the same level of detail as included in the Cost Matrix and Summary submitted with SEL ES's proposal. Furthermore, for estimating earned value, tasks shall be further broken down to subtasks of no more than \$100,000. Progress Reports shall include the basis for estimating earned value for each task and subtask. See Exhibit 1 - Example of Monthly Progress Report.

TASK 3.1.4 – PROJECT INVOICES

SEL ES shall prepare and submit monthly invoices to OCSD no later than the first Wednesday of the following month. Invoices shall be submitted for every month that work is being performed, unless OCSD's Project Manager has provided prior approval for combining the work of two months into a single invoice. The invoices shall document the man-hours and billing rate for each person that works on the project for each task in the WBS. Overhead, profit, and any direct costs shall also be shown for each task. As part of the summary section of the invoice, SEL ES shall also include the following information at minimum:

- Budget
- Current billing period invoicing
- Previous billing period "total invoiced to date"
- Budget amount remaining
- Current billing period "total percent invoice to date"
- Current billing period "total percent completed to date"

The cost component breakdown for each element above shall match that of the Professional Services Agreement (PSA). The monthly progress report and project schedule shall be submitted with the project invoice as part of the monthly request and prerequisite for the payment. SEL ES shall provide the percent budget spent for each of OCSD's WBS cost codes (i.e. by work package and phase). OCSD shall provide a list of cost codes by phase to SEL ES. SEL shall provide a summary of progress and expenditures. OCSD will provide a sample invoice structure to SEL ES at the beginning of the project.

TASK 3.1.5 – PROJECT LOGS

SEL shall produce and maintain on at least a monthly basis the following logs through the course of the project:

Project Decision Log. The Project Decision Log shall track decisions made during workshops, meetings, submittal reviews, and any other forms of communication related to this scope. The log shall include the date of the decision, the title of the meeting where it was made (if applicable), a description of the decision, and a brief summary of the impacts.

Action Item Log. The Action Item Log is used to track action items generated during meetings. Action items may only be assigned to OCSD or SEL ES team members. If action is required by a different party, the action item shall be assigned to the person on the team who will track the action item. The action item log is not intended to include normal SEL ES tasks, nor to include comments on deliverables. The Action Item Log shall include a tracking number (typically coded to the date), the date it was created, a description of the action required, the lead person, and the date it was resolved. If action is required by more than one person, the person who will be asked to coordinate that action shall be listed.

Issues Log. The Issues Log shall list general comments and concerns raised by OCSD or SEL ES staff during project meetings. An example of an issue would be a request raised during a workshop for a specific programming method, graphic, or method of control. Issues that pose a moderate to significant impact to the Load Shed system architecture and design, or require additional consideration before final system design, shall be tracked on the Issues Log to be verified prior to completion of the detailed design. This log is not intended to track OCSD comments on submittals. The log shall include a short description of how the issue will be addressed. The Issues Log will be used to periodically confirm that the issue has been appropriately addressed.

Risk Mitigation Log. SEL ES shall prepare a log of all the mitigation measures recommended to be implemented. The log is likely to include measures to be taken during the design phase, as well as during the bid, construction, and commissioning phases. The log is not intended to track mitigation measures that would be implemented only when a particular risk occurs.

The log shall include the following information for each recommended mitigation measure:

- A brief description of the mitigation measure and the risk it is intended to address.
- A description of who has the lead to implement the measure.

- What components of the project design, specification, plans and other documents would need to incorporate or address the measure?
- The time frame for completing the measure.
- A brief summary of the status of the measure, to be used in on-going updates.
- The Risk Mitigation Measure Log will be used for on-going risk management and as a basis of reviewing SEL ES submittals.

TASK 3.1.6 – QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

SEL ES shall administer a program of QA/QC procedures for producing quality work and shall effectively manage and control the work for all tasks. Specific procedures shall include but not be limited to planning, coordination, tracking, checking, reviewing, and scheduling the work. SEL ES shall subject all work products prepared by SEL ES to in-house QA/QC procedures prior to submittal to OCSD. All non-conformances to this specification shall be documented by SEL and referred to OCSD for a written disposition. QA/QC hours and costs shall be incorporated into related tasks within this SOW.

TASK 3.2 – DESIGN SERVICES

SEL shall develop a detailed design for a fully functional Load Shed and Substation LAN system as described in this SOW. SEL ES shall provide all necessary engineering details required for the construction Contractor to install a complete Load Shed and Substation LAN system that is ready for programming, integration, testing, commissioning and operation by SEL ES. The system shall be similar to the system that will be installed on Project J-117B.

Load Shed System General Requirements

- Load Shed system shall utilize two (2) Load Shed controllers to achieve a redundant system.
- Perform electrical metering at all systems involved with the Load Shed system.
- Primary Load Shed scheme shall be contingency-based and backup scheme shall be underfrequency-based.
- The controller shall continually calculate, based on an operator configurable priority table, which loads are to be shed in a utility power loss event.
- Load Shed system shall support fast Load-Shedding and disconnection from utility before an under-frequency triggered event occurs.
- Operator initiated Load-Shed based on pre-defined priorities or known power availability and configuration.
- Load Shed controller shall detect loss of network connectivity to load shedding areas, and intelligently adjust the load calculation and Load Shedding decisions.
- Prevent nuisance Load Shedding due to communication failure between Substation LAN and protection relay or I/O device associated with the Load Shed scheme.

- Total time of Load Shed operation shall not exceed 100ms (from time of event detection to breaker(s) tripping).

Substation LAN General Requirements

The Substation LAN shall be designed as a dual LAN Parallel Redundancy Protocol (PRP) network with link recovery times, latency, and bandwidth sufficient for all applications listed in the section below. The Substation LAN shall employ quality of service (QoS) methodologies sufficient to prioritize GOOSE trip messages over less critical traffic. Environmental requirements for network hardware shall conform to IEC 61850 Edition 2. Inter-building links shall be via OS2 (single mode) or OM1 (multi-mode) fiber optic cabling. The Substation LAN shall be designed to securely interface with OCSD's industrial control system (ICS) network without degrading performance. Consideration should be given to how to address future expansion to additional power buildings (substations) while minimizing increases to network latency and recovery time.

Application Requirements

- IEC 61850 Edition 2 Type 1A performance class P1 GOOSE trip messaging.
- IEC 61850 MMS.
- Parallel Redundancy Protocol (PRP).
- PTP time synchronization - two GPS clocks installed at 12kV Service Center and the Thickening and Dewatering Building (as a backup). The clocks shall support time synchronization using IEEE 1588 PTP (Precision Time Protocol). All network devices between the GPS clocks and the IEDs shall support PTP time stamping.
- Sequence of event reporting including a centralized repository for events stored inside the Substation LAN, and the option to automatically and continually export SoE data to a server on the ICS network.
- Full Configuration of the SEL TEAM application on two OCSD provided servers and associated SEL devices to display alarms and record event data (SOE, Oscillography). This includes the SEL Event software application. Utilize TEAM Synch to replicate the event data to a read-only server in the ICS network.
- All SEL relays (installed or modified) on this project shall be capable of having their maintenance mode (alternate group settings) enabled and disabled via the existing OCSD electrical SCADA (residing on a separate ICS network). Secure interface will be needed between the Substation LAN and the ICS network to transmit the data.
- Secured administrative access to IEDs from the ICS network.
- Change management system capable of detecting changes to IED configuration and sending alerts to SMTP (e-mail) alerts hitting an SMTP relay server in the ICS-DMZ.
- Network monitoring with ability to send alerts to SMTP (e-mail) alerts hitting an SMTP relay server in the ICS-DMZ.

- Cisco switches are capable of sending SNMP traps to RTAC for switch status. SEL ES to configure the switches and RTACs to monitor health status.

