

FERNDALE UNIFIED SCHOOL DISTRICT
REQUEST FOR QUALIFICATIONS/REQUEST FOR PROPOSALS

Proposition 39
Energy Efficiency Measures

Date Issued:
May 15, 2017

Ferndale Unified School District Contact:

Jack Lakin, Superintendent
Ferndale Unified School District
1231 Main Street, Ferndale, CA 95536

Phone: (707) 786-5900
Fax: (707) 786-4865
Email: jlakin@humboldt.k12.ca.us

Project Manager Contact:

Patrick Owen, Project Manager
Redwood Coast Energy Authority
633 3rd Street, Eureka, CA 95501

Phone: (707) 269-1700, x 318
Fax: (707) 269-1777
Email: powen@redwoodenergy.org

Proposals Due on June 16, 2017 at 3:00 pm at
633 Third Street
Eureka, CA 95501
Fax or Email Proposals Will Not Be Accepted

TABLE OF CONTENTS

| | |
|---|----|
| Introduction and Overview | 3 |
| Statement of Work | 3 |
| | |
| Appendix A: Proposed Project Schedule | 8 |
| Appendix B: Proposal Response Requirements | 9 |
| Appendix C: Energy Services Contract | 14 |
| Appendix D: Performance Bond | 58 |
| Appendix E: Payment Bond | 60 |
| Appendix F: Technical Facility Profile | 62 |
| Attachment 1: ASHRAE Level II Energy Audit | |
| Attachment 2: DSA's PR 14-02 | |
| Attachment 3: DSA's IR A-10 | |

INTRODUCTION AND OVERVIEW

The Ferndale Unified School District (District) solicits proposals responsive to this Request for Qualifications/Request for Proposals from interested Energy Service Companies (ESCOs) to design, permit, install and commission all measures laid out in the Statement of Work. Responses are due **June 16, 2017**. A non-mandatory pre-proposal site visit and question forum will be held on **Wednesday, May 24, 2017 from 1:00 to 2:00pm** at Ferndale High School. The site visit and forum are designed to increase the likelihood that respondents have the applicable and appropriate information necessary to deliver proposed solutions that meet the district's expressed needs.

The District seeks an ESCO to complete the following for Ferndale Elementary School:

- Design and install domestic hot water controls
- Design and install central HVAC controls with Demand Control Ventilation

And the following at Ferndale High School:

- Remove the boiler water heating system and design and install an on-demand water heating system and propane unit heaters
- Design and install central HVAC controls with Demand Control Ventilation
- Remove and replace exterior lighting fixtures
- Install a lockable light switch in the gymnasium

This procurement for design build services is authorized as an energy service contract pursuant to Government Code section 4217.12. Prior to the potential award of a contract to the selected ESCO, the District Board of Directors will adopt a resolution as required by Government Code section 4217.12, finding that the anticipated cost to the District for implementation of the energy efficiency measures will be less than the anticipated marginal cost to the District of energy that would have been consumed by the District in the absence of this project. The contract with the selected ESCO will be the sole contract the District will hold for the completion of this project.

Proposers are responsible for checking Redwood Coast Energy Authority's (RCEA) website (www.redwoodenergy.org) for any addenda to the RFQ/RFP. In the case of interested ESCOs that are unable to attend the pre-proposal site visit, the District requests that they send their business name and contact information to Patrick Owen, Project Manager at powen@redwoodenergy.org. This will enable distribution of any addenda directly to interested ESCOs.

STATEMENT OF WORK

The selected ESCO must have the technical capability to address the following systems: mechanical, electrical, and plumbing. The ESCO will design and implement energy efficiency measures for both Ferndale High School and Ferndale Elementary. Engineer's cost estimates for non-lighting measures are included in the referenced ASHRAE Level 2 Energy Assessment completed by OurEvolution Energy & Engineering on 07/10/2015. Total projected available Prop 39 funds equal \$212,611.99. In addition to standard criteria used to determine best value, additional value will be placed on:

1. The ability of the ESCO to propose solutions that meet energy savings targets per the ASHRAE Level 2 assessment.

2. The ability of the ESCO to discuss, recommend and expand scope beyond the scope noted below while remaining on the Prop 39 budget. For example, Table 1 CIM-1 or Table 2 CIM-1 and CIM-2.
3. The ability of the ESCO to present installed costs per efficiency measure and to ensure expanded measures can be verified as being eligible for Prop 39 funding.

Ferndale Elementary School:

- a. Using the associated ASHRAE Level 2 Energy Audit Report (see Appendix 1), design and implement the identified energy cost reduction measures in Measure I.D.s LCM 1-5 and CIM-1 listed in *Table 1: Ferndale Elementary School – Energy Conservation Measure Summary* on page 2 of 65 in the Audit Report and summarized in the table below.

Table 1: Ferndale Elementary School Energy Conservation Measures

| Measure I.D. | Measure Description | Electrical Energy Savings (kWh/yr) | Fuel Oil Savings (Gallons) | Propane Savings (gallons/yr) | Total Energy Cost Savings (\$/yr) | Estimated Net Measure Cost |
|--------------|--|------------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------|
| LCM-1 | Repair pressure relief valve (PRV) on original classromm building boiler. | 0 | 193 | n/a | \$ 890.00 | \$ 368.00 |
| LCM-2 | Install timer on boiler controls and program outdoor temperature reset in original classroom building. | 0 | 414 | n/a | \$ 1,084.00 | \$ 413.00 |
| LCM-3 | Install new aquastats and lower boiler temperature setpoints in original classroom building. | 0 | 78 | n/a | \$ 370.00 | \$ 534.00 |
| LCM-4 | Remove heat tracer on domestic hot water line to kitchen. | 2,102 | n/a | n/a | \$ 357.00 | \$ 25.00 |
| LCM-5 | Install timer on domestic hot water heater serving kitchen. | 657 | n/a | n/a | \$ 112.00 | \$ 313.00 |
| CIM-1 | Install central HVAC controls with Demand Control Ventilation in Annex and Original Classroom Buildings. | 232 | n/a | 2,148 | \$ 6,233.00 | \$96,930.00 |

Ferndale High School:

- a. Using *Table 2. Ferndale High School -Energy Conservation Measure Summary* on page 3 of 65 of the ASHRAE Level 2 Energy Audit Report and as shown below, design and implement Measure I.D.s LCM-4, CIM-2 and CIM-3.
- b. CIM-2 consists of two parts: CIM-2.1-Remove existing DHW system and replace with on-demand system consisting of (2) 199,000 Btu/hr units staged in parallel, and CIM-2.2-Remove boiler and replace with (2) 250,000 Btu/hr units in the gymnasium and (2) 45,000 Btu/hr units in the bathrooms. The district will accept alternative proposals to CIM-2 that retain the energy saving performance metrics presented in Table 2, below. Alternative proposals to CIM -2 must substantiate energy and cost savings.

Table 2: Ferndale High School Energy Conservation Measures

| Measure I.D. | Measure Description | Electrical Energy Savings (kWh/yr) | Fuel Oil Savings (Gallons) | Propane Savings (gallons/yr) | Total Energy Cost Savings (\$/yr) | Estimated Net Measure Cost |
|--------------|---|------------------------------------|----------------------------|------------------------------|-----------------------------------|----------------------------|
| LCM-4 | Install lockable lighting switch on Metal Halide circuit. Operate lights only when necessary. | 8100 | n/a | n/a | \$ 1,377.00 | \$ 270.00 |
| CIM-2 | (CIM-2.1) Remove domestic hot water (DHW) system and replace with on-demand water heating system. (CIM-2.2) Remove boiler and replace with propane unit heaters. | 3948 | n/a | 2,276 | \$ 6,707.00 | \$37,185.00 |
| CIM-3 | Install central HVAC controls with Demand Control Ventilation in the Main Classroom Building. | 281 | n/a | 1,274 | \$ 3,305.00 | \$39,848.00 |

- c. Replace existing exterior High Intensity Discharge fixtures with LEDs while maintaining or increasing existing light levels and couple with appropriate controls as described in Table 3 below.
 - i. Protect existing lighting controls in the High School Gymnasium by installing a lockable, vandal resistant box to prevent undesired operation on all gymnasium lights.
 - ii. ESCO to provide instruction on the operation of lockable controls box to school staff/faculty.
 - iii. ESCO shall recommend and install appropriate controls associated the recommendations in Table 3 below.
 - iv. Engineer's cost estimate for exterior lighting and controls is approximated at \$9,904.14.

Table 3: Ferndale High School Exterior Fixture Replacement Schedule

| Existing Fixture | Existing Wattage | Existing Quantity | Location | Proposed Replacement | Proposed Quantity | Proposed Wattage | ESCO Proposed Fixture |
|--------------------------|------------------|-------------------|---|----------------------|-------------------|------------------|-----------------------|
| Pole-Mounted Barn Lights | 150 | 2 | Outside metal shop, back of main school | RAB ALED2T50 | 2 | 50 watt | |
| Floods | 400 | 3 | Gymnasium, above parking lot | Atlas PFL84LEDPC | 3 | 115 watt | |
| Wallpacks | 100 | 4 | Gymnasium, above parking lot | Atlas WSPS20LEDPC | 4 | 26 watt | |
| Security Floods | 200 | 4 | (1) on wood shop, (3) on Gym | Atlas PFSXW13LED | 4 | 13 watt | |

All lighting equipment (lamp, luminaire, fixture, etc.) selected must be eligible for California incentives and rebates.

The selected ESCO will be expected to work with the District to design/engineer the scope of work to meet the District's specific design and funding criteria, and to maximize the energy savings, and other relevant factors. In addition, the selected ESCO will be expected to complete the installation and

integration of the project based on a schedule as dictated by the District's funding sources for this project.

The proposal shall contain a detailed explanation of the complete project and delineation of all work tasks to be performed by the awarded ESCO. The proposer must have the technical capability and capacity as well as the demonstrated experience to complete the project as set out in this RFP.

The selected ESCO will be expected to furnish any and all electrical, structural and mechanical designs and specifications that are requested and/or required by the Division of State Architects (DSA), the City of Ferndale, or any other regulatory bodies with jurisdiction over the project.

Installation of the system is subject to California prevailing wage requirements, and the selected ESCO and its subcontractors are required to pay all workers employed for the performance of this contract no less than the applicable prevailing wage rate for each such worker and to satisfy all monitoring and reporting requirements. Per Labor Code Section 1725.5, only licensed contractors who are registered with the state Department of Industrial Relations (DIR) to perform public works are allowed to contract with the District.

The selected ESCO will work with the District and its representatives to determine the best approach for design. Final scope approval will be given prior to installation.

After approval of a final design by the District and the Energy Manager, and after receiving any necessary regulatory approvals, the ESCO shall provide all necessary materials, equipment, and labor to construct and successfully complete the energy efficiency upgrades described in the Statement of Work and shall commission all systems.

The ESCO shall provide approved training for designated District personnel in the operation of the HVAC and DHW systems, including the operation and maintenance of thermostats, time clocks and other features as requested by the school. The ESCO shall provide the school with written instructions and procedures for shut-down and start-up activities for all components of the system.

All project services will comply with Proposition 39 Guidelines.

The ESCO will provide any necessary data and coordinate the project with all Prop 39 submissions and reporting requirements.

DSA's Procedure for Regulations (PR), PR 14-02, Procedure: Exempt Concurrence may be found at the following link: https://www.documents.dgs.ca.gov/dsa/pubs/PR_14-02.pdf

DSA's Interpretation of Regulations (IR), A-10, Alteration and Reconstruction Projects-DSA Approval Exemption may be found at the following link:
https://www.documents.dgs.ca.gov/dsa/pubs/IR_A-10_rev06-30-16.pdf

All equipment provided by the ESCO for this Project shall have a history of successful operating experience in similar installations and shall be in new, unused condition. This equipment shall be current technology with readily available non-proprietary replacement parts. All equipment used for this Project shall be approved by the District prior to installation.

Contractor's duties shall include but may not be limited to the following:

- Prepare construction documents where necessary
- If necessary, hire design professionals to create plans and specifications for DSA approval
- Ensure compliance with governing codes and standards including, but not limited, to Title 24 Standards and the California Building Code
- Provide a Site Specific Safety Plan
- Ensure compliance with CEC Loan Agreement, if any, for all relevant installations
- Ensure the District participation and feedback in scoping process
- Provide a schedule for completion of Project
- Prepare a plan for ongoing equipment maintenance and system upgrade, if requested
- Assist the District in securing all relevant rebates including rebates from programs such as the Redwood Coast Energy Watch program
- Ensure delivery of all materials and equipment to Site(s)
- Construct/Install Project
- Manage all sub-contractors
- Meet regularly to update the District representatives as to Project progress
- Obtain and maintain all licenses, permits, and authorizations as needed for the Project
- Commission Project; provide training on equipment/systems if requested
- Provide assistance with DSA close-out, if required
- Post installation audit and energy savings tracking pursuant to Proposition 39 guidelines

APPENDIX A: PROPOSED PROJECT SCHEDULE

The following schedule is the proposed schedule, and may change during the project.

| ACTIVITY | DATE |
|--|--------------------------------------|
| Issue RFQ/RFP | May 15, 2017 |
| Pre-Proposal Site Visit | May 24, 2017 @ 1:00 pm |
| Responses Due | June 16, 2017 |
| Review and Selection of Finalist(s) | June 16 – June 27, 2017 |
| Interviews Scheduled and Conducted | TBD |
| ESCO Selected/Notice of Award issued | June 28, 2017 |
| Contract Finalized/Notice to Proceed issued | July 10, 2017 |
| Conduct Design Work | June 2017 – April 2018 |
| A) Finalize Design - for Summer 2017 Construction | no later than July 17, 2017 |
| B) Finalize Design – for Summer 2018 Construction | no later than May 2018 |
| Build Project | no earlier than July 17, 2017 |
| Construction Complete | August 2018 |
| Project Close-out and System Commissioning | August 2018 |

APPENDIX B: PROPOSAL REQUIREMENTS

For further information, please contact:

Patrick Owen, Project Manager
Redwood Coast Energy Authority
633 3rd Street, Eureka, CA 95501

Phone: (707) 269-1700, x318
Fax: (707) 269-1777
Email: powen@redwoodenergy.org

PROPOSAL REQUIREMENTS:

Provide one (1) unstapled original, three (3) copies and one (1) electronic copy on CD or scan disk. Proposals should be sealed and submitted to the Project Manager as described below. Fax or email proposals will not be accepted. **Late responses will not be accepted.**

SUBMITTAL OF REPSONSES

Proposals shall be received at the RCEA office at or before 3:00 P.M., on June 16, 2017.

ALL MAILED PROPOSALS SHALL BE ADDRESSED AS FOLLOWS:

RFQ/RFP Submittal
Attn: Patrick Owen, Project Manager
Redwood Coast Energy Authority
633 3rd Street
Eureka, CA 95501

The envelope shall also indicate the name and address of the submitting firm, with “DO NOT OPEN UNTIL PROPOSAL DUE DATE” on the front of the envelope.