Auto-Synchronization

SEL ES shall provide design and programming services to perform auto-synchronization for the two main breakers at the 12kV Service Center. Auto-synchronization for the 12kV Service Center main breakers shall be provided by two SEL-451 relays. SEL ES shall design and program the IEDs so that the SEL-451 relays will send raise/lower pulses to the SEL-700G relays, located in Cen-Gen, to adjust the voltage and speed of the generators through the existing generator controls described below. In addition, during islanding (loss of utility) conditions, the SEL-451 relays shall send information to one SEL-700G relay to enable that relay to communicate the information to the existing controls. The communication between the SEL-451 and SEL-700G relays shall occur over fast IEC 61850 communication protocols. The SEL ES solution shall seamlessly integrate with the existing controls with very limited modifications to the existing controls. Any configuration change to the existing controls, if accepted by OCSD, shall be clearly described by SEL ES. Fiber-optic links and miscellaneous communication equipment for the communication between the SEL-700G relays and the existing generator controls will be procured and installed by the construction Contractor. SEL ES shall support OCSD in coordinating the design and programming of the system by the Contractor in the construction phase. Presently auto-synchronization occurs at the Cen-Gen main breakers (connecting to 12kV Service Center busses) as described below. This functionality shall be retained. The SEL auto-synchronization at 12kV Service Center main breakers shall be designed to work in conjunction with this feature. Both synchronization actions shall be initiated from the existing OCSD SCADA system (which resides in a separate network from the substation LAN network). This task is to be performed by SEL ES at the discretion of OCSD and should be reflected as an optional item on the proposal. A viable solution shall be accepted by OCSD in the design workshops prior to proceeding forward with this effort.

Brief Summary of Operation of Existing Generation Controls:

The existing generator controls, which will remain, utilize Woodward MSLC (Master Synchronizer and Load Controller) and DSLC (Digital Synchronizers and Load Controllers). The MSLC performs the master control for the load control, controls the automatic synchronization for the main breakers on Cen-Gen Bus A and Bus B main breakers (depending on position of auto-synchronization hand switch), and is fully configured to operate with individual DSLC for each of the three engines. During automatic synchronization across the Cen-Gen main breaker, the MSLC communicates with the DSLCs for the engines to adjust the voltage and speed of the engine generators together. Voltage and frequency feedback signals are provided from PT circuits on either side of the Cen-Gen main breaker. When the voltage sources are in-synch, the MSLC closes an output contact to close the main breaker. The controller provides either phase matching or slip frequency automatic synchronizing. When the plant is operating in parallel with the utility, the master controller controls the overall real power output of the engine generators by communicating with the DSLC over the LonWorks network. Feedback signals for master load control are provided by analog 4-20 mA signals from power transducers located in the 12kV Service Center. The controller provides bump less loading and unloading against the power grid. It is capable of controlling plant load in either base load or constant utility import/export

control modes, and accurately share loads between the engine generators when operating isolated from the utility by setting all engine generators in isochronous load sharing to a chosen percentage of their individual rated loads. The controller accepts an analog 4-20 mA input from the Master PLC (separate existing PLC for Cen-Gen SCADA purposes) for remote adjustment of the master load set point. The controller accepts hard-wired inputs to enable automatic synchronization and to switch between base load and constant import/export control modes.

A summary of the functional requirements at the various buildings shall be as follows:

Plant 1

- 12kV Service Center (12kV SWGR-ESC BUS A and BUS B)
 - Utilization of existing SEL relays where possible while meeting functional requirements
 - Replacement/Upgrade of certain existing IEDs (intelligent electronic devices) as required to achieve design requirements (such as 351, 351A, 311L)
 - Addition of hardware to interface with existing IEDs
 - Load Shed location (all main and feeder breakers)
 - Auto-Synchronization location
 - Power data collection location
 - Circuit breaker opened/closed status location
 - Circuit breaker racked-in/out status location
 - Contingency breaker location (connection point to SCE utility power)
 - Load Shed controller/HMI client location
 - Substation LAN location
- CenGen Distribution Switchgear (12kV SWGR-CGS BUS A and BUS B)
 - Utilization of existing SEL relays where possible while meeting functional requirements
 - Replacement/Upgrade of certain existing IEDs as required to achieve design requirements (such as SEL 351, 351A, 311L)
 - Addition of hardware to interface with existing IEDs
 - Load Shed location (all main and feeder breakers)
 - HMI client location
 - Power data collection location
 - Circuit breaker opened/closed status location
 - Circuit breaker racked-in/out status location
 - Contingency breaker location
 - Substation LAN location
- CenGen Generator Switchgear (12kV BUS G)
 - Replacement of existing SEL 300G relays with new SEL 400G or 700G as required to achieve design requirements
 - Addition of hardware to interface with existing IEDs
 - Power data collection location
 - Circuit breaker opened/closed status location
 - Circuit breaker racked-in/out status location
- Power Building 7 (480V SWGR-7-A and SWGR-7-B)
 - New SEL relays for transformer virtual main (location for relay-relay tripping via 61850 communication)

- Substation LAN location
- Power Building 8 (480V SWGR-TFA and SWGR-TFB)
 - New SEL relays for transformer virtual main (location for relay-relay tripping via 61850 communication)
 - Substation LAN location
- Power Building 9 (480V SWGR-LA-A and SWGR-LA-B)
 - New SEL relays for transformer virtual main (location for relay-relay tripping via 61850 communication)
 - Existing GE F60 Relays on 480V main breakers are utilized for protection and transfer scheme logic. SEL shall provide a separate (alternate bid item) cost item to provide either a relay-based or RTAC based solution to implement a closed-transition transfer scheme on the existing switchgear lineup (Main-Tie-Tie-Main configuration). The solution shall be acceptable to OCSD prior to proceeding forward with detailed design. Existing GE F60 relays shall be included in the Substation LAN for SoE and time-synchronization.
 - Substation LAN Location
- Blower Building 1 (4.16kV SWGR-BLOWER)
 - New SEL relays for the main breakers located at the 4.16kV SWGR-BLOWER
 - Load Shed location for the two main breakers
 - Power data collection location for the two main breakers
 - Circuit breaker opened/closed status location for the two main breakers
 - Circuit breaker racked-in/out status location for the two main breakers
 - Substation LAN Location
- Blower Building 2 (12kV SWGR-J-A and SWGR-J-B, 480V SWGR JB-A and SWGR JB-B)
 - SEL relays for transformer virtual main (location for relay-relay hard-wired tripping)
 - Existing GE F60 and Multilin relays shall be included in the Substation LAN for SoE and time-synchronization. SEL shall provide a separate (alternate bid item) cost item to provide either a relay-based or RTAC based solution to implement a closed-transition transfer scheme on the existing switchgear lineup (Main-Tie-Tie-Main configuration) – scheme is similar to Power Building 9. The solution shall be acceptable to OCSD prior to proceeding forward with detailed design.
 - Substation LAN location
- Thickening and Dewatering Building (12kV SWGR-Q-A and SWGR-Q-B, 480V SWGR-QA-A, SWGR-QA-B, SWGR-QC-A, SWGR-QC-B)
 - New SEL relays for transformer virtual main (location for relay-relay hard-wired tripping)
 - Existing GE Multilin relays shall be included in the Substation LAN for SoE and time-synchronization.
 - Load Shed controller location
 - Substation LAN location
- SALS - Steve Anderson Lift Station – (480V SWGR-HB-A and SWGR-HB-B)
 - New SEL relays for transformer virtual main (location for future relay-relay tripping via 61850 communication). The upstream medium voltage power source for this is from Power Building 3. A separate project will install new relays

- o at Power Building 3. That project will provide programming for relay-relay tripping via 61850 communication. This project will install the relays at SALS.
 - o Substation LAN location
- Power Building 5 (12kV SWGR-5-A and SWGR-5-B, 480V SWGR-RA-A, SWGR-RA-B, SWGR-RB-A, and SWGR-RB-B)
 - o Substation LAN location
 - o The new SEL relays at this location will be designed, programmed, and installed by a separate project. However, this Substation LAN future expansion shall be accounted for in the overall integrated testing under this SOW.
- New (Future) Power Building 3
 - o Substation LAN location
 - o The new SEL relays will be designed, programmed, and installed by a separate project (P1-105). However, this Substation LAN future expansion shall be accounted for in the overall integrated design and testing under this SOW.
- Control Center
 - o HMI client location
- Electrical Maintenance Building
 - o HMI client location
- Power Building 6
 - o Replacement of Electro-mechanical Relays with SEL Relays (Including Door Replacements)
 - o Existing SEL Relays (to be installed by a separate project)
 - o Substation LAN Location

Plant 2

- Distribution Center A (12kV SWGR-DCA-A and SWGR-DCA-B)
 - o Replacement of existing relays with new SEL relays (location for relay-relay tripping via 61850 communication)
 - o Substation LAN location. DC-A shall be added to the J-117B Substation LAN ring between Headworks Standby PB and Cen-Gen.
- Power Building B (480V SWGR-DCSL-A and SWGR-DCSL-B)
 - o New SEL relays for transformer virtual main (location for relay-relay tripping via 61850 communication)
 - o Substation LAN location
- Power Building C (480V SWGR-CPB)
 - o New SEL relays for transformer virtual main (location for relay-relay tripping via 61850 communication)
 - o Connects to Power Building B Substation LAN switches
- Power Building D (480V MCC-G)
 - o New SEL relays for transformer virtual main (location for relay-relay tripping via 61850 communication)
 - o Connects to Power Building B Substation LAN switches
- New (Future) Distribution Center F
 - o Substation LAN location
 - o The new SEL relays will be designed, programmed, and installed by a separate project (P2-98). However, this Substation LAN future expansion shall be accounted for in the overall integrated design and testing under this SOW.

TASK 3.2.1 – BID DOCUMENTS

SEL ES shall provide engineering services to prepare biddable technical specification and other Bid Documents as required to meet design requirements. In this SOW, construction documents include the Load-shed and Substation LAN specification and any SEL ES related support documentation for OCSD's designated CONSULTANT to complete their design.

TASK 3.2.1.1 – TECHNICAL SPECIFICATIONS

OCSD's designated CONSULTANT shall be responsible for contents of all technical specifications (Divisions 01 through 17), including edited OCSD Master technical specifications, except for the Load Shed & Substation LAN specification. SEL ES shall prepare the Load Shed & Substation LAN specification.

TASK 3.2.1.2 – CONSULTANT PREPARED BID DOCUMENTS REVIEW

SEL ES shall review the network drawings and general network panel wiring diagrams prepared by OCSD's designated CONSULTANT for the Load Shed and Substation LAN elements and provide review comments.

TASK 3.2.1.3 – BID PHASE ACTIVITIES

SEL ES shall provide timely clarification and resolve errors and omissions identified during the bid phase activities and reissue updated documents.

TASK 3.2.2 – DESIGN SUBMITTALS

SEL ES shall provide submittals listed in this section. All drawings submitted shall be in searchable PDF format for 11-inch by 17-inch printouts with details and text clearly legible. Final drawing submittals shall be provided in both searchable PDF format and native AutoCAD files. SEL ES shall provide OCSD four weeks to review and comment on each submittal, unless stated otherwise in Table 2 – Project Milestones and Deadlines. The front-end engineering and network drawing submittals shall occur in the first part of the design. The OCSD designated CONSULTANT will then proceed with detailed design on the network drawings in their SOW based on these SEL ES submittals. The other design phase submittals shall be completed per the remaining design phase schedule. For each design submittal, current copies of all relevant project logs and a written response log to OCSD comments from the previous submittal, as applicable, shall be provided with the associated submittal.

TASK 3.2.2.1 – FRONT END ENGINEERING DESIGN (FEED) SUBMITTAL

- Front End Engineering Design (FEED) Report – SEL ES shall submit a report containing the analysis, evaluation, and recommendations for the following topics at a minimum:
 - Existing Hardware – SEL ES shall evaluate existing hardware capability to meet design requirements and proposed new hardware and design solutions. Existing SEL relays at 12kV Service Center and Gen-Gen should be utilized as much as possible to minimize switchgear modifications.
 - Plant 2 Modifications - SEL ES shall integrate the Plant 2 SOW within this project to the Substation LAN design that is being installed by Project J-117B. Any necessary integration documents and efforts shall be completed as part of this SOW. This applies to DC-A, PB-B, PB-C, and PB-D.

TASK 3.2.2.2 – NETWORK DRAWINGS SUBMITTAL

- Network Block Diagrams
 - SEL ES shall be responsible for the design of the following network drawings for the modifications described in this SOW:
 - Topological Diagrams that illustrate the overall Substation LAN topology. These diagrams will be used by the OCSD designated CONSULTANT as the basis for detailed design of fiber cabling between buildings.
 - Sample Riser Diagrams that provide detailed examples of cabling between each model IED to be connected and its local Substation LAN switches. These shall include all redboxes, protocol converters, cables, taps, terminating resistors, and any other component required for connectivity between each model IED used and the Substation LAN. These diagrams will be incorporated into the J-98 bid documents by the OCSD designated CONSULTANT.

TASK 3.2.2.3 – FDS AND RTDS SUBMITTAL

SEL shall provide the following design submittals as described in this SOW:

- Functional Design Specification
 - SEL shall develop a functional design specification that shall serve as the written basis of design for the Load Shed and Substation LAN system. The Load Shed and Substation LAN system shall be designed, programmed, and configured to integrate seamlessly into the overall integrated substation control, monitoring, and protections system. As part of the development process, SEL ES shall participate in workshops to establish detailed requirements. SEL ES shall schedule and execute the work such that the functional design specification is produced and submitted early enough that OCSD comments can be addressed and changes incorporated without any significant impact to the overall project schedule. The design will be similar to the J-117B design.

- RTDS Reports: SEL ES shall submit detailed analysis reports describing the results of the RTDS testing. The reports shall describe in detail all assumptions, input data, system configurations, calculation methods, conclusions, and recommendations resulting from the RTDS testing. The following reports shall be provided:
 - RTDS Model Validation Report
 - RTDS Under-frequency and Under-voltage Analysis Report
 - RTDS FDT Report

TASK 3.3 – DEVELOPMENT SERVICES

SEL ES shall perform all required configuration and programming services for all Load Shed and Substation LAN system hardware and software to provide a completely functional and operational Load Shed system. SEL ES shall define all interfacing requirements for the Load Shed and Substation LAN system, and coordinate with OCSD staff about network and security requirements. During the development process, OCSD will provide integration/programming support and feedback, and provide all necessary information to achieve a successful system integration. Development services shall include the following:

TASK 3.3.1 – SCADA/HUMAN MACHINE INTERFACE (HMI) SCREEN DEVELOPMENT

SEL ES shall develop the following HMI screens for the Load Shed and Substation LAN system. Screens shall be similar to and coordinated with the screens developed for Project J-117B:

- Overall simplified single-line diagram showing breaker status
- One detailed single line diagram per electrical switchgear being controlled by the Load Shed system. Detailed single line diagrams shall include at minimum power flow data (kW, amperes, voltage), switchgear in local/remote, and breaker status. Single line diagrams shall be provided for the following 12kV switchgear:
 - 12kV Electric Service Center
 - Cen Gen
 - Blower Building 1
- Contingency summary screen – this shall include two pre-set priority lists as provided by OCSD (i.e. dry weather priority and wet weather priority). This screen should display the present breaker status, bus connection, contingency status, present power, and load-shedding satisfaction for each contingency, as well as the details of each individual contingency. Information about the present power system operating scenario is also shown, allowing the user to tune the power management system (PMS) by setting the Incremental Reserve Margin (IRM) values. The operator is also able to enable or disable each contingency individually.