HAND DELIVERED COURIER OR PACKAGED DELIVERED SERVICE SHALL BE DELIVERED DIRECTLY TO:

Redwood Coast Energy Authority
633 3rd Street
Eureka, CA 95501

Each proposal shall be submitted in writing and must include the following information:

ESCO PROFILE & QUALIFICATIONS

The District may award the contract to the firm that, in its sole opinion, is the most capable of providing the range of services described in this RFP. To be considered for this Project, a proposer must, at a

minimum, have demonstrated knowledge and experience in design, engineering and construction capabilities relevant to the scope of this RFP. The proposal must contain a response to each of the following:

- ***Answer all questions or state “N/A” if not applicable.***
 - ***Please number and re-state each subheading or question, followed by your response. This improves clarity and makes it much easier to evaluate your response.***
 - ***Number all pages.***
1. Name, address, contact numbers, email, website, and summary of the responding ESCO’s experience with public school projects and energy upgrades.
 2. Provide information on the ESCO’s type of business entity, its ownership, size, and location of its principal office.
 3. All applicable licenses including contractor’s license numbers and expiration dates.
 4. Detailed resume(s) of personnel to be assigned to the Project.
 - a. Identify proposed sub-ESCO(s) by name, address, and work to be performed.
 - b. Summarize the scope of services (design, construction, training, etc.) directly offered by ESCO.
 - c. Describe your qualifications and ability to design and install HVAC systems and system controls, DHW systems and controls, and lighting systems and controls.
 5. List at least three (3) applicable design and/or construction projects completed by the ESCO and proposed Sub-contractors within the past five (5) years that are similar in size and scope. Identify similar projects by name, location, owner, size, and date constructed.
 - a. Include a list of references including contact names and telephone numbers for the representative projects.
 - b. Source of funds used for the project (if known).
 6. Describe your general approach to designing and constructing building systems and how the District will be involved in the process?
 7. Please provide a preliminary design and implementation plan. Proposals that do not include all requested measures will be considered. As mentioned in the Statement of Work section, In addition to standard criteria used to determine best value, additional value will be placed on:
 - a. The ability of the ESCO to propose solutions that meet energy savings targets per the ASHRAE Level 2 assessment.
 - b. The ability of the ESCO to discuss, recommend and expand scope beyond the scope noted below while remaining on the Prop 39 budget. For example, Table 1 CIM-1 or Table 2 CIM -1 and CIM-2.
 - c. The ability of the ESCO to present installed costs per efficiency measure and to ensure expanded measures can be verified as being eligible for Prop 39 funding.

8. The selected ESCO must enter into a written agreement for the services using the District's standard form agreement for Design-Build Services (the "Agreement"), a copy of which is included as Attachment "C." The Agreement includes the following indemnity requirement:

"ESCO shall indemnify, defend with counsel acceptable to District, and hold harmless to the full extent permitted by law, District, its governing board, officers, agents, employees, and volunteers from and against any and all liability, demands, loss, damage, claims, settlements, expenses, and costs (including, without limitation, attorney fees, expert witness fees, and costs and fees of litigation) (collectively, "Liability") of every nature arising out of or in connection with ESCO's acts or omissions with respect to this Agreement, except such Liability caused by the active negligence, sole negligence, or willful misconduct of the District. This indemnification obligation is not limited by any limitation on the amount or type of damages or compensation payable under Workers' Compensation or other employee benefit acts, or by insurance coverage limits, and shall survive the expiration or early termination of this Agreement."

9. Public works ESCOs and Sub-contractors must be registered with DIR, as specified in Labor Code section 1771.1(a). Project is subject to compliance monitoring and enforcement by DIR.

10. Proposed Price

- The proposed price shall include all project costs (including design fees, DSA fees, permits, materials, labor, testing, commissioning, inspection, etc.)
- The proposed price must include a breakdown of Total Installed Cost for each measure using the below format:

| Location | Measure # | Description | Total Installed Cost |
|---------------------|-----------|--|----------------------|
| Ferndale High | LCM-4 | Install lockable lighting switch on MH circuit, operate lights only when necessary | \$_____ |
| Ferndale High | EEM2 | Replace exterior HID lights with LED; Add controls | \$_____ |
| Ferndale High | CIM-2.1 | 1) Abandon boiler and replace with propane unit heaters | \$_____ |
| Ferndale High | CIM-2.2 | 2) Remove existing DHW system and replace with on-demand water heating system | |
| Ferndale High | CIM-3 | Install central HVAC control with demand control ventilation | \$_____ |
| Ferndale Elementary | LCM-1 | Replace pressure relief valve (PRV) on boiler | \$_____ |
| Ferndale Elementary | LCM-2 | Install timer on boiler controls and program outdoor temperature reset | \$_____ |
| Ferndale Elementary | LCM-4 | Remove heat tracer on hot water line to kitchen | \$_____ |
| Ferndale Elementary | LCM-5 | Install timer on domestic hot water heater and heat tracer | |
| Ferndale Elementary | CIM-1 | Install centrally controlled WIFI enabled thermostats with Passive Infrared (PIR) occupancy detection and Demand Control Ventilation | \$_____ |
| Ferndale Elementary | LCM-3 | Install new aquastats and Lower boiler water temperatures | \$_____ |

ESCOs will be required to comply with the Proposition 39 Program requirements.

The payment schedule will be consistent with the funding allocation schedule. The ESCO will agree to maintain and make available records for inspection by the District and other agencies, and will provide or assist the District in providing required annual and final reports for the project, including data for reports to the Proposition 39 Citizens Oversight Board.

The ESCO will comply with and give notices required by laws, ordinances, rules, regulations, and lawful orders of public authorities bearing on performance of the Work, including but not limited to data and reports to the California Energy Commission required under Proposition 39.

ESCO acknowledges that all work must qualify as an eligible project under Proposition 39; and that the Statement of Work may be amended to reflect changes in funding allocation and District's Energy Expenditure Plan, upon mutual agreement of the Parties and a written amendment to this Contract related to any changes in scope, payment, and duration. Prior to commencement of any Work, District shall review and approve the Project.

AGREEMENT

The selected ESCO must enter into a written agreement for services using the District's form agreement for Energy Services (the "Contract"), a copy of which is included as **Attachment C**. The Contract includes the following indemnity requirement:

"ESCO shall indemnify, defend with counsel acceptable to Ferndale Unified School District, and hold harmless to the full extent permitted by law, Ferndale Unified School District, its governing board, officers, agents, employees, and volunteers from and against any and all liability, demands, loss, damage, claims, settlements, expenses, and costs (including, without limitation, attorney fees, expert witness fees, and costs and fees of litigation) (collectively, "Liability") of every nature arising out of or in connection with Consultant's acts or omissions with respect to this Agreement, except such Liability caused by the active negligence, sole negligence, or willful misconduct of the Ferndale Unified School District. This indemnification obligation is not limited by any limitation on the amount or type of damages or compensation payable under Workers' Compensation or other employee benefit acts, or by insurance coverage limits, and shall survive the expiration or early termination of this Agreement."

SELECTION PROCESS:

A selection committee will review the proposals and may select a short list of finalists for oral interviews.

REFERENCE CHECK. The District will conduct a background/reference check of the responding firms. Proposed ESCOs that appear to have the necessary qualifications and who are acknowledged as competent to provide the services requested may be placed on the short list of finalists and interviewed.

INTERVIEW. The District may interview selected respondents.

FINAL SELECTION. Predicated upon thorough review of proposals submitted and upon interviews with selected firms, the District will make a final selection and notify all finalists in writing.

The District will negotiate the final terms for services with the firm approved by the District Board. If it is not possible to reach mutual agreement with the designated firm, the District reserves the right to enter into negotiations with another firm.

The final selection will be made on the basis of best value, which includes, but is not be limited to the following criteria:

- Completeness and adherence to the requirements of this RFP.
- Qualifications and past similar experience.
- References.
- Fee and rates and base price proposal.

The District reserves the right to postpone selection for its own convenience, to withdraw this Request for Proposal at any time, and to reject any and all submittals without indicating any reason for such rejection. Submitted proposals become the property of the District.

As part of the negotiation process, the District reserves the right to require correction of technical errors in the proposal and to modify the published Statement of Work and to approve or disapprove the list of sub-consultants. Should the District determine that specific expertise is lacking in the project team, the District will reserve the right to request specific consultants with specific expertise to be added to the team. Any interpretation of, or change in, this Request for Proposal will be made by addendum, and shall become part of the Request for Proposal and any contract awarded.

Note: Pursuant to Government Code section 4529.12, District employees are prohibited from participating in the selection process when they have a financial or business relationship with any private entity seeking to enter into a contract with the District, and the District requires compliance with all laws regarding political contributions, conflicts of interest or unlawful activities.

The District reserves the right to contract with any entity responding to this Request for Proposals. The District makes no representation that participation in the Request for Proposal process will lead to an award of contract or any consideration whatsoever. The District shall in no event be responsible for the cost of preparing any proposal in response to this Request for Proposals. The selection of ESCO(s) to participate in the Request for Proposal process if at all is at the sole discretion of the District.

From the period beginning on the date of the issuance of this Request for Proposals, and ending on the date of the award of the contract, no person, or entity submitting in response to this Request for Proposals, nor any officer, employee, representative, agent, or consultant representing such a person or entity shall contact any person within the District to engage in discussion of the process of selection or award process except for the District designee for questions listed in this Request for Proposals.

APPENDIX C: ENERGY SERVICES CONTRACT

CONTRACT

This Energy Services Contract (“Contract”) is made by and between the Ferndale Unified School District (“District”), and _____ (“ESCO”).

District and ESCO hereby agree as follows:

RECITALS

WHEREAS, Government Code sections 4217.10, *et seq.*, authorize the District, as a public agency, to enter into an energy services agreement wherein the ESCO provides conservation services to the District from an energy conservation facility on terms that its governing body determines are in the best interest of the District;

WHEREAS, pursuant to Government Code section 4217.11(d), “conservation services” include electrical, thermal, or other energy savings resulting from conservation measures, which shall be treated as a supply of such energy;

WHEREAS, through this Contract, the District intends to contract for the engineering, system design, fabrication and installation of HVAC, domestic hot water and lighting systems and system controls that will result in energy savings to the District and which shall be a supply of energy to the District (the “Project”) at the following sites: Ferndale Elementary School and Ferndale High School (the “Project Sites” or “Sites”, and each individually a “Site”), consistent with the terms of Government Code section 4217.10, *et seq.*;

WHEREAS, the District’s Governing Board, after holding a hearing at a regularly scheduled public hearing and after having provided two weeks advanced notice of such hearing, made all findings required by Government Code section 4217.12 for the District to enter into this Contract;

WHEREAS, the ESCO shall engineer, design, and construct the Project pursuant to this Contract, including but not limited to certain General Terms and Conditions and other Contract Documents (as that term is defined in the General Conditions), which Contract Documents are incorporated into the Agreement by this reference;

NOW, THEREFORE, in consideration of the covenants hereinafter contained in this Contract, the District and ESCO agree as follows:

1. Description of Work

The ESCO will provide the design, construction, commissioning and installation of a Proposition 39 funded project at Ferndale Elementary School and Ferndale High School in the Ferndale Unified School District. The ESCO agrees to furnish all labor, materials, equipment, plant, tools, supervision, appurtenances,

and services, including transportation and utilities, required to perform and satisfactorily complete all work required for the Project. The ESCO agrees to furnish any and all electrical and mechanical designs and specifications including but not limited to performance specifications, system layout and mounting diagrams, electrical drawings and calculations, mechanical drawings and calculations complete with stamp and signature of a licensed California Engineer per the project schedule in Appendix A of the Request for Qualifications/Request for Proposals.

It shall be the responsibility of the ESCO to obtain DSA approval of the Project plans. No work shall commence at any site prior to DSA approval of the Project plans.

2. Contract Documents

The Contract Documents consist of the Complete Proposal Documents, as submitted by ESCO, including applicable drawings and calculations, the Contract, any Amendment thereto, Schematic Drawings and Specifications, Supplementary General Conditions, if any, General Conditions, Detailed Project Schedule, Request for Proposals, Disabled Veteran Business Enterprises Requirements (if applicable), Labor Compliance Program (if applicable), all addenda, required bond(s) and insurance certificates, completed Project Questionnaire, ESCO Prequalification, all of which are incorporated herein by this reference. All Contract Documents are intended to coordinate so that any work called for in one document and not mentioned in another document is to be executed as if mentioned in all documents.

3. Proposals & Compensation

As full compensation for ESCO's complete and satisfactory performance of the work and activities described in the Contract Documents, District agrees to pay ESCO, and ESCO agrees to accept the sum of _____, which shall be paid to the ESCO according to the Contract Documents.

4. Prevailing Wages

This Project is subject to prevailing wage requirements, and ESCO and its Sub-contractors are required to pay all workers employed for the performance of this contract no less than the applicable prevailing wage rate for each such worker.

5. Time for Completion

The starting date of the Contract shall be the day listed by the District in the Notice to Proceed and the ESCO shall fully complete all the work as detailed in accordance with Attachment A of the RFP: Proposed Project Schedule. Time is of the essence in the performance of this Contract.

6. Liquidated Damages

Liquidated damages for ESCO's failure to complete the Contract within the time fixed for completion are established in the amount of \$ 200 per calendar day.

IN WITNESS WHEREOF, the parties agree to the terms of this Contract on the day and year written below.

District

ESCO

Resolution No. _____

Contractor's License No.
and Expiration Date

Date

By: _____
Individual Signature

Title

Date

For:

Corporation or Partnership
If Corporation, Seal Below.