- Contingency cross point screen. This screen should display information about all the contingencies and their associated loads that are either a) selected, b) inhibited or c) unavailable for shedding. Across each contingency, the loads that are selected are highlighted in green, loads that are inhibited are highlighted in red and loads that are unavailable are greyed out. Using this screen, the operator is able to determine the response of the system to a particular contingency ahead of time.
- Underfrequency Load Shed summary and cross point screen. This screen should display the underfrequency thresholds, frequency, amount of load selected to shed, contingency satisfied status, and an input for the amount of load required to be shed. The UF Pickup (Hz) and the amount to shed values for the two levels will be provided by the customer. The UFLSP dynamically selects from the same load priority list as the contingency system to equalize the generation to load. The operator can input the minimum load to shed. Whether the contingency is enabled or disabled is automatically determined by the system. The underfrequency contingencies will be enabled as soon as the generator is isolated (islanded) from the utility. These load-shedding decisions are separate from the CLSP system algorithm and cover all causes for frequency drops that are not detectable by the contingency system.
- Load summary screen. This screen should display the present Breaker Status, Test Shed Select, Load Priority, Live Power (MW), Force Value of Power (MW), and Toggle Live Force values for each load. When a load-shedding event occurs, a yellow banner is displayed under the load number in the Load Number column. When the LSP is placed in Test mode, a red Test Mode Enabled banner is displayed in the upper left corner of the screen. This allows the operator to shed loads manually. This feature is typically used for testing the outputs responsible for tripping loads in the event of a load-shedding occurrence. The Toggle Live Force column is used in case of a measurement discrepancy. This allows the operator to input a known good value in the Force Value of Power column. By doing this, the operator overwrites the value of the load. The LSP will use the forced value for all load-shedding calculations.
- Pop-up load trend screen. The necessary parameters for Operators to evaluate system data shall be trended. This includes loading, generation, and utility data for each source/load being monitored by the PowerMax controller.
- Contingency Event Report. Event Reports are text files generated by the controller every time a contingency is triggered. They contain data about the contingency and resulting actions taken by the controller. The operator can analyze this report to gain information on a particular event that occurred. The controller (i.e., LSP1 or LSP2), the event that occurred, and the action that was taken are all identified, in addition to the MW selected to shed and the MW required to shed.
- PowerMAX diagnostic screen. The POWERMAX Diagnostics screen displays critical diagnostic information for the system. The indication fields on the POWERMAX Diagnostics screen will display a red background and flash for each of the areas affected by an alarm. This screen allows the operator to view all alarms, watchdog counters, and status indications for each of the POWERMAX controllers. Watchdog counters are used to check the integrity of the communications channel between the HMI, gateways, controllers, and

SCADA FEPs. When a watchdog counter stops responding, the HMI will wait for a brief period before issuing an alarm. The operator can reset alarms and trips for the controllers, as well as enable or disable each controller individually.

- PowerMAX alarm screen. This screen should display all alarms that were generated in the system and the time they were generated, acknowledged, and returned to normal. The alarms are selectable by group and can be filtered by substation, area etc. Acknowledgement buttons (Ack Visible, Ack All, and Ack Selected) are also provided.
- Network health monitoring screen for health of each switch
- Communication health for each connected IED / Controller (Load-Shedding and peer to peer communication)

Data from the Load Shed controller regarding Load Shed initiation and breaker trips initiated by the Load Shed controller will be read by the OCSD electrical SCADA system via the SEL security gateway device between the two separate networks.

SEL's HMI solution shall be developed on Aveva Wonderware System Platform for the HMI back end, and InTouch for System Platform for the HMI front end. Development and runtime licensing of the Wonderware software and hardware are to be provided by OCSD. SEL shall provide pricing for development and all programming services. This system shall be a shared Wonderware Galaxy Platform with the J-117B Load Shed system located on OCSD's ICS network. The Wonderware OI servers will communicate with the PMAX gateway RTAC via the SEL security gateway device. All HMI clients will be connected to OCSD's ICS network and communicate directly with the Wonderware System Platform servers over the ICS network.

TASK 3.3.2 – LOAD SHED CONTROLLER/RTAC PROGRAMMING

SEL ES shall perform all programming for the Load Shed Controller/Real-Time Automation Controller (RTAC). All programming shall be well organized and documented such that the program is easy to understand, maintain, and troubleshoot. SEL ES shall configure two (2) redundant SEL controllers to provide the following features:

- Contingency-based load-shedding for up to 16 contingencies.
- Under-frequency load-shedding system

TASK 3.3.3 – INTELLIGENT ELECTRONIC DEVICE PROGRAMMING

SEL ES shall perform all programming (Load Shedding and protective device settings) for all Intelligent Electronic Devices (IED) used for the Load Shed system, including but not limited to relay-to-relay communications, protective device settings, network configuration, event captures for SEL TEAM, arc flash detection settings, and "virtual-main" configuration. The programming shall be for up to 90 SEL relays. The programming shall be based on the coordination and arc-flash studies provided by OCSD. SEL ES shall be responsible for all other settings and overall integration of devices into the Load Shed and Substation LAN system. SEL shall be responsible for developing the frequency-based settings of the relays and the Load Shed system. SEL shall provide protective device settings for the three central generators. The three

central generators have similar ratings and design as one-another. IED tagging in the software and HMI shall be based on the device tags used in the design drawings. Programming of relay output trip and Load Shed contacts shall be coordinated with the contacts used on the design drawings.

TASK 3.3.4 – NETWORK DEVICE PROGRAMMING

SEL ES shall perform all network device programming for the Load Shed and Substation LAN system. All settings shall be coordinated and reviewed by OCSD. Network devices shall be configured with temporary passwords by SEL, and passwords shall be turned over to OCSD with delivery of equipment to site. OCSD will reset passwords on all networking equipment after commissioning.

TASK 3.3.5 – OTHER CONFIGURATION, PROGRAMMING & APPLICATION DEVELOPMENT

SEL ES shall configure, develop settings for, and otherwise integrate all other software and components utilized as part of the Load Shed and Substation LAN system. This includes, but is not limited to full configuration of MS Office, SEL TEAM, RTAC, and Architect software, as well as RTAC devices, GPS clocks, IRIG distribution hardware, and all other components and systems required for Load Shed system functionality.

TASK 3.4 – PRE-COMMISSIONING PROCEDURES

TASK 3.4.1 – BENCH TEST PROCEDURE

SEL ES shall develop bench test procedures with accompanying test sheets for the bench test. The test sheets and test procedures shall be submitted and accepted by OCSD prior to bench testing.

TASK 3.4.2 – FDT PROCEDURE

SEL ES shall develop FDT procedures describing the complete step-by-step testing of the Load Shed and Substation LAN system and relay-to-relay communications at the factory.

TASK 3.5 – TESTING IN DESIGN PHASE

TASK 3.5.1 – BENCH TEST

SEL ES shall execute an OCSD witnessed bench test according to the bench test procedure. The bench test consists of loading/importing the tag databases into an RTAC controller and SCADA server, and loading/importing the HMI graphics into an HMI workstation. The bench test is to assure coordination between the RTAC logic and SCADA graphics, not the logical operation of the program. Changes made to the RTAC program or SCADA program may require a repeat of the bench test for all software, at OCSD's discretion. Bench test shall be performed either at OCSD facility or SEL Irvine facility.