Approved As to Form

By: _____
Legal Counsel

Date

**General Conditions to Design-Build Contract for:
Proposition 39 Energy Efficiency Upgrades
Ferndale Unified School District**

GENERAL CONDITIONS TABLE OF CONTENTS

| | |
|---|-----------|
| 1. DEFINITIONS | 20 |
| 2. PROJECT MANAGER | 21 |
| 3. CONTRACT DOCUMENTS | 21 |
| 4. INTENT OF DRAWINGS AND SPECIFICATIONS | 23 |
| 5. TRADE DIVISIONS | 23 |
| 6. MASTER MANDATORY PROVISIONS | 24 |
| 7. ESCO | 24 |
| 8. RESPONSIBILITY OF ESCO | 25 |
| 9. SUB-CONTRACTORS | 25 |
| 10. PERFORMANCE AND PAYMENT BONDS | 25 |
| 11. INSURANCE | 26 |
| 12. CODES AND REGULATIONS | 29 |
| 13. PERMITS AND TAXES | 29 |
| 14. PATENTS AND ROYALTIES | 30 |
| 15. SAFETY AND FIRE PREVENTION | 30 |
| 16. HAZARDOUS MATERIALS | 30 |
| 17. TEMPORARY FACILITIES | 32 |

| | |
|---|-----------|
| 18. SIGNS | 32 |
| 19. TIME | 32 |
| 20. PRE CONSTRUCTION & CONSTRUCTION SCHEDULE | 33 |
| 21. DELAYS AND TIME EXTENSIONS | 33 |
| 22. LIQUIDATED DAMAGES | 34 |
| 23. DISTRICT'S RIGHT TO STOP WORK; TERMINATION OR SUSPENSION OF THE CONTRACT | 34 |
| 24. ASSIGNMENT OF CONTRACT | 35 |
| 25. COORDINATION WITH OTHER CONTRACTS | 36 |
| 26. SUBMITTALS: SHOP DRAWINGS, CUTS AND SAMPLES | 36 |
| 27. PAYMENTS | 37 |
| 28. MODIFICATIONS OF CONTRACT | 39 |
| 29. INDEMNITY | 41 |
| 30. WARRANTY OF TITLE | 41 |
| 31. USE OF COMPLETED PARTS OF THE WORK BEFORE ACCEPTANCE | 41 |
| 32. GUARANTEE & WARRANTY | 42 |
| 33. PROTECTION OF WORK AND PROPERTY | 42 |
| 34. USE OF ROADWAYS AND WALKWAYS | 43 |
| 35. MATERIALS | 43 |
| 36. SUBSTITUTIONS | 43 |
| 37. TESTING | 44 |

| | |
|--|-----------|
| 38. INSPECTION | 44 |
| 39. CLEANUP | 44 |
| 40. CONSRUCTION WASTE MANAGEMENT | 45 |
| 41. INSTRUCTIONS AND MANUALS | 47 |
| 42. AS-BUILT DRAWINGS | 48 |
| 43. SUBSTITUTION OF SECURITIES | 48 |
| 44. NO DISCRIMINATION | 48 |
| 45. LABOR STANDARDS | 49 |
| 46. GENERAL RATE OF PER DIEM WAGES | 49 |
| 47. RECORD KEEPING | 50 |
| 48. PROJECT COMPLETION | 51 |
| 49. TRENCHING OR OTHER EXCAVATIONS | 51 |
| 50. RESOLUTION OF CONSTRUCTION CLAIMS | 53 |
| 51. DISABLED VETERANS PARTICIPATION GOALS (APPLIES TO K-12 DISTRICTS ONLY.) | 54 |
| 52. RETENTION OF DVBE RECORDS (APPLIES TO K-12 DISTRICTS ONLY.) | 55 |
| 53. FINGERPRINTING (APPLIES TO K-12 DISTRICTS ONLY.) | 55 |
| 55. DRUG-FREE WORKPLACE CERTIFICATION | 56 |
| 56. PROVISIONS REQUIRED BY LAW DEEMED INSERTED | 56 |
| 57. GENERAL PROVISIONS | 57 |

1. DEFINITIONS

Addendum: A written change or revision to the Contract Documents issued to the prospective proposers prior to the time of receiving proposals.

Alternate: The sum to be added to or deducted from the base proposal if the change in scope of work as described in Alternates is accepted by the District.

Approved: Approved by the District or the District's authorized representative unless otherwise indicated in the Contract Documents.

Architect: The person or firm holding a valid license to practice architecture or engineering which has been designated (if any designated) to provide architectural or engineering design services on this Project. When Architect is referred to within the Contract Documents and no architect or engineer has in fact been designated, then the matter shall be referred to the District Superintendent or its designer.

As Directed: As directed by the District or its Architect, unless otherwise indicated in the Contract Documents.

As Selected: As selected by the District or its Architect, unless otherwise indicated in the Contract Documents.

Construction Manager: The individual or entity named as such by the District. If no Construction Manager is designated for the project, all references to the Construction Manager in these Contract Documents shall mean the District and/or its designee.

Contract: The legally binding agreement between the District and the ESCO wherein the ESCO agrees to furnish the labor, materials, equipment, and appurtenances required to perform the work described in the Contract Documents and the District agrees to pay the ESCO for such work.

Contract Documents: The Contract Documents are described in the Contract for this Project.

District and/or Owner: The District, its governing board, authorized officers and employees, and authorized representatives.

DSA: The State of California Division of the State Architect which has the authority to review, approve and inspect the safety of design, alteration and construction of school buildings.

DSA Pre-Check (PC) Approved: An "over-the-counter" design of a structure that is pre-approved by the DSA.

ESCO: The person or entity holding a valid license in the State of California required for performing this Project and who has contracted with the District to perform the construction work described in the Contract Documents. The term ESCO shall be construed to mean all of the officers, employees, Sub-contractors, suppliers, or other persons engaged by the ESCO for the work of this Project.

Final Completion: Final Completion is achieved when the ESCO has fully completed all Contract Document requirements, including, but not limited to, all final punch list items, to the District's satisfaction.

Furnish: Purchase and deliver to site of installation.

Governing Board: The governing board of the District.

Inspector: The person engaged by the District, pursuant to Section 17311 of the Education Code, to inspect the workmanship, materials, and manner of construction of buildings or portions of buildings to determine if such construction complies with the Contract Documents and applicable codes and regulations.

Indicated (or) As Shown: Shown on drawings and/or as specified.

Install: Fix in place, for materials; and fix in place and connect, for equipment.

Modification: An authorized change to the Contract Documents which may or may not include a change in contract price and/or time.

Project: The total construction work and activities described in these Contract Documents.

Project Manager: Redwood Coast Energy Authority (RCEA)

Proposal: The properly completed and signed proposal to perform the construction work for the Project as described in the Contract Documents.

Secure: Obtain.

Sub-contractor: A person, firm, or corporation duly licensed in the State of California who has a contract with the ESCO to furnish labor, materials and equipment, and/or to install materials and equipment for work in this Contract.

2. Project Manager

a. Role and Responsibilities

The Project Manager is responsible for the general oversight of all the working drawings, technical Specifications, sketches and other information necessary to define the work covered by these Contract Documents as generated by the ESCO. The Project Manager shall visit, inspect and observe the construction to determine general compliance with the Contract Documents. The Project Manager shall evaluate the shop drawings, samples and other submittals required in the technical Specifications, and maintain an up-to-date log of all such items processed. The Project Manager will consult with the District, ESCO, and any state, county or city agency having jurisdiction over the work whenever necessary to further the best interests of the Project.

b. Disputes

Should any dispute arise respecting interpretation of the drawings and Specifications, the value of any work done or of any work omitted, or of any extra work which ESCO may be required to do, or respecting the size of any payment to ESCO during the performance of this Contract, the dispute shall be decided by the Project Manager, and the Project Manager's decision shall be final and conclusive.

3. CONTRACT DOCUMENTS

a. Contents and Precedence

The Contract Documents consist of the executed Contract and all Addenda, all approved change orders, the completed Request for Proposals Form, the required Bonds and the Insurance forms, the Request for Proposals, the Notice of Award, the Notice to Proceed, the General Conditions, any supplemental Conditions, the Technical Specifications, and the Drawings. The Contract Documents are complementary and anything required by one shall be as binding as if required by all. In case of conflicts within the Contract Documents, the order of precedence of interpretation shall be as listed above, with the executed Contract and any change order thereto having priority, and subsequent Addenda having priority over prior Addenda only to the extent modified by the subsequent Addenda. In case of conflict within the drawings, larger scale drawings shall govern smaller scale drawings, and written dimensions shall govern over scaled dimensions.

b. Ambiguities, Errors, and Inconsistencies

If, in the opinion of the ESCO, the construction details indicated on the drawings or otherwise specified are in conflict with accepted industry standards for quality construction and therefore might interfere with its full guarantee of the work involved, the ESCO shall promptly bring this information to the attention of the Project Manager for appropriate action before submittal of the proposal. ESCO's failure to request clarification or interpretation of an apparent ambiguity, error or inconsistency waives that ESCO's right to thereafter claim any entitlement to additional compensation based upon an ambiguity, inconsistency, or error, which should have been discovered by a reasonably prudent ESCO, subject to the limitations of Public Contract Code §1104. During the Project, should any discrepancy appear or any misunderstanding arise as to the import of anything contained in the Contract Documents, the matter shall be promptly referred to the Architect, who will issue instructions or corrections.

c. Lines and Planes

All lines and planes appearing on contract drawings to be horizontal or vertical and not explicitly indicated otherwise shall be constructed true and plumb. All lines and planes appearing on contract drawings to intersect at right angles and not explicitly indicated otherwise shall be constructed at true right angles. Where details are indicated covering specific conditions, such details also apply to all similar conditions not specifically indicated.

d. Standards

The specification standards of the various sections of the Specifications shall be the procedural, performance, and material standards of the applicable association publications identified and shall be the required level of installation, materials, workmanship, and performance for the applicable work. Except where a specific date of issue is mentioned hereinafter, references to specification standards shall mean the edition, including amendments and supplements, in effect on the date of the Request for Proposals. Where no standard is identified and a manufacturer is specified, the manufacturer's specifications are the standards. All standards shall be subordinate to the requirements of the applicable codes and regulations.

e. Reference to the Singular

Wherever in the Specifications an article, device or piece of equipment is referred to in the singular number, such reference shall include as many such items as are shown on Drawings or required to complete the installation.

4. INTENT OF DRAWINGS AND SPECIFICATIONS

- a. Drawings and Specifications are to be read as an integrated document. The ESCO shall promptly report to the Project Manager any ambiguities, discrepancies, or errors which come to the ESCO's attention.
- b. Figured dimensions shall be followed in preference to scaled dimensions, and the ESCO shall make all additional measurements necessary for the work and shall be responsible for their accuracy. Before ordering any material or doing any work, the ESCO shall verify all measurements at the Project site and shall be responsible for the correctness of same.
- c. It is the intent of the drawings and Specifications to show and describe complete installations. Items shown but not specified, or specified but not shown, shall be included unless specifically omitted.
 - 1). The Specifications shall be deemed to include and require everything necessary and reasonably incidental to the completion of all work described and indicated on the drawings, whether particularly mentioned or shown, or not.

5. TRADE DIVISIONS

Segregation of the Specifications into the designated trade divisions is only for the purpose of facilitating descriptions and shall not be considered as limiting the work of any subcontract or trade. Subject to other necessary provisions set forth in the Specifications, the terms and conditions of such limitations or inclusions shall lie solely between the ESCO and its Sub-contractors. "Scope" as indicated in each section of the Specifications shall serve only as a general guide to what is included in that section. Neither the stated description nor the division of the plans and Specifications to various sections, which is done solely for convenience, shall be deemed to limit the work required, divide or indicate it by labor jurisdiction or trade practice, or set up any bidding barriers to the various Sub-contractors or suppliers.

- a. The ESCO shall be responsible for the proper execution of all work required by the Contract Documents and for allocating such portions as the ESCO sees fit to the various Sub-contractors, subject to applicable law. The ESCO is cautioned that the various individual sections may not contain all work that the ESCO may wish to allocate to a particular Sub-contractor or everything bearing on the work of a particular trade, some of which may appear in other portions of the plans or Specifications.
- b. If the ESCO elects to enter into any subcontract for any section of the work the ESCO assumes all responsibility for ascertaining that the Sub-contractor for the work is competent, licensed, solvent, thoroughly acquainted with all conditions and legal requirements of the work, has included all materials and appurtenances in connection therewith in the subcontract, and has performed its work in strict compliance with the Contract Documents.
- c. It shall be the responsibility of the ESCO to notify each prospective Sub-contractor at the time of request for proposals of all portions of the Contract Documents, including the General Conditions, Supplementary Conditions and any parts of sections of Specifications or plans that the ESCO intends to include as part of the subcontract.

6. MASTER MANDATORY PROVISIONS

- a. Any material, item, or piece of equipment mentioned, listed or indicated without definition of quality, shall be consistent with the quality of adjacent or related materials, items, or pieces of equipment on the Project.
- b. Any method of installation, finish, or workmanship of an operation called for, without definition of standard of workmanship, shall be followed or performed and finished in accordance with best practices and consistent with adjacent or related installations on the Project.
- c. Any necessary material, item, piece of equipment or operation not called for but reasonably implied as necessary for proper completion of the work shall be furnished, installed or performed and finished; and shall be consistent with adjacent or related materials, items, or pieces of equipment on the Project, and in accordance with best practices.
- d. Names or numbered products are to be used according to the manufacturers' directions or recommendations unless otherwise specified.

7. ESCO

- a. The ESCO shall perform all the work and activities required by the Contract Documents and furnish all labor, materials, equipment, tools and appurtenances necessary to perform the work and complete it to the District's satisfaction within the time specified. The ESCO shall at all times perform the work of this Contract in a competent and workmanlike manner and, if not specifically stated, accomplish the work according to the best standards of construction practice. The ESCO in no way is relieved of any responsibility by the activities of the architect, engineer, inspector or DSA in the performance of such duties.
- b. The ESCO shall employ a full-time competent superintendent and necessary assistants who shall have complete authority to act for the ESCO on all matters pertaining to the work. The superintendent shall be satisfactory to the District and, if not satisfactory, shall be replaced by the ESCO with one that is acceptable. Also, the superintendent shall not be changed without the written consent of the District unless the superintendent ceases to be employed by the ESCO.
- c. ESCO shall make the layout of lines and elevations and shall be responsible for the accuracy of both the ESCO's and the Sub-contractors' work resulting therefrom. All dimensions affecting proper fabrication and installation of all Contract work must be verified by the ESCO prior to fabrication and installation by taking field measurements of the true conditions. The ESCO shall take, and assist Sub-contractors in taking, all field dimensions required in performance of the work, and shall verify all dimensions and conditions on the site. If there are any discrepancies between dimensions in drawings and existing conditions which will affect the work, the ESCO shall promptly bring such discrepancies to the attention of the Project Manager for adjustment before proceeding with the work. ESCO shall be responsible for the proper fitting of all work and for the coordination of all trades, Sub-contractors and persons engaged upon this Contract.
- d. ESCO shall do all cutting, fitting, or patching of ESCO's work that may be required to make its several parts come together properly and fit it to receive or be received by work of other ESCOs as shown, or reasonably implied by, the drawings and Specifications for the completed work. Any cost incurred by the District due to defective or ill-timed work shall be borne by the ESCO.

8. RESPONSIBILITY OF ESCO

- a. ESCO shall be held strictly responsible for the proper performance of all work covered by the Contract Documents, including all work performed by Sub-contractors. All work performed under this Contract shall comply in every respect to the rules and regulations of all agencies having jurisdiction over the Project or any part thereof.
- b. ESCO shall submit Verified Reports as defined in Sections 4-336 and 4-343 (c), Group 1, Chapter 4, Part I, Title 24, California Code of Regulations (“CCR”). The duties of the ESCO are as defined in Section 4-343, Group 1, Chapter 4, Part I, Title 24, of the CCR. ESCO shall keep and make available a copy of Title 24 of the CCR at the job site at all times.
- c. Where, because of short supply, any item of fabricated materials and/or equipment, indicated on drawings or specified, is unobtainable and it becomes necessary, with the consent of the Architect, to substitute equivalent items differing in details or design, the ESCO shall promptly submit complete drawings and details indicating the necessary modifications of the work. This provision shall be governed by the terms of the General Conditions regarding Submittals: Shop Drawings, Cuts and Samples.
- d. With respect to work performed at and near a school site, ESCO shall at all times take all appropriate measures to ensure the security and safety of students and staff, including, but not limited to, ensuring that all of ESCO’s employees, Sub-contractors, and suppliers entering school property strictly adhere to all applicable District policies and procedures, e.g., sign-in requirements, visitor badges, and access limitations.

9. SUB-CONTRACTORS

- a. Nothing contained in the Contract Documents shall create any contractual relationship between any Sub-contractor and the District. The District shall be deemed to be the third party beneficiary of the contract between the ESCO and each Sub-contractor. If the ESCO does not specify a Sub-contractor for any portion of the work to be performed under this Contract, as required by law, ESCO shall perform that portion of the work with its own forces. The ESCO shall not substitute any other person or firm as a Sub-contractor for those listed in the proposal submitted by the ESCO, without the written approval of the District and in conformance with the requirements of the Public Contract Code. The District reserves the right of approval of all Sub-contractors proposed for use on this Project, and to this end, may require financial, performance, and such additional information as is needed to secure this approval. If a Sub-contractor is not approved, the ESCO shall promptly submit another firm of the same trade for approval.
- b. The ESCO shall insert appropriate provisions in all subcontracts pertaining to work on this Project requiring the Sub-contractors to be bound by all applicable terms of the Contract Documents. The ESCO shall be as fully responsible for the acts and omissions of the Sub-contractors, and of persons either directly or indirectly employed by them, as the ESCO is for the acts and omissions of persons directly employed by the ESCO.

10. PERFORMANCE AND PAYMENT BONDS

- a. As directed in the Notice of Award, the ESCO shall file with the District the following bonds, using the bond forms provided with these Contract Documents:

1) A corporate surety bond, in a sum not less than 100 percent of the amount of the Contract, to guarantee the faithful performance of the Contract, substantially in form of Attachment No. 1, attached hereto.

2) A corporate surety bond, in a sum not less than 100 percent of the amount of the Contract, to guarantee the payment of wages for services engaged and of bills contracted for materials, supplies, and equipment used in the performance of the Contract, substantially in the form of Attachment No.2, attached hereto.

b. Corporate sureties on these bonds and on bonds accompanying proposals must be admitted sureties as defined by law, legally authorized to engage in the business of furnishing surety bonds in the State of California. All sureties and bond forms must be satisfactory to the District. Failure to submit the required bonds within the time specified by the Notice of Award, using the forms provided by the District, may result in cancellation of the award of Contract.

c. The amount of the Contract, as used to determine the amounts of the bonds, shall be the total amount fixed in the ESCO's proposal for the performance of the required work.

d. During the period covered by the Contract, if any of the sureties upon the bonds shall become insolvent or unable, in the opinion of the District, to pay promptly the amount of such bonds to the extent to which surety might be liable, the ESCO, within thirty (30) days after notice given by the District to the ESCO, shall provide supplemental bonds or otherwise substitute another and sufficient surety approved by the District in place of the surety becoming insolvent or unable to pay. If the ESCO fails within such thirty (30) day period to substitute another and sufficient surety, the ESCO shall, if the District so elects, be deemed to be in default in the performance of its obligations hereunder, and the District, in addition to any and all other remedies, may terminate the Contract or bring any proper suit or other proceedings against the ESCO and the sureties or any of them, or may deduct from any monies then due or which thereafter may become due to the ESCO under the Contract, the amount for which the surety, insolvent or unable to pay, shall have been liable on the bonds, and the monies so deducted shall be held by the District as collateral security for the performance of the conditions of the bonds.

11. INSURANCE

a. ESCO shall obtain the following insurance from a company or companies acceptable to the District. All required insurance must be written by a company licensed to do business in the State of California at the time the policy is issued. All required insurance shall be equal to or exceed an A VIII rating as listed in Best's Insurance Guides' latest edition. On a case-by-case basis, the District may accept insurance written by a company listed on the State of California Department of Insurance List of Eligible Surplus Lines ("LESLI List") with a rating of A VIII or above as listed in Best's Insurance Guides' latest edition. Required documentation of such insurance shall be furnished to the District within the time stated in the Notice of Award. ESCO shall not commence work nor shall it allow its employees or Sub-contractors or anyone to commence work until all insurance required hereunder has been submitted and approved in writing by the District and a notice to proceed has been issued.

b. ESCO shall take out and maintain at all times during the life of this Contract, up to the date of acceptance of the work by the District, the following policies of insurance:

1). Public Liability Insurance: Personal injury and replacement value property damage insurance for all activities of the ESCO and its Sub-contractors arising out of or in connection with this Contract, written on a comprehensive general liability form including

ESCO's protected coverage, blanket contractual, completed operations, vehicle coverage and employer's non-ownership liability coverage, in an amount no less than \$2,000,000 combined single limit personal injury and property damage for each occurrence, and a general aggregate limit which applies either separately or specifically to this Contract and is twice the required occurrence limit, i.e., \$4,000,000.

2). Builders' Risk Insurance: ESCO shall procure and maintain builders' risk insurance (all-risk coverage) for an amount equal to one hundred percent of the Contract sum for the benefit of the District, and the ESCO and Sub-contractors as their interest may appear. In projects involving no structural change or building construction, this requirement may be waived in writing, at the District's sole option.

These policies shall include the following coverage:

1). The inclusion of more than one insured shall not operate to impair the rights of one insured against another insured and the coverages afforded shall apply as though separate policies have been issued to each insured.

2). This policy does not exclude explosion, collapse, underground excavation hazard, or removal of lateral support.

c. Endorsements:

1). The Public Liability Policy specified above shall be endorsed with the following specific language:

“The Ferndale Unified School District is named as an additional insured for all liability arising out of the operations by or on behalf of the named insured, and this policy protects the additional insured, its officers, agents and employees against liability for bodily injuries, death or property damage or destruction arising in any respect directly or indirectly in the performance of the Contract.”

2) The certificates must state that the insurance is under an occurrence based, and not a claims-made policy (policies). Both the Public Liability Policy and the Builders' Risk Policy specified above shall be endorsed with the following specific language:

i. The insurance provided herein is primary and no insurance held or owned by the District shall be called upon to contribute to a loss.

ii. Coverage provided by this policy shall not be reduced or canceled without thirty (30) days written notice given to the District by certified mail.

d. Professional Liability Insurance For Engineer of Record (Errors and Omissions):

ESCO shall maintain in force for the period covered by this Agreement, professional liability (errors and omissions) insurance covering the Engineer of Record's activities, in the amount not less than \$2,000,000 with an insurance carrier satisfactory to District. In addition, to the extent that the activities and services of engineers or consultants retained by ESCO are not covered under ESCO's professional liability insurance, ESCO shall require each engineer and consultant to obtain and maintain a policy of professional liability insurance in an amount of not less than \$2,000,000 with an insurance carrier satisfactory to District, before commencing services on the Project. ESCO shall provide a copy of the insurance policies to the District upon request.

e. Automobile Liability Insurance:

ESCO shall maintain in force for the period covered by this Agreement, automobile liability insurance covering bodily injury and property damage in an amount no less than \$1,000,000 combined single limit for each occurrence; \$2,000,000 aggregate. Said insurance shall include coverage for owned, hired, rented, and non-owned vehicles. All certificates must state that the insurance is under an occurrence based, and not a claims-made policy (policies).

f. Documentation:

Within ten (10) calendar days following issuance of the Notice of Award of the Contract, the following documentation of insurance shall be submitted to the District for approval prior to issuance of the Notice to Proceed: signed certificates of insurance showing the limits of insurance provided and copies of the specified endorsements for each policy. Certified copies of all policies shall be provided to the District upon request.

g.

If the ESCO fails to maintain such insurance, the District may take out such insurance to cover any damages for which the District might be held liable on account of the ESCO's failure to pay such damages, and deduct and retain the amount of the premiums from any sums due the ESCO under the Contract.

h. Workers' Compensation Insurance:

1). Within ten (10) calendar days following issuance of the Notice of Award of the Contract, the ESCO shall furnish to the District satisfactory proof that the ESCO and all Sub-contractors it intends to employ have procured, for the period covered by the Contract, full Workers' Compensation insurance and employer's liability with limits of at least \$1,000,000 with an insurance carrier satisfactory to the District for all persons whom the ESCO may employ in carrying out the work contemplated under this Contract in accordance with the Workers' Compensation Insurance and Safety Act, approved May 26, 1913, and all acts amendatory or supplemental thereto (the "Act"). Such insurance shall be maintained in full force and effect during the period covered by the Contract. In the event the ESCO is self-insured, ESCO shall furnish a Certificate of Permission to Self-Insure, signed by the Department of Industrial Relations Administration of Self-Insurance, Sacramento, California.

2). If the ESCO fails to maintain such insurance, the District may take out worker's compensation insurance to cover any compensation which the District might be liable to pay under the provisions of the Act, by reason of any employee of the ESCO being injured or killed, and deduct and retain the amount of the premiums for such insurance from any sums due the ESCO under the Contract, or otherwise recover that amount from the ESCO or the Surety.

3). If an injury occurs to any employee of the ESCO for which the employee, or the employee's dependents in the event of the employee's death, is entitled to compensation under the provisions of the Act, or for which compensation is claimed from the District, the District may retain from the sums due the ESCO under this Contract an amount sufficient to cover such compensation, as fixed by the Act, until such compensation is paid, or until it is

determined that no compensation is due, and if the District is compelled to pay such compensation, it will deduct and retain from such sums the amount so paid, or otherwise recover this sum from the ESCO or its Surety.

4). The policies represented by the certificates must contain the provision (and the certificates must so state) that the insurance cannot be canceled until thirty (30) days after written notice of intended cancellation has been given to the District by certified mail.

12. CODES AND REGULATIONS

a. The ESCO shall be knowledgeable regarding and shall comply with applicable portions of California Code of Regulations Title 24, the applicable Building Code, and all other codes, ordinances, regulations or orders of properly constituted authority having jurisdiction over the work of this Project. The ESCO shall examine the Contract Documents for compliance with these codes and regulations, and shall promptly notify the Project Manager of any discrepancies.

b. All work and materials shall be in full accordance with the latest rules and regulations of the Safety Orders of the Division of Industrial Safety, the National Electric Code, the Uniform Plumbing Code published by the Western Plumbing Officials Association, and other applicable State laws or regulations. Nothing in the Project plans or Specifications is to be construed to permit work not conforming to the applicable Codes. Buildings and/or all other construction covered by this Contract shall meet all the regulations for access by the physically handicapped as administered by the Division of the State Architect, and as may be required by federal or state law.

c. If the work under this Contract is for the construction of a school building as defined by the Education Code, then the following provisions shall apply to the Contract:

1). All work shall be executed in accordance with the current requirements of Sections 17280 et seq. or Sections 81130 of the Education Code and California Code of Regulations: Title 24 and Title 19. No deviations from the approved plans and Specifications will be permitted except upon a Change Order or Addenda, signed by the District and Architect and approved by the Division of the State Architect and the State Fire Marshal, if applicable.

2). Prior to the start of construction, District shall employ a Project Inspector, approved by the Division of the State Architect, to provide inspection services as defined in Title 24, California Code of Regulations and pursuant to Section 17311 of the Education Code. The Owner shall pay for the costs of the project inspection services, except as indicated in the General Conditions, Article 38 and the plans and Specifications. A copy of current California Code of Regulations Title 24, approved sets of plans and Specifications, addenda and change orders, shall be kept by the School District Job Inspector on the job at all times during construction. Division of the State Architect shall be notified 48 hours in advance of the first pour of concrete.

13. PERMITS AND TAXES

a. The ESCO shall obtain and pay for all permits, fees and licenses that are required in order to perform the work under this Contract. The District shall pay connection charges and meter costs for new permanent utilities required by these Contract Documents. The ESCO shall notify the District sufficiently in advance to submit requests for service to the appropriate utility companies so as to insure connections or installation of utility services in accordance with the Project schedule.

b. The ESCO shall pay for all taxes on materials and equipment. The District is exempt from Federal Excise Tax. ESCO shall not pay Federal Excise Tax on any item in this Contract.

14. PATENTS AND ROYALTIES

All fees or claims for patents, royalties or licenses on materials, equipment or processes used in the performance of work on this Project shall be included in the amount of the proposal. The ESCO shall indemnify, defend, and hold harmless the District, its Governing Board, the Architect, and their officers and employees, from all claims or liability, including costs and expenses, which may arise from the use on this Project of any patented or copyrighted materials, equipment, or processes.

15. SAFETY AND FIRE PREVENTION

a. The ESCO, Sub-contractors and all of their agents and employees shall fully comply with all of the provisions and requirements of CAL/OSHA, Title 8, California Code of Regulations, and all other safety codes applicable to the Project. The ESCO shall take thorough precautions at all times for the protection of persons and property, and shall be liable for all damages to persons or property, either on or off the site, which occur as a result of ESCO's prosecution of the work. The ESCO shall obtain permits for, install and maintain in safe condition barricades, walkways, fences, railings, and whatever other safeguards that may be necessary to protect persons and property from damage as a result of the construction under this Contract.

b. ESCO is required to ensure Material Safety Data Sheets ("MSDS") are available in a readily accessible place at the work site for any material requiring a MSDS pursuant to the federal "Hazard Communication" standard or employee "right to know" laws. ESCO is also required to ensure proper labeling on materials brought on the job site such that any person working with the material or within the general area of the material is informed of the hazards of the material and follows proper handling and protection procedures. A copy of the MSDS shall also be promptly submitted directly to the District.

c. ESCO shall not endanger any work by cutting, excavating, or otherwise altering the work and shall not cut or alter the work of any other ESCO except with the written consent of the Architect, nor overload any new or existing structures by the placing or storage of materials, equipment, or other items thereon, and, if necessary, shall provide calculations proving the safety in so doing.

d. If it is necessary to work at night, or where daylight is obscured, the ESCO shall provide and maintain lighting of an adequate level to properly prosecute the work, to permit the thorough inspection of same, and to ensure the safety to workers and others.

e. ESCO shall take extraordinary care to prevent fires and keep all flammable materials and oily rags in tightly closed metal containers. ESCO shall exercise particular care when welding or cutting, and with regard to the disposition of waste materials, the nature and quantity of which might create or increase a fire hazard.