TASK 3.5.2 – REAL-TIME DIGITAL SIMULATOR TEST

SEL ES shall develop a system model in the RTDS and run simulations and tests to validate and confirm total Load Shed system performance. The RTDS should achieve a complete closed-loop testing environment by utilizing a digital model in conjunction with actual relays and be accompanied with a detailed analysis report. OCSD utilizes ETAP for performing system studies and can make the system model available to SEL ES for the purpose of this task. OCSD will provide kW and kVA data at all 12kV feeder breakers at the 12kV Service Center and Cen Gen for dry weather and wet weather conditions for use in the RTDS model. OCSD will provide generator nameplate data for the central generators. The model shall have sufficient detail to study areas of interest identified by SEL ES and OCSD. The testing shall evaluate the dynamic and transient responses of the generators, large motors and associated Variable Frequency Drives (VFDs), and the associated electrical busses. SEL ES shall build an electrical model of the system within the RTDS system and will test the system in a Hardware-in-the-Loop (HIL) configuration. All required test equipment shall be provided by SEL ES. This task and the associated RTDS reports are to be performed by SEL at the discretion of OCSD and should be reflected as an optional item on the proposal.

TASK 3.5.3 – FACTORY DEMONSTRATION TEST (FDT)

SEL ES shall perform FDT on the Load Shed and Substation LAN system according to the FDT procedure. SEL ES to provide FDT documentation indicating that system performance is satisfactory, prior to provision and delivery of systems to the Contractor. FDT procedures shall be developed by SEL ES and reviewed and accepted by OCSD prior to testing.

TASK 3.6 – WORKSHOPS

SEL ES shall hold workshops throughout the project to keep OCSD appraised of the job, review work in progress, share information, discuss project submittals, present findings of technical analyses, receive and resolve comments, and obtain decisions and direction by OCSD staff. This task outlines the major workshops to be convened or attended by SEL as part of, or in addition to, other tasks in this SOW. It is anticipated that efficiencies will be realized from the J-117B workshop efforts and documented decisions. As this is similar work, the relevant decisions and efforts shall be utilized for this project. For each workshop convened by SEL ES, SEL ES shall submit an agenda to OCSD for review at least one week prior to the workshop. Agenda to include the following:

- Topics: A listing of each topic to be covered with sufficient detail so that OCSD attendees can reasonably determine if their participation is needed or not. A one-line description is not typically sufficient for this purpose. The topic description shall include what information will be presented, and what decisions will be needed.
- Attendees: The agenda shall include both OCSD and SEL team members. The OCSD Project Manager will add the OCSD staff attendees to the agenda prepared by SEL ES, based on SEL's agenda and SEL's recommendation of which OCSD staff members should attend.

- Workshop time and place: SEL ES shall work with the OCSD Project Manager to set the workshop date and time. When held at OCSD offices, the OCSD Project Manager will reserve the conference room this case.
- A preliminary list of material to be provided at the workshop.

For each workshop convened by SEL ES, SEL ES shall transmit to OCSD the following by the time of the meeting:

- Hard copies of the agenda (if applicable), one for each attendee
- One sign-in sheet with the names of attendees pre-listed
- Native electronic files used for the presentation. With the exceptions noted below, hard copies of presentation materials will generally not be required. The OCSD Project Manager will make the electronic files available to the OCSD project team internally.
- Hardcopies of all materials that cannot be easily viewed when projected on a screen. Examples might include design drawings and spreadsheets.

SEL ES shall transmit the workshop meeting minutes to the OCSD Project Manager within three business days of the meeting in MS Word format using OCSD's template, or an approved substitution. SEL ES shall also update and transmit the Action Item Log, Decision Log, and Issues Log with the minutes.

The OCSD Project Manager will distribute the minutes for internal review. If there are no OCSD comments on the minutes, they will be considered final. If there are comments, the OCSD Project Manager will incorporate all appropriate OCSD comments on the MS Word file with changes tracked. The updated MS Word file will be transmitted back to SEL ES. If SEL has no comments on the OCSD edits, the minutes will be considered final. If SEL ES has further comments on the OCSD edits, those comments should be discussed with the OCSD Project Manager as needed, until both parties agree in writing or email on final version.

TASK 3.6.1 – NETWORK DESIGN WORKSHOP

SEL ES shall convene one two-hour network design workshop prior to starting detailed network design, at the SEL Irvine facility. During this workshop SEL ES and OCSD shall review elements of the network design proposed by SEL ES.

TASK 3.6.2 – FUNCTIONAL DESIGN SPECIFICATION WORKSHOPS

SEL ES shall convene one four-hour (initial discussion to discuss system requirements) and one four-hour (review draft and final) functional design specification (FDS) workshops at the Irvine SEL facility. These workshops shall serve to support the development and approval of the functional design specification, which shall be produced by SEL ES. The workshops shall highlight any differences between this project and the J-117B project.

TASK 3.6.3 – GRAPHICAL STANDARDS WORKSHOPS

SEL ES shall convene one four-hour graphical standards workshop to discuss the proposed HMI screens. This workshop will provide examples from previous projects and will set requirements and expectations for all graphics development tasks performed by SEL ES. The workshop shall highlight any differences between this project and the J-117B project.

TASK 3.6.4 – HMI/SCADA SCREEN DEVELOPMENT WORKSHOPS

SEL ES shall convene one eight-hour HMI/SCADA Screen Development workshop. During this workshop, OCSD personnel will review and comment on SEL-produced HMI screens to allow for a familiar and easy to understand solution for OCSD operators. The workshop shall highlight any differences between this project and the J-117B project.

TASK 3.6.5 – NETWORK WORKSHOPS

SEL ES shall convene one two-hour workshop on GOOSE messaging occurring on this project.

SEL ES shall convene two four-hour network configuration workshops to review detailed network configurations and administrative access. During these workshops, OCSD personnel will review and comment on SEL-produced switch configurations, configurations for all other configurable network devices, and determine design requirements and network architecture requirements for secure remote engineering access of the Load Shed and Substation LAN system components by OCSD personnel via the ICS network. The workshops shall focus on any differences between this project and the J-117B project.

TASK 3.6.6 – FDT PROCEDURE WORKSHOPS

SEL ES shall convene one two-hour FDT workshop. The workshop shall cover testing requirements, scheduling, test personnel requirements from OCSD and SEL ES, simulation methods, and test system architecture. The workshop shall highlight any differences between this project and the J-117B project.

TASK 3.6.7 – AUTO-SYNCHRONIZATION WORKSHOP

SEL ES shall convene two four-hour Auto-synchronization workshops. Workshop #1 shall cover the proposed SEL solution based on design requirements. Workshop #2 shall serve as a review of the detailed auto-synchronization design and control strategy.

TASK 3.7 – DEVELOPMENT SUBMITTALS

TASK 3.7.1 – TRAINING PLANS & MATERIALS SUBMITTAL

SEL ES shall propose training plans, agendas, and materials for all training provided by SEL ES. OCSD will review contents of training plans and material submittals and provide feedback as necessary. SEL ES shall then re-submit finalized training plans and materials.

TASK 3.7.2 – INITIAL PROGRAM DEVELOPMENT SUBMITTAL

Submittal shall include the following:

- Preliminary Program Flowchart: Programmer shall develop the preliminary program flowchart. See Exhibit 2 – Sample Program Flowchart.
- Preliminary HMI Graphics: Submit a draft of all unique graphics of the proposed HMI. This shall include system overviews, single-line graphics, configuration screens, alarm summary screens, network overview, diagnostics, and any other SEL ES standard/recommended graphics for a typical Load Shed system.

- Preliminary SCADA server tag database
- Preliminary RTAC tag database
- Preliminary Device Data Map Configuration Table
- Real IO list
- Preliminary Communications Traffic Flows Block Diagram
 - The intent of the communications traffic flows block diagram is to illustrate all traffic flows passing through the Substation LAN. SEL ES shall include the following detail at a minimum: All connected devices (including the HMI server, Load Shed controller, IEDs, clocks, security gateway, TEAM server, etc.) shall be represented as blocks. All traffic flows between devices shall be represented with a unique line identifying each protocol type and indicating the direction of the traffic flow. A brief description of the data being transmitted shall be included for each traffic flow, and in cases where the traffic flow is GOOSE, the publisher and subscribers shall be identified.

Completion of the programming standards workshop and the graphical standards workshop are required prior to this submittal.

TASK 3.7.3 – FINAL PROGRAM DEVELOPMENT SUBMITTAL

SEL ES shall include all up-to-date information for the following in the Final Program Development Submittal:

- Program Flowchart
- RTAC/Load Shed Controller Program: The final version of the untested program shall be completed for this submittal. All parameters, routines, subroutines, variables, etc. shall be completed prior to this submittal.
- SCADA server tag database
- RTAC tag database
- Real IO list
- Final HMI graphics: Include a complete set of HMI graphics screens (color printout screen captures)
- Communications Traffic Flows Block Diagram
- Device Data Map Configuration Table
- Training Materials

Completion of the RTAC/Load Shed Controller Programming Workshop and the HMI/Screen Development Workshops are required prior to this submittal.

TASK 3.7.4 – CERTIFICATES OF TRAINING, CREDENTIALS, ETC.

SEL ES shall submit certificates of training, credentials, resumes, and supporting documentation demonstrating competency for each technician, engineer, integrator, and SEL responsible for the design, development, programming, testing, and

commissioning of the Load Shed and Substation LAN system, or personnel providing training as part of this SOW.

PHASE 4 – CONSTRUCTION AND INSTALLATION SERVICES

SEL ES shall provide engineering services during Phase 4 for all detailed engineering design for the Load Shed and Substation LAN system, detailed network design (including drawings for the construction Contractor), functional design specification, system integration, programming, programming standards development, bench testing, and factory demonstration testing.

TASK 4.1 – PROJECT MANAGEMENT

The requirements specified in Task 3.1 Project Management for Phase 3 – Design Services shall also apply for Phase 4 – Construction, Phase 5 Commissioning Services, and Phase 6 Closeout.

TASK 4.1.1 – CONSTRUCTION KICK-OFF MEETING

SEL ES shall convene a two-hour meeting at OCSD no more than one (1) month after the notice to proceed has been issued to the construction Contractor. This meeting shall cover the following:

- Team introductions
- Brief project overview
- Project execution (where and when work will be performed)
- Overall project schedule
- Sequencing constraints and procurement timelines
- Lines of communication

TASK 4.1.2 – PROJECT MANAGEMENT PROGRESS MEETINGS

The requirements specified in Task 3.1 Project Management for Phase 3 – Design Services shall also apply for Phase 4 – Construction, Phase 5 Commissioning Services, and Phase 6 Closeout.

TASK 4.1.3 – PROGRESS REPORTS

The requirements specified in Task 3.1 Project Management for Phase 3 – Design Services shall also apply for Phase 4 – Construction, Phase 5 Commissioning Services, and Phase 6 Closeout.

TASK 4.1.4 – PROJECT INVOICES

The requirements specified in Task 3.1 Project Management for Phase 3 – Design Services shall also apply for Phase 4 – Construction, Phase 5 Commissioning Services, and Phase 6 Closeout.

TASK 4.1.5 – PROJECT LOGS

The requirements specified in Task 3.1 Project Management for Phase 3 – Design Services shall also apply for Phase 4 – Construction, Phase 5 Commissioning Services, and Phase 6 Closeout.

TASK 4.1.6 – QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

The requirements specified in Task 3.1 Project Management for Phase 3 – Design Services shall also apply for Phase 4 – Construction, Phase 5 Commissioning Services, and Phase 6 Closeout.

TASK 4.2 – DEVELOPMENT SERVICES

Tasks not fully completed in Phase 3 – Design Services, as they relate to development services, shall be completed in Phase 4 - Development Services to meet the Contractor's schedule.

TASK 4.3 – WORKSHOPS

The requirements specified in Task 3.5 Workshops for Phase 3 – Design Services shall also apply for Phase 4 – Construction, Phase 5 Commissioning Services, and Phase 6 Closeout. Any workshops not completed in Task 3.5 Workshops in Phase 3 – Design Services shall be completed in Phase 4 – Construction and Installation and/or Phase 5 – Commissioning Services, as required.

TASK 4.4 – SUBMITTALS

The requirements specified in the various Submittals sections for Phase 3 – Design Services shall also apply for Phase 4 – Construction, Phase 5 Commissioning Services, and Phase 6 Closeout. Any submittals not accepted by OCSD in Phase 3 – Design Services shall be completed and accepted by OCSD in Phase 4 – Construction and Installation and/or Phase 5 – Commissioning Services, as required.

PHASE 5 – COMMISSIONING SERVICES

Any requirements which are not completed in Phase 3 – Design Services or Phase 4 – Construction and Installation shall be completed in Phase 5 Commissioning Services and Phase 6 Closeout, as required.

TASK 5.1 – COMMISSIONING TEAM MEETINGS

SEL ES shall attend Commissioning Team meetings at OCSD request, to ensure coordination between key responsible parties throughout the commissioning process.

TASK 5.2 – PRE-COMMISSIONING

TASK 5.2.1 – PRE-COMMISSIONING INSPECTION

SEL ES shall perform field inspections to verify that the Load Shed and Substation LAN system is properly installed, including all SEL IEDs installed as part of the design.

TASK 5.3 – COMMISSIONING

SEL's commissioning staff members shall oversee and perform commissioning of the Load Shed and Substation LAN system. All components and equipment that require configuration and/or programming as part of the Load Shed and Substation LAN system shall be commissioned and put into service by SEL ES. The commissioning staff members shall be available to assist with troubleshooting during commissioning and to prepare operations manuals and procedures (OMAP). Commissioning efforts by SEL shall include on-site visits to participate in the development of stable process/systems.

The following are the anticipated steps of commissioning. The only test equipment provided by the Contractor for the Substation LAN, Load-Shed system, and associated hardware (including relays) is to perform the NETA acceptance testing of the protective relays. All other test equipment needed for the SEL systems shall be operated and provided by SEL ES, under the oversight of the SEL Engineer in charge. It is anticipated that the Contractor would be completing relay installations one building (substation) at a single time. As the plant will remain in operation, each switchgear must be fully operational after work is completed on that switchgear, before work can begin on another switchgear.

1. OCSD provides the coordination study with relay setpoints (not rdb files) to SEL ES for the protective relays.
2. Relay settings configuration (programming) files (native) are provided by SEL ES to OCSD.
3. OCSD provides relay programming files to the Contractor/NETA and provides oversight of testing. The NETA test company will test per the NETA Acceptance Testing Standards for relays (check functionality of relay for hard-wired trips and controls). This would not include relay-relay trips via the 61850 GOOSE communications.
4. At each building (substation), OCSD Engineer and Contractor perform loop testing. Loop testing involves verifying the I/O wiring between end devices and OCSD's PLC. Concurrently, OCSD Engineer and the Contractor will verify I/O wiring to each IED. OCSD Engineer will also verify ethernet connectivity to each IED. SEL ES will be required to assist on-site only at the first building to ensure configuration is adequate as it relates to this step.
5. For the entire system, Substation LAN network switches are to be configured and installed. Load Shedding system hardware is to be configured and installed. Fiber optic cabling is to be installed by the Contractor and accepted by OCSD.
6. Once items 1 through 4 are completed for each building and item 5 is completed for the system, then SEL ES shall proceed with performing the remaining items.
7. Substation LAN testing of complete system including relays, switches, and controller (to be included in the FAT procedure):
 - a. Test multiple failure scenarios, including but not limited to:
 - i. Link loss recovery including recovery time
 - ii. Controller fail-over, including all RTACs used for Load Shedding system
 - iii. Loss of PRP LAN A and loss of PRP LAN
 - iv. Time source failover between clocks
 - b. Communication to all connected devices

- c. Perform I/O testing of IEDs programmed in the TEAM application.
 - d. Perform I/O testing of IEDs programmed to the PowerMax HMI.
 - e. Time Synchronization
 - f. IEC prescribed GOOSE message time requirements
 - g. Security Gateway Functional Checks
 - h. Auto-synchronization functionality testing
 - i. All Applications & Software (including TEAM Software & associated SoE data, HMI functionality, administrative access, alarms, etc.)
8. Relay to Relay testing – to be performed by SEL ES (may occur in multiple short site visits based on relay installation sequence by the Contractor and to be included in the FAT procedure).
 9. Load Shedding System FAT (to be included in the FAT procedure)

TASK 5.3.1 – FAT PROCEDURES

SEL ES shall develop FAT procedures, to be performed upon completion, describing the automatic operation of the Load Shed and Substation LAN system and the relay-to-relay communications (Load Shedding and virtual mains). These procedures shall describe how each Load Shedding initiation event will be triggered (actual event or simulation) to demonstration proper operation in a real-world event. All modes of operation and interlocks shall be fully demonstrated.