16. HAZARDOUS MATERIALS

Unless otherwise specified, this Contract does not include the removal, handling, or disturbance of any hazardous substances or materials encountered in the new construction or on the Project grounds. If such substances or materials are encountered, work shall cease in that area and the

District shall be promptly notified to take appropriate action for removal or otherwise abating the condition in accordance with current regulations applicable to the District.

a. General

- 1). No asbestos, asbestos-containing products or other hazardous materials shall be used in this construction or in any tools, devices, clothing or equipment used to further this construction.
- 2). Asbestos and/or asbestos containing products shall be defined as all items containing but not limited to chrysotile, crocidolite, amosite, anthophyllite, tremo-lite or actinolite.
- 3). Any or all material containing greater than one tenth of one percent (>.1%) asbestos shall be defined as asbestos-containing material.
- 4). Any disputes involving the question of whether or not material contains asbestos shall be settled by electron microscopy; the cost of any such tests shall be paid by the ESCO.
- 5). All work or materials found to contain asbestos or work or material installed with asbestos containing equipment will be immediately rejected and this work shall be removed by the ESCO at no additional cost to the District.

b. Decontamination and Removal of hazardous material from prior work

- 1). Decontamination and removal of work found to contain asbestos or work installed with asbestos containing equipment shall be done only under the supervision of a qualified consultant, knowledgeable in the field of asbestos abatement and accredited by the Environmental Protection Agency ("EPA").
- 2). The asbestos removal ESCO shall be an EPA-accredited ESCO qualified in the removal of asbestos subject to approval of the District. 3) The asbestos consultant shall be chosen and approved by the District which shall have sole discretion and final determination in this matter.
- 4). The work will not be accepted until asbestos contamination is reduced to levels deemed acceptable by the asbestos consultant.

c. Hold Harmless

- 1). Interface of work under this contract with work containing asbestos shall be executed by the ESCO at ESCO's risk and at ESCO's discretion with full knowledge of the currently accepted standards, hazards, risks and liabilities associated with asbestos work and asbestos containing products. By execution of this contract the ESCO acknowledges the above and agrees to hold harmless, as set forth in the indemnity provisions of this Contract, the Owner, its employees, agents and assigns for all asbestos liability which may be associated with this work and agrees to instruct ESCO's employees and agents with respect to the above mentioned standards, hazards, risks and liabilities.
- 2). The ESCO shall, prior to commencement of this work, provide a duly signed and notarized affidavit that ESCO has instructed ESCO's employees and agents with respect to the above mentioned standards, hazards, risks and liabilities and the contents and requirements of this portion of the Contract Documents.

d. Certification

The ESCO agrees that materials containing asbestos or other hazardous materials as defined in Federal and State law shall not be used in construction.

17. TEMPORARY FACILITIES

- a. The ESCO shall obtain permits for, install and maintain in safe condition all scaffolds, hoisting equipment, barricades, walkways, or other temporary structures that may be required to accomplish the work. Such structures shall be adequate for the intended use and capable of safely accepting all loads that may be imposed upon them. They shall be installed and maintained in accordance with all applicable codes and regulations.
- b. The ESCO shall provide and maintain temporary heat from an approved source whenever in the course of the work it may become necessary for curing, drying or warming spaces as may be required for the proper installation of materials or finishes. The ESCO shall provide and maintain any and all facilities that may be required for dewatering in order that work may proceed on the project. If it is necessary for dewatering to occur continually, the ESCO shall have on hand whatever spare parts or equipment that may be required to avoid interruption of service or work.
- c. The ESCO shall promptly remove all such temporary facilities when they are no longer needed for the work or on completion of the project. The ESCO shall repair any damage to premises or property which resulted from the construction, use, or removal of temporary facilities and shall restore the premises and property to their original condition.
- d. See the Supplemental General Conditions and/or specifications for requirements concerning temporary sanitary facilities and utilities.

18. SIGNS

No signs may be displayed on or about the District's property (except those which may be required by law) without the District's prior written approval of size, content and location. Any signs required by the District will be designated in the Supplemental General Conditions.

19. TIME

- a. The ESCO shall commence the work on the date indicated in the Notice to Proceed. Time is of the essence regarding the Contract work, and the ESCO shall prosecute the work diligently and regularly at such a rate of progress as to ensure completion of this Project within, or sooner than, the time specified.
- b. The ESCOs and Sub-contractors shall investigate and become aware of the amount of time required for the delivery of all equipment and materials required to perform the work under this Contract, and no extension of time shall be granted due to failure to order the equipment and materials sufficiently before their incorporation into the work so as to avoid delay to the Project.
- c. The ESCO and Sub-contractors shall provide and maintain enough manpower, materials and equipment to ensure a rate of construction progress that will complete the Project within or sooner than the time specified and according to the schedule of work. If, in the District's opinion, the ESCO and/or Sub-contractors are not prosecuting the work at a sufficient rate of progress to meet the Project schedule, the District may direct the ESCO to provide additional manpower, materials or equipment, or to work additional hours, holidays or weekends without

additional cost to the District until the work is progressing in a manner satisfactory to the District. Failure to prosecute the work in a timely manner according to the Project schedule is considered a breach of Contract and shall be cause for termination of the Contract.

20. PRE CONSTRUCTION & CONSTRUCTION SCHEDULE

- a. Within fifteen (15) calendar days after the Award of Contract, the ESCO shall prepare and submit to the Architect and District an as planned construction schedule showing in detail how the ESCO plans to prosecute the work within the time set for Final Completion. The schedule shall include the work of all trades necessary for construction of the Project, and shall be sufficiently complete and comprehensive to enable progress to be monitored on a day-by-day basis. The information for each activity shall include at a minimum the activity description, duration, start date and completion date.
- b. The ESCO shall take care in the preparation of the schedule to ensure that it represents an accurate and efficient plan for accomplishing the work. If the Project is more than one week behind schedule, it must be promptly revised showing how the ESCO plans to complete the work, but in no case shall it show a completion date later than that required by the Contract, unless a time extension has been granted. The current schedule shall be kept posted in the ESCO's project office on site.
- c. The ESCO shall be responsible for the coordination of all work necessary and pertaining to the construction whether actually a part of this Contract or attendant thereto. The ESCO shall notify the District and various utility companies, as far as possible in advance of their required work, in order that work schedules may be developed for all concerned, which will permit the most effective and timely accomplishment of the entire project.

21. DELAYS AND TIME EXTENSIONS

- a. The ESCO may be granted a time extension if the ESCO encounters an unavoidable delay of the work due to causes completely beyond the ESCO's control and which the ESCO could not have avoided by the exercise of reasonable care, prudence, foresight and diligence. Causes for which a claim for extension of time may be made include: acts of the public enemy, acts of another ESCO in the performance of another contract with the District, priority of a governmental agency for materials or equipment, fire, flood, violent wind storm, epidemic, quarantine restriction, strike, freight embargo, or weather of an unusually severe nature. The ESCO will not be granted time extensions for weather conditions which are normal for the location of the Project, according to the U. S. Weather Bureau Records.
- b. A request for extension of time and compensation related thereto shall be made in writing to the Project Manager and District within ten (10) calendar days of the date the delay is encountered, or shall be deemed waived. The request shall include a detailed description of the reasons for the delay and corrective measures by the ESCO. The request shall be accompanied by evidence that the insurance policies required by the Contract shall be in effect during the requested additional period of time. In order for the Project Manager to consider a request for time extension, the ESCO must prove that the reasons stated for the delay actually caused a delay in portions of the work which will result in completion beyond the date specified in the Contract. The ESCO may also be granted a time extension for a significant change in the scope of work which request for extension of time shall be included in a Contract modification proposal.

c. No damages or compensation or any kind shall be paid to an ESCO because of delays in the progress of work, whether such delays be avoidable or unavoidable, that are not the responsibility of District. District's liability to ESCO for delays for which District is responsible shall be limited to an extension of time unless such delays were unreasonable under the circumstances involved and were not within the contemplation of the parties when the Contract was awarded. The ESCO shall provide to the District the actual, substantiated costs to ESCO for which the ESCO may claim damages from District. Such costs, if any, shall be directly related to the Project, and shall not include costs that would be borne by the ESCO in the regular course of business, including, but not limited to, office overhead and ongoing insurance costs. Delay damages shall not include ESCO or Sub-contractor markup for overhead and profit, but only actual, documented, and direct actual costs. The District shall not be liable for any damages which the ESCO could have avoided by any reasonable means including, but not limited to, the more judicious handling of forces or equipment.

d. The granting of an extension of time because of unavoidable delays shall in no way operate as a waiver on the part of the District of the right to collect liquidated damages for other delays or of any other rights to which the District is entitled.

22. LIQUIDATED DAMAGES

a. Should the ESCO fail to achieve Final Completion of this Contract within the time fixed for Final Completion, together with extensions granted by the District for unavoidable delays, ESCO shall become liable to the District in the amount specified in the Contract per calendar day for each day the Contract remains incomplete beyond the time for Final Completion, as liquidated damages and not as a penalty. ESCO may also be assessed liquidated damages for failure to meet milestones specified in the Contract Documents, regardless of impact on overall Project completion. ESCO shall not be charged with liquidated damages when the delay in completion of the work beyond the time for Final Completion is due to acts of the District. It is expressly stipulated and agreed by ESCO and District that it would be impractical and extremely difficult to fix the actual amount of damages.

b. Any money due or to become due the ESCO may be retained to cover liquidated damages. Should such money not be sufficient to cover the liquidated damages, the District shall have the right to recover the balance from the ESCO or ESCO's sureties.

c. Should the District authorize suspension of the work for any cause, the time work is suspended will be added to the time for completion. Suspension of the work by the District shall not be a waiver of the right to claim liquidated damages as set forth in this section.

d. The assessment of Liquidated Damages does not otherwise limit the right of the Owner to claim a loss or damages incurred by the Owner for reasons other than delay (e.g. damages due to defective work).

23. DISTRICT'S RIGHT TO STOP WORK; TERMINATION OR SUSPENSION OF THE CONTRACT

a. District's Right to Stop Work:

In addition to or as an alternative to any and all other remedies available to the District, if the ESCO fails to correct work which is not performed in accordance with the Contract Documents, or if the ESCO persistently fails to perform the work in accordance with the Contract Documents, the District may, by written order, direct the ESCO to stop the work, or any portion

thereof, until the cause for such order has been eliminated to the satisfaction of the District. However, the right of the District to stop the work shall not give rise to a duty on the part of the District to exercise this right for the benefit of the ESCO or any other person or entity, and the failure of the District to do so shall not be raised as a defense to the ESCO's failure to perform the work in accordance with the Contract Documents.

b. Termination for Cause:

1). If the ESCO refuses or fails to furnish sufficient materials, work force, equipment, and appurtenances to properly prosecute the work in a timely manner, or if ESCO refuses or fails to comply with any provisions of the Contract Documents, or if ESCO should file a bankruptcy petition or make a general assignment for the benefit of ESCO's creditors or if a receiver should be appointed on account of ESCO's insolvency, then the District may give the ESCO and ESCO's Surety written notice of intention to terminate the Contract. Unless within seven (7) calendar days after the serving of such notice upon the ESCO and ESCO's Surety such violation shall cease and arrangements for correction of such conditions shall be made satisfactory to the District, the Contract shall cease and terminate. In the event of such termination, the District shall immediately serve written notice thereof upon the ESCO and ESCO's Surety.

2). In the event of termination for cause, in addition to all remedies available to the District, the ESCO's Surety shall have the right to take over and perform the Contract; provided, however, that if the Surety does not commence performance within five (5) calendar days from the date of the issuance of such notice of termination, the District may take over the work and prosecute the same to completion by letting another Contract, or by any other method that the District deems advisable. The ESCO and ESCO's Surety shall be liable for any excess cost incurred by the District thereby, and in any such event the District may take possession of such materials, equipment, and other property belonging to the ESCO as may be on the site and use same in completing the work.

c. Termination or Suspension for Convenience:

The District reserves the right, in its sole discretion, to terminate or suspend all or part of the Contract for convenience following three (3) days written notice to the ESCO. In the event of termination or suspension for convenience, ESCO shall have no claims against the District, except:

- 1). The actual cost of labor, materials and services provided pursuant to the Contract, and which have not yet been paid for, as documented by timesheets, invoices, receipts and the like; and
- 2). Five percent (5%) of the total cost of the work performed as of the date of notice of termination or suspension or five percent (5%) of the value of the work yet to be completed, whichever is less. The parties agree that this amount shall constitute full and fair compensation for all ESCO's lost profits and other damages resulting from the termination or suspension for convenience.

24. ASSIGNMENT OF CONTRACT

The ESCO may not assign or delegate all or any portion of this Contract without the written consent of the District and no such consent shall be given which would relieve the ESCO or its Surety of their responsibilities under the Contract. The ESCO may assign, without liability to

the District, monies due the ESCO under the Contract to banks, trust companies or other financial institutions provided written notice thereof is promptly delivered to the District. Assignment of monies earned by the ESCO shall be subject to the same retention as other payments made to ESCO, and shall also be subject to setoffs and back charges as provided by this Contract.

25. COORDINATION WITH OTHER CONTRACTS

a. The District reserves the right to do other work or award other contracts in connection with this Project. By entering into this Contract, ESCO acknowledges that there may be other ESCOs on or adjacent to the Project site whose work must be coordinated with that of its own. ESCO expressly warrants and agrees that it will cooperate with other ESCOs and will do nothing to delay, hinder, or interfere with the work of other ESCOs, or that of the District, its Architect and Construction Manager. ESCO also expressly agrees that in the event its work is hindered, delayed, interfered with, or otherwise affected by a separate ESCO, its sole remedy will be a direct action against the separate ESCO. To the extent allowed by law, the ESCO expressly waives any remedy against the District, its Architect and Construction Manager on account of delay, hindrance, interference or other such events caused by a separate ESCO.

b. If any part of ESCO's work depends upon the work of a separate ESCO, ESCO shall inspect such other work and promptly report in writing to the District and Architect any defects in such other work that render it unsuitable to receive the work of ESCO. Failure of the ESCO to so inspect and report shall constitute an acceptance of the other ESCO's work, except as to defects which the ESCO could not have detected through the reasonable inspection of the other ESCO's work prior to the execution of ESCO's work.

c. If ESCO is aware of a current or potential conflict between ESCO's work and the work of another ESCO on the site, and is unable to informally resolve the conflict directly with the other ESCO, ESCO shall promptly provide written notice to the District, with a copy to the Architect and the other ESCO, specifying the nature of the conflict, the date upon which the conflict arose, and the steps taken to attempt to resolve the conflict. The District may issue written instructions to address the conflict.

d. If, through ESCO's negligence, any other ESCO or Sub-contractor shall suffer loss or damage to the work, ESCO shall make a reasonable effort to settle with such other ESCO and Sub-contractor by agreement or arbitration. If such other ESCO or Sub-contractor shall assert any claim against the District or Architect, on account of any damage alleged to have been so sustained, the District or Architect shall notify the ESCO, who shall defend such proceedings at ESCO's own expense and save harmless and indemnify the District and the Architect from any such claim.

26. SUBMITTALS: SHOP DRAWINGS, CUTS AND SAMPLES

a. Five (5) copies of shop drawings, brochures and cuts and samples in quantities specified by the Architect shall be submitted to the Architect for all items for which they are required by the plans and Specifications. Prior to transmittal, the ESCO shall examine all submittals for accuracy and completeness in order to verify their suitability for the work and compliance with the Contract Documents and shall sign and date each submittal. Submittals shall be made sufficiently before the items are required for the work so as to cause no delay and shall be in accordance with the project construction schedule.

b. In addition to information furnished as common practice, submittals shall contain the Project name and location, ESCO's name and address, Sub-contractor's or supplier's name and address, date of submittal and any revisions, and reference to appropriate specification section, and/or drawing and detail numbers. The ESCO and/or the Sub-contractors shall verify in the field all dimensions and relationships to adjacent work necessary to ensure the proper fit of the items submitted. If necessary, the ESCO shall make any corrections required and resubmit with all due haste in the same number as initially required.

c. Review of submittals, shop drawings, cuts or samples by the District or Architect shall not relieve the ESCO from complying with the requirements of the Contract Documents.

d. Any materials or equipment installed without approval shall be at the ESCO's own risk, and ESCO may be required to remove any such materials or equipment and install the specified items at ESCO's own cost, including repairs to adjacent work.

27. PAYMENTS

a. Cost Breakdown:

Prior to submitting ESCO's first request for payment, the ESCO shall prepare and submit to the Architect and District a cost breakdown (schedule of values) showing the major work items for each trade or operation required in construction of the Project. The work items shall be sufficiently detailed to enable the Architect to accurately evaluate the completion percentages requested by the ESCO. The cost for each work item shall include overhead and profit. The total of all work item costs shall equal the amount of the Contract.

b. Scope of Payment:

Payment to the ESCO at the unit price or other price fixed in the Contract for performing the work required under any item or at the lump sum price fixed in the Contract for performing all the work required under the Contract, shall be full compensation for furnishing all labor, materials, equipment and tools necessary to the work, and for performing and completing, in accordance with the Specifications, all work required under the item or under the Contract, and for all expense incurred by the ESCO for any purpose in connection with the performance and completion of the work.

c. Progress Payments:

The ESCO will, on or about the last day of each month, make an estimate of the value of the work completed by ESCO in the performance of the Contract. These estimates shall be subject to the review and approval of the Architect. The first such estimate will be of the value of the work completed after the ESCO commenced the performance of the Contract, and every subsequent estimate, except the final estimate, will be of the value of the work completed since the immediately preceding estimate. Such estimates will be based on labor, materials and equipment incorporated into the work, and items of materials and equipment delivered to the Project. The ESCO shall be responsible for the security and protection of such materials and equipment delivered to the Project and not incorporated in the work. The Governing Board has found that the Project is substantially complex and therefore requires a retention amount of 90%. Within thirty (30) calendar days after the approval of each estimate for progress payment, the District will pay to the ESCO an amount equal to ninety (90) percent of the approved estimate. Payments may at any time be withheld if in the judgment of the District the work is not proceeding in accordance with the Contract Documents, the ESCO is not complying with the

requirements of the Contract, stop notices have been timely filed, the estimate contains an error, or the District has incurred costs or requests reasonable financial assurances regarding defective work by the ESCO.

d. Final Payment:

Within thirty (30) days after all required work is fully completed in accordance with the Contract Documents, the ESCO shall submit a final invoice for the total value of the work completed in accordance with the Contract, which shall be subject to review and approval by the District. As required by law, District shall pay ESCO the unpaid balance of the Contract price of the work, or the whole Contract price of the work if no progress payment has been made, determined in accordance with the terms of the Contract, less such sums as may be lawfully retained under any provision of the Contract, including, but not limited to, amounts retained as liquidated damages, for stop notices, for third-party claims for which the ESCO is required to indemnify the District, for defective work and costs incurred by the District in connection therewith, or for other such claims and damages attributable to the ESCO ("Final Payment"). Prior progress estimates and payments are subject to correction in the Final Payment. Tender of the Final Payment shall constitute denial by the District of any unresolved claim. ESCO's acceptance of the Final Payment shall operate as a full and final release to the District and its agents from any and all unasserted claims ESCO has, or may have, related to this Contract.

e. Payments Do Not Imply Acceptance of Work:

The granting of any progress payment or payments by the District or the receipt thereof by the ESCO shall not constitute acceptance of the work or of any portion thereof, and shall in no way lessen the liability of the ESCO to replace unsatisfactory work or material, whether or not the unsatisfactory character of such work or material was apparent or detected at the time such payment was made.

f. Retention of Sums Charged Against ESCO:

It is mutually understood and agreed that when under any provision of this Contract the District shall charge any sums of money against the ESCO, the amount of such charge shall be deducted and retained by the District from the amount of the next succeeding progress estimate, or from any other monies due or that may become due the ESCO on account of the Contract. If on completion or termination of the Contract such monies due the ESCO are found insufficient to cover the District's charges against the ESCO, the District shall have the right to recover the balance from the ESCO or the ESCO's Sureties.

g. Release:

The ESCO and each assignee under an assignment in effect at the time of Final Payment shall, if required by the District, execute and deliver at the time of Final Payment and as a condition precedent to Final Payment, a release in form and substance satisfactory to and containing such exemptions as may be found appropriate by the District, discharging the District, its officers, agents and employees of and from liabilities, obligations and claims arising under this Contract.

h. Payment to Sub-contractors and Suppliers:

The ESCO shall pay each Sub-contractor and supplier promptly on receipt of each progress payment from the District for the materials, labor and equipment delivered to the site or

incorporated in the work by each Sub-contractor during the period for which the progress payment is made, less any retention as provided above.

i. Stop Notice Costs:

The District reserves the right to charge the ESCO or Surety, or to withhold from release of retention, all costs incurred by the District, including attorney's fees, for processing and defending stop notice claims.

28. MODIFICATIONS OF CONTRACT

a. Changes in the Work:

1). The District, before the date of acceptance of the work, may, without notice to the Sureties, order changes in the work ("Modifications"), may order extra materials and extra work in connection with the performance of the Contract, and the ESCO shall promptly comply with such orders. All Modifications must be approved by DSA and the State Fire Marshall, if applicable, as required by law.

2). If changes ordered in design, workmanship or materials are of such a nature as to increase or decrease the cost of any part of the work, the price fixed in the Contract shall be increased or decreased by such amount as represents the reasonable and proper allowance for the increase or decrease in the cost of the work in accordance with the provisions of this Article, and any other applicable terms of the Contract, including, but not limited to, the ESCO's schedule of values and the price for allowances, if any. Except as provided by law, the total cost of all Modifications shall not exceed ten (10) percent of the original Contract price.

3). In the case of a disputed work item, the District may direct the ESCO to perform the disputed work at no additional cost to the District on the grounds that the work is adequately indicated in the Contract Documents, and therefore already included in the Contract price. If the ESCO maintains that the disputed work represents a modification to the Contract, ESCO may submit a claim in accordance with Article 50, Resolution of Construction Claims. Notwithstanding any dispute regarding the requirements of the Contract Documents, ESCO shall promptly and fully comply with the District's directive. ESCO's failure to do so shall be deemed a material breach of this Contract, and in addition to all other remedies, District may, at its sole discretion, hire another ESCO and/or use its own forces to complete the disputed work at ESCO's sole expense, and may deduct the cost of such work from the Contract price.

b) When the Modification is proposed, the ESCO shall furnish a complete breakdown of actual costs of both credits and extras, itemizing materials, labor, taxes, overhead and profit. Subcontract work shall be so indicated. All costs must be fully documented. The following limitations shall apply:

1). Limitations Where Contract Price Changes are Involved:

(a) Overhead and Profit for the ESCO. The ESCO's overhead and profit on the cost of subcontracts shall be a sum not exceeding ten percent (10%) of such costs. The ESCO's overhead and profit on the costs of work performed by the ESCO shall be a sum not exceeding fifteen percent (15%) of such costs. Overhead and profit shall not be applied to the cost of taxes and insurance by ESCO or Sub-contractors or to credits. No

processing or similar fees may be charged by the ESCO in connection with the Modification.

(b) Bond Premiums. The actual rate of bond premiums as paid on the total cost (including taxes) will be allowed, but with no markup for profit and overhead.

(c) Taxes. State and city sales taxes should be indicated. Federal excise tax shall not be included. (District will issue an exemption on request.)

2). Change Order Certification:

All change orders and requests for proposed change orders shall be deemed to include the following certification by the ESCO:

"The undersigned ESCO approves the foregoing as to the changes in work, if any, and as to the Contract price specified for each item and as to the extension of time allowed, if any, for completion of the Project as stated herein, and agrees to furnish all labor, materials, and service and to perform all work necessary to complete any additional work specified for the consideration stated herein. Submission of claims which have no basis in fact or which ESCO knows are false are made at the sole risk of the ESCO and may be a violation of the False Claims Act, as set forth in Government Code §§12650 et seq. It is understood that the changes to the Contract Documents set forth herein shall only be effective upon approval by the Governing Board of the District.

"It is expressly understood that the value of the extra work or changes expressly includes any and all of the ESCO's costs and expenses, both direct and indirect, resulting from additional time required on the Project or resulting from delay to the Project. Any costs, expenses, damages, or time extensions not included herein are deemed waived."

c. Unit Prices, Schedule of Values, or Allowances:

Where Unit Prices, a Schedule of Values, and/or Allowances are required by the Contract Documents, that pricing shall govern in computing any additions to or deductions from the Contract price on account of any added or omitted work. Unit Prices listed in the original proposal include all costs and no addition of any description will be allowed.

d. Time and Materials:

If it is impractical, because of the nature of the work, or for any other reason, to fix an increase in price in advance, the Change Order may fix a maximum price which shall not under any circumstances be exceeded, and subject to such limitation, such alteration, modification or extra shall be paid for at the actual necessary cost as determined by the sum of the following items (1) to (5) inclusive:

1). Labor, including premium on compensation insurance and charge for Social Security taxes, and other taxes pertaining to labor.

2). Material, including sales taxes and other taxes pertaining to materials.

3). Plant and equipment rental, to be agreed upon in writing before the work is begun. No charge for the cost of repairs to plant or equipment will be allowed.

4). Overhead and profit computed at fifteen percent (15%) of the total of Items (1) to (3) inclusive.

5). The proportionate cost of premiums on bonds computed at one and one-half percent (1-1/2%) of the total of items (1) to (4) inclusive.

If the Time and Materials work is done by a Sub-contractor, the amount shall be determined as set forth above under items (1) to (5) inclusive. The ESCO's overhead and profit on the costs of subcontracts (exclusive of taxes and insurance) shall not exceed ten percent (10%) of such costs.

The District reserves the right to furnish such materials as it may deem expedient, and no allowance will be made for profit thereon. The above-described methods of determining the payment for work and materials shall not apply to the performance of any work or the furnishing of any material which, in the judgment of the District, may properly be classified under items for which prices are established in the Contract.

e. Oral Modifications:

No oral statements of any person shall in any manner or degree modify or otherwise affect the terms of the Contract.

29. INDEMNITY

ESCO shall defend with counsel acceptable to the District, indemnify and hold harmless to the full extent permitted by law, the District and its Board of Trustees, officers, agents, Architect, construction manager, employees and volunteers from and against any and all liability, loss, damage, claims, expenses, fines, judgments and costs (including, without limitation, attorney's fees and costs and fees of litigation) (collectively, "Liability") of every nature arising out of or in connection with ESCO's performance of the Project or its failure to comply with any of its obligations contained in these Contract Documents, except such Liability caused by the active negligence, sole negligence or willful misconduct of the District. Such indemnification shall extend to all claims, demands, or liabilities occurring after completion of the project as well as during the progress of the work. Pursuant to Public Contract Code §9201, District shall timely notify ESCO of receipt of any third-party claim relating to this Project.

30. WARRANTY OF TITLE

ESCO warrants that title to all work, materials or equipment included in a request for payment shall pass and transfer to the District whether or not they are installed or incorporated in the Project, free from any claims, liens or encumbrances, when such payment is made to the ESCO. ESCO further warrants that no such work, materials or equipment have been purchased for work under the Contract subject to an agreement by which an interest therein or an encumbrance thereon is retained by the seller or supplier.

31. USE OF COMPLETED PARTS OF THE WORK BEFORE ACCEPTANCE

Whenever the work or any part thereof is in a condition suitable for use, and the best interest of the District requires such use, as determined by the District, the District may take possession of, connect to, open for public use, or use the work or a part thereof. When so used, maintenance and repairs due to ordinary wear and tear or vandalism will be made at District's expense. The use by the District of the work or part thereof as contemplated in this section shall in no case be construed as constituting acceptance of the work or any part thereof, including, but not limited to, the right to assess liquidated damages. Such use shall neither relieve the ESCO of any of ESCO's responsibilities under the Contract nor act as a waiver by the District of any of the

conditions thereof. ESCO shall continue to maintain all insurance, including Builder's Risk insurance, on the entire Project, and diligently pursue full completion of the work.

32. GUARANTEE & WARRANTY

a. By signing this Contract, ESCO agrees to the following guarantee and warranty:

We hereby guarantee and warrant our work on the Proposition 39 Energy Project for a period of ten (10) years from the date of filing of the Notice of Completion.

ESCO shall promptly repair or replace to the satisfaction of the District any or all work that appears defective in workmanship, equipment and/or materials for whatever reason, ordinary wear and tear and unusual abuse or neglect excepted, together with any other work which may be damaged or displaced in so doing. ESCO agrees to promptly correct and remedy any failure by the ESCO to conform its work, activities and services to the requirements of the Contract Documents.

In the event of the ESCO's failure to comply with the above-mentioned obligations within the ten (10) calendar days of notice, or sooner if required by an emergency, ESCO hereby authorizes the District to have the defects or deficiencies repaired, remedied, corrected and made good at ESCO's expense, and ESCO shall pay the costs and charges therefore upon demand. The Surety shall also agree to be responsible for these costs and charges as well.

33. PROTECTION OF WORK AND PROPERTY

a. The ESCO shall be responsible for each operation and all work on the Project, both permanent and temporary. The ESCO shall protect the work and materials from damage due to negligence, the action of the elements, the carelessness of third parties, vandalism, or any other cause whatsoever, until the final completion and acceptance of the Project. Should improper work by the ESCO be covered by another ESCO and damage or defects result, the whole work affected shall be made good by the ESCO to the satisfaction of the Architect and District without expense to the District. The ESCO shall take reasonable care to avoid damage to existing facilities or utilities, whether on the Project or adjacent to it, and ESCO shall be liable for any damage thereto or interruption of service due to ESCO's operations. If the ESCO encounters any facilities or utilities not shown on the drawings or not reasonably inferable therefrom, ESCO shall promptly notify the Architect about them, and shall do no further work which may cause damage to same. If it is determined that some action needs to be taken regarding facilities not shown, the ESCO will be given directives on what action to take, and any additional cost to the ESCO incurred thereby will be handled by Change Order.

b. The property limits of the area of the Project are indicated on the drawings. Except for work specifically shown or noted, ESCO shall confine ESCO's operations within the indicated property limits. The ESCO shall provide, install, and maintain all shoring, bracing and underpinning necessary to support adjacent property, streets, buildings and structures, that may be affected by building operations for this work; shall serve or cause to be served all legal notices to adjoining property owners that may be necessary for their protection; and shall protect from damage all adjacent buildings, fences, landscaping, and repair or replace any such property damaged in the course of work under the Contract.