TASK 5.3.2 – COMMISSIONING PROCEDURE WORKSHOPS

SEL ES shall participate in two four-hour commissioning procedure workshops. Topics that may be covered in these workshops include, but are not limited to:

- Review of FAT procedures
- Review of responsibilities and expectations of support from OCSD, SEL ES, and Contractor during the commissioning process
- Commissioning schedule and risks

The last workshop shall take place three weeks before the commissioning of the Load Shed and Substation LAN system. This workshop shall be convened by SEL ES and attended by Contractor and OCSD personnel.

TASK 5.3.3 – COMMISSIONING SUBMITTALS

TASK 5.3.3.1 – FAT PROCEDURE

SEL shall submit FAT procedures developed in Task 5.3.1 and the signed off, completed procedures to OCSD and the construction Contractor.

TASK 5.3.4– FUNCTIONAL ACCEPTANCE TEST (FAT)

SEL ES shall perform Functional Acceptance Testing (FAT) for the Load Shed and Substation LAN system per requirements in Section 16850, Load Shed and Substation Local Area Network Hardware, and Specification Section 01810, Commissioning. Any deviations from the FAT procedures, equipment failures, anomalies or system issues

during FAT shall be documented by SEL ES and reported to OCSD. All testing affecting the equipment shall be subject to quality assurance surveillance by OCSD.

TASK 5.3.5 – RELIABILITY ACCEPTANCE TEST (RAT)

The Load Shed and Substation LAN system shall operate without significant issues or errors for a period of seven days and in accordance with Section 01810, Commissioning, before OCSD's acceptance of the system.

TASK 5.3.6 – POST-DEVELOPMENT TRAINING

The following training shall be classroom-based, instructor-led format, convened locally at OCSD.

TASK 5.3.6.1 – LOAD SHEDDING AND SUBSTATION LAN TRAINING

Prior to RAT, SEL ES shall train OCSD personnel on the Load Shed and Substation LAN system. SEL shall provide one (1) eight-hour training session to provide the required training on the Load Shed and Substation LAN system to allow OCSD to completely maintain the system without any restriction (except modifying the internal calculation logic of the Load Shed PowerMax controller). This includes all hardware, applications, programming, and operator interfaces. Length and duration of the training sessions shall be provided in the proposal. The training shall focus on the key differences between this project and the J-117B project. Training shall include the following:

- Configuration of any device on the system after it has been replaced due to a failure
- Troubleshooting of the system in the event there is a device or communications failure
- Network architecture and SEL's implementation of the Substation LAN, including Ethernet switch and port configurations, protocols used, network monitoring, and security gateway configuration to allow remote access and transfer of data to the plant historian.
- Adding or removing loads for the Load Shedding system
- GOOSE configuration and adding, modifying or removing relay-to-relay GOOSE communications
- Adding or modifying HMI graphics for the Load Shedding screens
- Testing of the system after modifications
- Modifying IEC 61850 SCL files due to logical node and other changes
- Security gateway configuration, administration, and management of profiles

TASK 5.4 – OPERATIONS MANUAL AND PROCEDURES (OMAP)

SEL ES shall develop an Operations Manuals and Procedures (OMaP) document to describe the functionality of the system. OMaP shall be finalized and accepted by OCSD no less than 30 days prior to RAT. The OMaP shall include the following:

- Introduction – Introductory overview of system
- Design Criteria – Design information Tables
- Theory of Operation – Describe complete operations and functionality of system

- Equipment Controls – Narrative plus summary tables for controls and SCADA screens, plus how control system works
- SEL ES Recommended Procedures – Include all relevant reference material
- Safety – Identify safety alarms, equipment, and hazards
- Troubleshooting – quick-reference tables
- Maintenance – links to equipment service manuals

PHASE 6 – CLOSEOUT

Closeout tasks include completion of punch list items by SEL ES, final inspection, completion of record drawings, and electronic data submittals. SEL ES shall submit a final invoice at the completion of the project.

TASK 6.1 – AS-BUILT DOCUMENTATION

After completion of RAT, and any commissioning punch list items, SEL ES shall submit all as-built details, documentation, and drawings representing all aspects of the completed Load Shed and Substation LAN system. All programs, configuration files, and related documentation for the entire Load Shed and Substation LAN system shall be turned over to OCSD for review and acceptance. SEL shall submit all documentation typically provided by SEL ES for Load Shed systems (SEL ES standard documentation). Documentation shall be provided in native and pdf files per OCSD documentation requirements.

As-built documentation shall include:

- Ethernet switch configurations
- Security gateway configuration
- IED configurations and programming
- SEL Architect Project and IED IEC 61850 configuration files
- Load Shed Controller programming
- HMI server configuration and programming and graphics files
- Automation controller's configuration and programming
- Clock and time distribution settings and configuration
- TEAM server and software configuration and programming
- Settings, configuration, and programming for any other configurable or programmable device related to or part of the Load Shed and Substation LAN system.
- Communications Traffic Flows Block Diagram
- Device Data Map Configuration Table
- Final Completion Report
- Certifies that SEL has completed the installation and commissioning of the Load Shed and Substation LAN system
- Includes system supplier instruction and operational manuals and recommendations

TASK 6.2 – FINAL INSPECTION AND PUNCHLISTS

SEL ES's construction coordinator shall attend the final inspection job walk with the Contractor and OCSD staff. SEL ES shall make recommendations on the completion of the work including, but not limited to, completion of punch list items, overall system operability, and recommendations for follow-up work. SEL ES shall assist OCSD in developing punch lists of items required to be completed prior to final acceptance of the project by OCSD. Punch lists can include action items to be completed by OCSD, SEL ES, or the Contractor.

TASK 6.3 – SOFTWARE AND LICENSES

SEL ES shall submit to OCSD software licenses, software maintenance agreements, and software support agreements for all licensed software products used for the Load Shed and Substation LAN system. The expiration of software maintenance and support agreements shall occur no sooner than one year after the successful completion of the Reliability Acceptance Test (RAT). All software licenses, software support agreements, and software maintenance agreements shall be transferred to OCSD and registered to OCSD prior to the successful completion of RAT. Licenses shall include SEL-5045 AcSELERator TEAM Software license to collect data from up to 150 SEL IEDs and MS-Office.

TASK 6.4 – TRANSFER OF OWNERSHIP

All programming and associated documentation, excluding programming tools copyrighted by others, shall become the property of OCSD upon Final Completion. Any software licenses required for the ownership, maintenance, or operation of any application or service for the Load Shed and Substation LAN system shall be registered to OCSD, all software media, manuals, paper licenses and other associated materials shall be provided to OCSD upon system handoff.

TASK 6.5 – WARRANTY

SEL ES shall warrant all labor and services provided by SEL ES as part of this scope for a period of two years, beginning the day of acceptance of the Load Shed and Substation LAN system by OCSD. Warranty shall guarantee performance of the Load Shed and Substation LAN system, based on engineering and configuration parameters provided by SEL ES. Warranty services shall be performed expeditiously after notification by OCSD.