34. USE OF ROADWAYS AND WALKWAYS

The ESCO shall not unnecessarily interfere with use of any roadway, walkway or other facility for vehicular or pedestrian traffic, by any party entitled to use it. Wherever such interference becomes necessary for the proper and convenient performance of the work and no satisfactory detour route exists, the ESCO shall, before beginning the interference, provide a satisfactory detour, temporary bridge, or other proper facility for traffic to pass around or over the interference and shall maintain it in satisfactory condition as long as the interference continues, all without extra payment unless otherwise expressly stipulated in the Contract Documents.

35. MATERIALS

a. Unless explicitly stated otherwise, all specified equipment and material comprising the work of this Contract, as being provided or furnished or installed, shall imply the inclusion of all components, hardware and accessories, required for complete installation and satisfactory operation as intended by the manufacturer. Wherever the method of installation of any material is not explicitly specified, the installation shall be as recommended by manufacturer.

b. Wherever in the Contract Documents it is provided that the ESCO shall furnish materials or equipment for which no detailed specifications are set forth, such materials or equipment shall be new and of the best grade for the purpose for which they will be used when incorporated in the work. Materials specified by reference to a number or symbol of a specific standard, such as A.S.M., Federal Specification, State Standard, Trade Association, or similar standards, shall comply with requirements in the latest revision thereof and any amendment or supplement in effect on the date of the Request for Proposals.

c. None of the materials to be provided furnished or installed on this project shall contain asbestos or any other "hazardous substance" as that term is defined by federal or state law.

36. SUBSTITUTIONS

a. Wherever in the drawings or Specifications a material or product is called for by trade or brand names or manufacturer and model number, alternative items of equal quality and purpose may be proposed for use by the ESCO. The burden of proof of equality is on the ESCO, and ESCO shall furnish all information and supplies necessary for the Architect to make a thorough evaluation of the proposed substitution. The Architect's decision about the equality of the proposed substitution is final, and if the proposed substitution is not approved, the ESCO shall install the item called for. Proposed substitutions and any changes in adjacent work caused by them shall be made by the ESCO at no additional cost to the District.

b. Proposed substitutions shall be submitted sufficiently before actual need to allow time for thorough evaluation. Substitutions shall not be proposed for the reason that submittals were not made early enough to avoid delay. Architect's review of substitutions shall not relieve the ESCO from complying with the requirements of the drawings and Specifications.

c. In the event ESCO makes substitutions in materials, equipment, or designs, with or without the District's approval, other than those authorized herein, the ESCO shall then assume full responsibility for the effects of such substitutions on the entire project, including the design, and shall reimburse the District for any charges resulting from such substitutions, including any charges for modifications in the work of other trades, and including any charges for additional design and review, plus reasonable and customary mark-ups.

37. TESTING

a. Materials, equipment, or other work requiring tests may be specified in the Contract Documents, and they shall be adequately identified and delivered to the site in ample time before intended use to allow for testing. If such materials, equipment or other work should be covered without required testing and approval, they shall be uncovered at the ESCO's expense, including any repairs or replacement resulting therefrom. The ESCO shall notify the District and Architect when and where such materials, equipment or other work are ready for testing, and ESCO shall bear the cost of making them available for testing. The ESCO shall notify the District and Architect sufficiently before the need for testing so as to cause no delay in the work and, in any case, at least forty-eight (48) hours prior to the need for testing.

b. The cost of initial tests called for will be paid by the District and will be performed by independent testing consultants retained by the District. All other tests and inspections specified or otherwise required to substantiate compliance with specified requirements for quality of material or performance of operation shall be paid for by the ESCO. If retesting or additional testing is necessary because of substandard initial test results, the costs thereof shall be paid by the ESCO, including any repairs or replacement resulting therefrom.

38. INSPECTION

a. All materials, equipment and workmanship used in the work of the Project shall be subject to inspection or testing at all times and locations during construction and/or manufacture. The District's and Architect's authorized representatives and representatives of other agencies having authority over the work shall have access to the work for the above purposes at all reasonable times and locations. Any material or work found to be unsatisfactory or not according to the Contract Documents shall be replaced with the correct material or work and the defective items promptly removed, all at the ESCO's expense, when directed to do so by any of the above-named persons having authority over the work. The cost of review time and analysis by the Architect or other District consultants necessitated by incomplete or defective work by the ESCO shall be charged to the ESCO.

b. Inspection and testing by the District or its representatives shall not relieve the ESCO from complying with the requirements of the Contract Documents. The ESCO is responsible for its own quality control.

c. Whenever required by the District or Architect, the ESCO shall furnish all tools, labor and materials necessary to make an examination of work in place by uncovering the same. Should such work be found unsatisfactory, the cost of examination and reconstruction shall be paid by the ESCO. Should such work be found satisfactory, the cost of examination and reconstruction of the work shall be paid by Change Order unless the ESCO improperly covered the work before it could be inspected or tested. If the ESCO considers it necessary or desirable to work on Saturday, Sunday or a holiday, ESCO shall seek written approval from the District at least forty-eight (48) hours before the commencement of such work.

39. CLEANUP

a. The ESCO shall maintain the premises and area of the work in a neat and clean condition. No burning of rubbish on-site shall be allowed. The ESCO shall control dust on the site by sprinkling at whatever intervals are necessary to keep it laid down, and shall take measures to prevent dust and debris from being accidentally transported outside the area of the work.

b. Final cleaning, such as sweeping, dusting, vacuuming, dry and wet mopping, polishing, sealing, waxing and other finish operations normally required on newly installed work shall be taken to indicate the finished conditions of the various new and existing surfaces at the time of acceptance. Prior to the time of acceptance, all marks, stains, fingerprints, dust, dirt, splattered paint and blemishes resulting from the various operations shall be removed throughout the Project. Stair treads and risers shall be wet-mopped. Glass shall be left clean and polished both inside and outside. Plumbing fixtures and light fixtures shall be washed clean. Hardware and other unpainted metals shall be cleaned and all building papers and other temporary protections shall be removed throughout the building, or portion of the building where ESCO was involved, all to the satisfaction of the Architect and District. The exterior of the buildings, playfields, exterior improvements, planting spaces, and other work areas shall be similarly clean and in good order.

40. CONSTRUCTION WASTE MANAGEMENT

a. Scope

- 1). This Article includes requirements for the diversion by the ESCO of construction and demolition debris from landfills. The ESCO shall develop and implement a Waste Management Plan as specified herein. The ESCO shall take a pro-active, responsible role in the management of construction and demolition waste and require all Sub-contractors, vendors, and suppliers to participate in the effort.
- 2). The District has established that this Project shall generate the least amount of waste practicable and that processes shall be utilized that ensure the generation of as little waste as possible due to over-packaging, error, poor planning, breakage, mishandling, contamination or other factors.
- 3). As much of the waste materials as economically feasible shall be reused, salvaged or recycled. Waste disposal in landfills shall be minimized.
- 4). The ESCO is encouraged to use waste hauling companies that separate recyclable materials. The ESCO shall work with its waste haulers in providing other recycling methods as appropriate.
- 5). The ESCO is responsible for implementation of any special programs involving rebates or similar incentives related to the recycling of waste. Revenues or other savings obtained for salvage or recycling accrue to the ESCO.

b. References

- 1). "Builders' Guide to Reuse and Recycling, A Directory for Construction and Demolition Materials."
- 2). "Construction Site Recycling, a Guide for Building ESCOs ". For a copy of the guide call 1-888-442-2666 or go to www.recycleworks.org.
- 3). "Where to Recycle Construction and Demolition Debris." For a copy of the guide call 1-888-442-2666 or go to www.recycleworks.org.

c. Definitions

- 1). General: Construction and demolition waste includes products of demolition or removal, excess or unusable construction materials, packaging materials for construction products, and other materials generated during the construction process but not incorporated into the work.
- 2). Divert" means to use material for any lawful purpose other than disposal in a landfill or transfer facility for disposal
- 3). "Recycling Service" means an off-site service that provides processing of material and diversion from a landfill.

4). "Hauler" means the entity that transports construction and demolition debris to either a landfill or a recycling service.

d. Compliance with Regulatory Requirements

1). The ESCO shall perform all handling, storage, transportation and disposal of construction debris in compliance with all applicable Federal, State, regional, and local statutes, laws, regulations, rules, ordinance, codes and standards.

2). Nothing stated on the drawings, in this Article 40 or in any other provision of the Contract Documents shall be construed as allowing work that is not in strict compliance with all applicable Federal, State, regional, and local statutes, laws, regulations, rules, ordinances, codes and standards.

e. Performance Requirement

1). The ESCO shall divert a minimum of 50 percent (50%) of the total Project construction and demolition waste from landfills.

f. Quality Control

1). General:

i) The ESCO shall not permit materials designated for diversion to become contaminated or to contaminate the site or surrounding areas.

2). Training and Coordination:

i) The ESCO shall designate an on-site party [or parties] who will be responsible for instructing workers and Sub-contractors, and overseeing and documenting the results of the Waste Management Plan for the Project.

ii) The ESCO shall furnish copies of the Waste Management Plan to all on-site supervisors, each Sub-contractor, and the District's representative.

iii) The ESCO shall include construction waste management as an item on the agenda of all progress meetings.

3). The Waste Management Plan:

i) The ESCO shall prepare a Waste Management Plan for diverting the specified percentage of construction debris from landfills, including written and graphic information indicating how the waste will be diverted.

ii) Include in the plan both on-site recycling of construction debris and off-site diversion from landfills.

iii) Identify the means and methods for collecting and separating each type of debris deemed reusable or recyclable.

iv) List the off-site recycling service and hauler of each designated debris item who has agreed to accept and divert that item from the landfill in the proposed quantities anticipated. List the service and hauler company name, address, telephone number, and persons contacted.

v) List the name of individuals on the ESCO's staff responsible for waste prevention and management.

vi) List the actions that will be taken to reduce solid waste generation, including coordination with Sub-contractors to ensure awareness and participation.

vii) Describe the specific approaches to be used in recycling/reuse of the various materials generated, including the areas on site and equipment to be used for processing, sorting, and temporary storage of wastes.

viii) Characterize the waste to be generated, including estimated types and quantities. Name the landfills and/or incinerator to be used.

ix) List the specific waste materials that will be salvaged for resale, salvaged and reused on the Project, salvaged and stored for reuse on a future project, or recycled. Recycling facilities that will be used shall be identified by name, location, and phone number.

x) Identify the materials that cannot be recycled or reused with an explanation or justification, to be approved by the Architect.

The ESCO shall submit the Plan to the Architect within 10 calendar days after receipt of the Notice to Proceed, or prior to any waste removal, whichever occurs first. The ESCO shall promptly revise and resubmit the Plan as required by the Architect. Review of the ESCO's Waste Management Plan will not relieve the ESCO of responsibility for compliance with applicable environmental regulations or meeting Project diversion requirements.

g. Plan Implementation

1). The ESCO shall implement the approved Waste Management Plan.

2). The ESCO shall maintain a log of each load and of each category of waste that is diverted from the landfill. The ESCO shall separately log the debris sent to a Class III landfill and materials sent to recycling facilities.

3). The ESCO shall include in the log the type of load, load weight, name of the hauling service, recycling service or landfill, and the date accepted by the recycling service or by the landfill.

4). The ESCO shall retain and make available all weight tickets and copies of receipts and invoices relating to the implementation of the Plan.

5). The District reserves the right to audit the log at any time.

h. Material Handling

1). Designate a specific area or areas on site to facilitate the separation of materials for potential reuse, salvage, recycling, and return. Clearly mark bins for each category of waste.

2). Keep waste bins and pile areas neat and clean. Do not contaminate non-recyclable waste with materials designated for reuse or recycling.

i. ESCO's Responsibilities

1). Provide on-site instruction of the appropriate separation, handling, recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the Project.

2). Separate, store, protect, and handle at the site identified recyclable and salvageable waste products in a manner that maximizes recyclability and salvagability of identified materials. Provide the necessary containers, bins and storage areas to facilitate effective waste management. Provide barriers and enclosures around recyclable material storage areas which are nonhazardous and recyclable or reusable and which shall be located away from construction traffic. Provide adequate space for pick-up and delivery. Use cleaning materials that are nonhazardous and biodegradable.

41. INSTRUCTIONS AND MANUALS

Three (3) copies of the maintenance instructions application/installation instructions and service manuals called for in the Specifications shall be provided by the ESCO. These shall be complete as to drawings, details, parts lists, performance data and other information that may be required for the District to easily maintain and service the materials and equipment installed under this Contract. All manufacturers' application/installation instructions shall be given to the Architect at least ten (10) days prior to first material application or installation of the item. The maintenance instructions and manuals, along with any specified guarantees, shall be delivered to

the Architect for review prior to submitting to District, and the ESCO or appropriate Sub-contractors shall instruct District's personnel in the operation and maintenance of the equipment prior to final acceptance of the Project.

42. AS-BUILT DRAWINGS

The ESCO and all Sub-contractors shall maintain on the work site a separate complete set of contract drawings which will be used solely for the purpose of recording changes made in any portion of the work during the course of construction, regardless of the reason for the change. As changes occur, there will be included or marked on this record set on a daily basis if necessary to keep them up to date at all times. Actual locations to scale shall be identified on the drawings for all runs of mechanical and electrical work, including all site utilities, installed underground, in walls, floors, and furred spaces, or otherwise concealed. Deviations from the drawings shall be shown in detail. All main runs, whether piping, conduit, duct work, drain lines, etc., shall be located in addition by dimension and elevation. Progress payments may be delayed or withheld until such time as the record set is brought up to date to the satisfaction of the Architect. The ESCO shall verify that all changes in the work are included in the "AS-BUILT" drawings and deliver the complete set thereof to the Architect for review and approval within thirty (30) calendar days after District's notice of completion. District's acceptance and approval of the "AS-BUILT" drawings are a necessary condition precedent to the release of the final retention.