- Following necessary replacement or modification, SEL ES shall re-test the system and perform any additional procedures needed to place the complete system in satisfactory operation. Record documentation shall be updated to reflect modifications performed.
- Cost for all labor, travel, subsistence, and other expenses incurred in providing all services and service visits during the two-year warranty period shall be borne by SEL ES.

IV. GENERAL REQUIREMENTS

Working Hours

Meetings with OCSD staff shall be scheduled from Monday through Thursday between the hours of 7:00 AM and 4:00 PM. SEL's on-site staff shall conform to OCSD work schedules and safety standards. SEL shall coordinate any site inspection or work with the OCSD Engineer at least two weeks prior to the scheduled activity.

V. STAFF ASSISTANCE

OCSD staff member or designee assigned to work with SEL ES on the design and construction phase of this project is Sandip Patel at (714) 593-7383, e-mail to: sspatel@ocsd.com.

EXHIBITS:

- Exhibit 1 Example of Monthly Progress Report**
- Exhibit 2 Sample Program Flowchart**
- Exhibit 3 Not Used**
- Exhibit 4 Sample Bench Test Procedure**
- Exhibit 5 Plants 1 & 2 Overall Single Line Diagrams**
- Exhibit 6 OCSD Safety Standards**

SP:TW:dm

ATTACHMENT “I”

COST MATRIX & SUMMARY

Electrical Power Distribution System Improvements, Project No. J-98
 PSA Request for Proposal
 Attachment I - Cost Matrix and Summary Form

Task Item	Labor hours										Total Hours	Labor Fee	Total Subs	Allowable Direct Costs	Total Fees
	Engineer II	Engineer III	Technician	Specialist	Designer	Security Engineer	PM	Technical Editor	(insert role)	(insert role)					
5.3.2 Commissioning Procedure Workshops	16	8									24	0.00			0.00
5.3.3 Commissioning Submittals											0	0.00			0.00
5.3.4 Functional Acceptance Test (FAT)	120	50	70								240	0.00			0.00
5.3.5 Reliability Acceptance Test (RAT)											0	0.00			0.00
5.3.6 Post-Development Training	48	24									72	0.00			0.00
5.4 Operations Manual and Procedures (OMAP)	240	40						40			320	0.00			0.00
Subtotal - Phase 5 - Commissioning Services	528	146	86	0	0	0	8	64	0	0	832	0.00	0.00	0.00	0.00
PHASE 6 - CLOSEOUT															
6.1 As-Built Documentation	40	16									56	0.00			0.00
6.2 Final Inspection and Punchlists	80	40									120	0.00			0.00
6.3 Software & Licenses											0	0.00			0.00
6.4 Transfer of Ownership											0	0.00			0.00
6.5 Warranty											0	0.00			0.00
Subtotal - Phase 6 - Closeout	120	56	0	0	0	0	0	0	0	0	176	0.00	0.00	0.00	0.00
Optional Service - Auto Synchronization															
SEL-451 Autosync Design, Program and Test	290	43									333	0.00			0.00
Subtotal - Optional Service - Auto Synchronization	290	43	0	0	0	0	0	0	0	0	333	0.00	0.00	0.00	0.00
Optional Service - Main-Tie-Main															
Documentation	104	32						16			152	0.00			0.00
Development	104	40													
Testing	128	24													
Subtotal - Optional Service - Auto Synchronization	336	96	0	0	0	0	0	16	0	0	448	0.00	0.00	0.00	0.00
TOTAL - PHASES 4, 5 and 6 Rounded - Use for Attach E - Fee Proposal Form	5,374	1,170	86	40	80	120	708	240	0	0	7,818	0.00	0.00	0.00	0.00

Electrical Power Distribution System Improvements, Project No. J-98
PSA Request for Proposal
Attachment I - Cost Matrix and Summary Form

Task Item	Labor hours										Total Hours	Labor Fee	Total Subs	Allowable Direct Costs	Total Fees
	Engineer II	Engineer III	Technician	Specialist	Designer	Security Engineer	PM	Technical Editor	(insert role)	(insert role)					
Fully Burdened Hourly Rate (Includes Payroll costs, OH, and Profit)															
PHASE 3 - DESIGN															
3.1 Project Management							656				656	0.00			0.00
3.2 Design Services											0	0.00			0.00
3.2.1 Bid Documents	40	40									80	0.00			0.00
3.2.1.1 Technical Specifications											0	0.00			0.00
3.2.1.2 Consultant Prepared Bid Doc Review											0	0.00			0.00
3.2.1.3 Bid Phase Activities											0	0.00			0.00
3.2.2 Design Submittals											0	0.00			0.00
3.2.2.1 Front End Engineering Design (FEED) Submittal	310	126		40		40		16			532	0.00			0.00
3.2.2.2 Network Drawings Submittal	40	40			80	80					240	0.00			0.00
3.2.2.3 FDS and RTDS Submittal	380	56						64			500	0.00			0.00
3.3 Development Services											0	0.00			0.00
3.3.1 SCADA/Human Machine Interface (HMI) Screen Development	320	40									360	0.00			0.00
3.3.2 Load Shed Controller / RTAC Programming	700	88									788	0.00			0.00
3.3.3 Intelligent Electronic Device Programming	270	45									315	0.00			0.00
3.3.4 Network Device Programming	64	32									96	0.00			0.00
3.3.5 Other Configuration, Programming, and Application Development	120	24									144	0.00			0.00
3.4 Pre-Commissioning Procedures											0	0.00			0.00
3.4.1 Bench Test Procedure	80	24						16			120	0.00			0.00
3.4.2 FDT Procedure	80	24						16			120	0.00			0.00
3.5 Testing in Design Phase											0	0.00			0.00
3.5.1 Bench Test	164	64					24				252	0.00			0.00
3.5.2 Real-Time Digital Simulator Test	600	80									680	0.00			0.00
3.5.3 Factory Demonstration Test (FDT)	580	40					20				640	0.00			0.00
3.6 Workshops											0	0.00			0.00
3.6.1 Network Design Workshop	4	2									6	0.00			0.00
3.6.2 Functional Design Specification Workshops	16	8									24	0.00			0.00
3.6.3 Graphical Standards Workshop	12	6									18	0.00			0.00
3.6.4 HMI/SCADA Screen Development Workshop	16	8									24	0.00			0.00
3.6.5 Network Workshops	20	10									30	0.00			0.00
3.6.6 FDT Procedures Workshops	8	4									12	0.00			0.00
3.6.7 Auto-Synchronization Workshop	16	8									24	0.00			0.00
3.7 Development Submittals	260	60						48			368	0.00			0.00
3.7.1 Training Plans and Materials Submittal											0	0.00			0.00
3.7.2 Initial Programming Development Submittal											0	0.00			0.00
3.7.3 Final Program Development Submittal											0	0.00			0.00
3.7.4 Certificates of Training, Credentials, Etc.											0	0.00			0.00
Subtotal - Phase 3 - DESIGN	4,100	829	0	40	80	120	700	160	0	0	6029	0.00			0.00
PHASE 4 - CONSTRUCTION & INSTALLATION SERVICES															
4.1 Project Management											0	0.00			0.00
4.2 Development Services											0	0.00			0.00
4.3 Workshops											0	0.00			0.00
4.4 Submittals											0	0.00			0.00
Subtotal - Phase 4 - Construction & Installation Services	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
PHASE 5 - COMMISSIONING SERVICES															
5.1 Commissioning Team Meetings	8						8				16	0.00			0.00
5.2 Pre-Commissioning	16		16								32	0.00			0.00
5.2.1 Pre-Commissioning Inspection											0	0.00			0.00
5.3 Commissioning											0	0.00			0.00
5.3.1 Functional Acceptance Test Procedures	80	24						24			128	0.00			0.00