43. SUBSTITUTION OF SECURITIES

a. Pursuant to Public Contract Code section 22300, ESCO may request in writing that it be allowed at its own expense to substitute securities for moneys withheld by District to ensure performance under this Contract. Only securities listed in Government Code Section 16430 and bank or savings and loan certificates of deposit, interest-bearing demand deposit accounts standby letters of credit, or any other security mutually agreed to by ESCO and District shall qualify under this Article. Securities equivalent to the amount withheld shall be deposited with the District or with a state or federally chartered bank in California as the escrow agent. Upon satisfactory completion of the Contract and on written authorization by the District, the securities shall be returned to ESCO. ESCO shall be the beneficial owner of the securities and shall receive any interest thereon. The ESCO may alternatively request District to make payment of retentions earned directly to the escrow agent at the expense of the ESCO.

b. At the expense of the ESCO, the ESCO may direct the investment of the payments into securities and the ESCO shall receive the interest earned on the investments upon the same terms provided for above for securities deposited by ESCO. Upon satisfactory completion of the contract, ESCO shall receive from the escrow agent all securities, interest, and payments received by the escrow agent from the District. The ESCO shall pay to each Sub-contractor, not later than 20 days of receipt of payment, the respective amount of interest earned, net of costs attributed to retention withheld from each Sub-contractor, on the amount of retention.

c. Any escrow agreement entered into pursuant to this Article shall comply with Public Contract Code section 22300 and shall be subject to approval by District's counsel.

44. NO DISCRIMINATION

It is the policy of the District that, in connection with all work performed under this public works contract, there shall be no discrimination against any prospective or active employee or any other person engaged in the work because of actual or perceived race, color, ancestry, national origin,

ethnic group identification, religion, sex, gender, sexual orientation, age, physical or mental disability, or marital status. The ESCO agrees to comply with applicable Federal and California laws including, but not limited to, the California Fair Employment Practice Act, beginning with Government Code §12900, Government Code §11135, and Labor Code §§ 1735, 1777.5, 1777.6 and 3077.5. In addition, the ESCO agrees to require like compliance by all Sub-contractors and suppliers.

45. LABOR STANDARDS

a. Work Hours:

In accordance with Labor Code section 1810, eight (8) hours of labor shall constitute a legal day's work under this Contract. ESCO and any Sub-contractor shall pay workers overtime pay as required by Labor Code section 1815. The ESCO shall pay each worker, laborer, mechanic or persons performing work under this Contract at a rate not less than the prevailing wage for each craft or classification covering the work actually performed.

b. Penalty:

ESCO shall forfeit to District as a penalty the sum of twenty-five dollars (\$25.00) for each worker employed in the execution of this Contract by ESCO or any Sub-contractor for each calendar day during which the worker is required or permitted to work more than eight (8) hours in any one (1) calendar day or more than forty (40) hours per calendar week in violation of Article 3, Division 2, Part 7, Chapter 1 of the California Labor Code.

c. Employment of Apprentices:

ESCO shall comply with Labor Code §§1773.3, 1777.5 and 1777.6, and 3077 et. seq., each of which is incorporated by reference into this Contract. These sections require that ESCOs and Sub-contractors employ apprentices in apprenticeable occupations in a ratio of not less than one (1) hour of apprentice work for every five (5) hours of labor performed by a journeyman, unless an exception is granted and that ESCOs and Sub-contractors shall not discriminate against otherwise qualified employees as apprentices on any public works solely on the ground of actual or perceived race, religion, color, national origin, ethnic group identification, sex, gender, sexual orientation, age, or physical or mental disability. Only apprentices who are in training under written apprenticeship occupations shall be employed. The responsibility for compliance with these provisions for all apprenticeable occupations rests with ESCO.

d. The ESCO shall be knowledgeable of and comply with Labor Code sections 1727, 1773.5, 1775, 1777, 1777.5, 1810, 1813, 1860, including all amendments thereto; each of these sections is incorporated by reference into this Contract.

46. GENERAL RATE OF PER DIEM WAGES

a. On File:

As required by Labor Code section 1773.2, the District has available copies of the general prevailing rate of per diem wages for workers employed on public work as determined by the Director of the Department of Industrial Relations, which shall be available to any interested party on request. ESCO shall post a copy of the document at each job site.

b. Prevailing Wage Rate:

The ESCO and each Sub-contractor shall pay each worker performing work under this Contract at a rate not less than the prevailing wage as defined in Labor Code section 1771 and 1774 and Section 16000(a) of Title 8, California Code of Regulations.

c. Penalty:

In accordance with Section 1775 of the Labor Code, the ESCO shall forfeit to the District as penalty, the sum of fifty dollars (\$50) for each calendar day, or portion thereof, for each worker paid less than the prevailing wage rates, as determined by the Director of the California Department of Industrial Relations, for any work done under this Contract by ESCO or by any Sub-contractor. ESCO shall also pay each worker the difference between the stipulated prevailing wages rates and the amount actually paid to such worker.

47. RECORD KEEPING

a. The ESCO agrees to comply with the provisions of Sections 1776 and 1812 of the Labor Code. The ESCO and each Sub-contractor shall keep or cause to be kept an accurate record showing the names, addresses, social security numbers, work classifications, straight time and overtime hours worked each day and week of all workers employed by ESCO in connection with the execution of this Contract or any subcontract thereunder and showing the actual per diem wages paid to each of such workers. These records shall be certified and shall be open at all reasonable hours to the inspection of the District awarding the Contract, its officers and agents, and to the Chief of the Division of Labor Statistics and Law Enforcement of the State Department of Industrial Law Enforcement of the State Department of Industrial Relations, and his or her other deputies and agents.

b. In addition, copies of the above records shall be available as follows:

- 1). A certified copy of an employee's payroll record shall be made available for inspection or furnished to the employee or his or her authorized representative on request;
- 2). A certified copy of all payroll records shall be made available for inspection or furnished upon request to the District, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the Department of Industrial Relations;
- 3). A certified copy of all payroll records shall be made available upon request by the public for inspection or copies thereof made; provided, however, that a request by the public shall be made through either the District, the Division of Apprenticeship Standards, or the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. If the requested payroll records have not been previously provided, the requesting party shall, prior to being provided the records, reimburse the costs of the ESCO, Sub-contractors, and the entity through which the request was made. The public shall not be given access to the records at the principal office of the ESCO.

c. The ESCO shall file a certified copy of the records with the entity requesting the records within ten days after receipt of a written request. Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by the District, shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address, and social security number. The name and address of the ESCO awarded the Contract or performing the Contract shall not be marked or obliterated.

d. The ESCO shall inform the Owner of the location of the records, including the street address, city and county, and shall, within five working days, provide a notice of a change of location and address.

e. In the event of noncompliance with the requirements of this section, the ESCO shall have ten days in which to comply subsequent to receipt of written notice specifying in what respects the ESCO must comply with this section. Should noncompliance still be evident after the ten day period, the ESCO shall, as a penalty to the District, forfeit twenty-five dollars (\$25) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due.

f. Responsibility for compliance with this provision shall be with the ESCO.

48. PROJECT COMPLETION

a. When all of the work to be performed under this Contract is has been fully completed, the ESCO shall notify the Architect and District, in writing, setting a date for inspection

The ESCO and Sub-contractor representatives shall attend the inspection. As a result of this inspection, the Architect will prepare a list of items ("punch list") that are incomplete or not installed according to the Contract Documents. Failure to include items on this list does not relieve the ESCO from fulfilling all requirements of the Contract Documents.

b. The Architect will promptly deliver the punch list to the ESCO and it will include a period of time by which the ESCO shall complete all items listed thereon. On completion of all items on the punch list, verified by a final inspection, and all other Contract requirements, so that Final Completion has been achieved to the District's satisfaction, the District will file a Notice of Completion with the County Recorder. Payment of retention from the Contract, less any sums withheld pursuant to the terms of this Contract or applicable law, shall not be made sooner than thirty-five (35) calendar days after the date of filing of Notice of Completion.

49. TRENCHING OR OTHER EXCAVATIONS

a. Excavations or Trenches Deeper than Four Feet:

If the project involves digging trenches or other excavations that extend deeper than four feet, the following provisions shall be a part of this Contract:

1). The ESCO shall promptly, and before the following conditions are disturbed, provide written notice to the District if the ESCO finds any of the following conditions:

(a) Material that the ESCO believes may be a hazardous waste, as defined in Section 25117 of the Health and Safety Code, which is required to be removed to a Class I, Class II, or Class III disposal site in accordance with the provisions of existing law.

(b) Subsurface or latent physical conditions at the site which are different from those indicated or expected.

(c) Unknown physical conditions at the site of any unusual nature or which are materially different from those ordinarily encountered and generally recognized as inherent in work which the ESCO generally performs.

2). In the event that the ESCO notifies the District that ESCO has found any of the conditions specified in subparagraphs (a), (b) or (c), above, the District shall promptly investigate the condition(s). If the District finds that the conditions are materially different or that a hazardous waste is present at the site which will affect the ESCO's cost of, or the time required for, performance of the Contract, the District shall issue a change order in accordance with the procedures set forth in this Contract.

3). In the event that a dispute arises between the District and the ESCO regarding any of the matters specified in Paragraph (2), above, the ESCO shall proceed with all work to be performed under the Contract and the ESCO shall not be excused from completing the Project as provided in the Contract. In performing the work pursuant to this Paragraph, the ESCO retains all rights provided by Article 50 which pertains to the resolution of disputes between the contracting parties.

b. Regional Notification Center:

The ESCO, except in an emergency, shall contact the appropriate regional notification center at least two (2) days prior to commencing any excavation if the excavation will be conducted in an area that is known, or reasonably should be known, to contain subsurface installations other than the underground facilities owned or operated by the District, and obtain an inquiry identification number from that notification center. No excavation shall be commenced and/or carried out by the ESCO unless an inquiry identification number has been assigned to the ESCO or any Sub-contractor and the ESCO has given the District the identification number. Any damages or delays arising from ESCO's failure to make appropriate notification shall be at the sole risk and expense of the ESCO and shall not be considered for an extension of the Contract time.

c. Existing Utility Lines:

1). Pursuant to Government Code section 4215, the District assumes the responsibility for removal, relocation, and protection of main or trunk utility lines and facilities located on the construction site at the time of commencement of construction under this contract with respect to any such utility facilities that are not identified in the plans and Specifications. ESCO shall not be assessed for liquidated damages for delay in completion of the Project caused by the failure of the District or the owner of a utility to provide for removal or relocation of such utility facilities.

2). Locations of existing utilities provided by the District shall not be considered exact, but approximate within reasonable margin and shall not relieve ESCO of responsibilities to exercise reasonable care nor costs of repair due to ESCO's failure to do so. The District shall compensate ESCO for the costs of locating and repairing damage not due to the failure of ESCO to exercise reasonable care, and removing or relocating such utility facilities not indicated in the plans and Specifications with reasonable accuracy.

3). No provision herein shall be construed to preclude assessment against ESCO for any other delays in completion of the project. Nothing in this Section shall be deemed to require the District to indicate the presence of existing service laterals, appurtenances, or other utility lines, with the exception of main or trunklines, whenever the presence of such utilities on the site of the construction Project can be inferred from the presence of other visible facilities, such as buildings, meter and junction boxes, on or adjacent to the site of the construction.

4). If ESCO, while performing work under this Contract, discovers utility facilities not identified by the District in the project plans and Specifications, ESCO shall immediately

notify the District and the utility in writing. The cost of repair for damage to above-mentioned visible facilities without prior written notification to the District shall be borne by the ESCO.

d. Prompt Notification:

ESCO understands, acknowledges and agrees that the purpose for prompt notification to the District pursuant to these provisions is to allow the District to investigate the condition(s) so that the District shall have the opportunity to decide how the District desires to proceed as a result of the conditions. Accordingly, failure of ESCO to promptly notify the District in writing, pursuant to these provisions, shall constitute ESCO's waiver of any claim for damages incurred as a result of the conditions.

e. Trenches Five Feet and Deeper:

Pursuant to Labor Code section 6705, if the contract price exceeds \$25,000 and involves the excavation of any trench or trenches five (5) feet or more in depth, the ESCO shall, in advance of excavation, promptly submit to the District and/or a registered civil or structural engineer employed by the District or Architect, a detailed plan showing the design of shoring for protection from the hazard of caving ground during the excavation of such trench or trenches.

50. RESOLUTION OF CONSTRUCTION CLAIMS

a. Public work claims of \$375,000 or less between the ESCO and the District are subject to the provisions of Article 1.5 (commencing with §20104) of Chapter 1 of Part 2 of the Public Contract Code ("Article 1.5 claim"). For purposes of Article 1.5, "public work" has the same meaning as set forth in §§3100 and 3106 of the Civil Code; "claims" means a separate demand by ESCO for a time extension or payment of money or damages arising from work done by or on behalf of ESCO pursuant to the Contract and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to or the amount of the payment which is disputed by the District.

b. All claims shall be submitted on or before the date of the Final Payment and shall include all documents necessary to substantiate the claim. District shall respond in writing within 45 days of receipt of claim if the claim is less than or equal to \$50,000 ("\$50,000 claim") or within 60 days if the claim is over \$50,000 but less than or equal to \$375,000 ("\$50,000 - \$375,000 claim"). In either case, District may request in writing within 30 days of receipt of claim any additional documentation supporting the claim or relating to any defenses to the claim which the District may have against the ESCO. Any additional information shall be requested and provided upon mutual agreement of the District and the ESCO. District's written response to the claim shall be submitted to ESCO within 15 days after receipt of the further documentation for \$50,000 claims or within 30 days after receipt of the further documentation for \$50,000 - \$375,000 claims or within a period of time no greater than that taken by the ESCO in producing the additional information, whichever is greater.

c. Within 15 days of receipt of the District's response, if ESCO disputes the District's written response, or within 15 days of the District's failure to respond within the time prescribed, the ESCO shall provide written notification to District demanding an informal conference to meet and confer ("conference") to be scheduled by District within 30 days. Following the conference, if any claim or portion remains in dispute, the ESCO may file a claim as provided in Chapter 1 (commencing with §900) and Chapter 2 (commencing with §910) of Part 3 of Division 3.6 of Title 1 of the Government Code. For purposes of those provisions, the period of time

within which a claim must be filed is tolled from the time the claimant submits a written claim pursuant to this section until the time that claim is denied as a result of the conference process, including any period of time utilized by the meet and confer process.

d. Pursuant to Public Contract Code §20104.2(f), this section does not apply to tort claims and does not change the period for filing claims or actions specified by Chapter 1 (commencing with §900) and Chapter 2 (commencing with §910) of Part 3 of Division 3.6 of Title 1 of the Government Code.

e. If a civil action is filed, within 60 days, but no earlier than 30 days, following the filing of responsive pleadings, the court shall submit the matter to nonbinding mediation unless waived by mutual stipulation of both parties. The mediation process shall provide that both parties select a disinterested third person mediator within 15 days, shall be commenced within 30 days of the submittal, and shall be concluded within 15 days of the commencement of the mediation unless time is extended upon a good cause showing to the court or by stipulation of the parties. If the parties fail to select a mediator within the 15-day period, any party may petition the court to appoint the mediator.

f. If the matter remains in dispute, the case shall be submitted to judicial arbitration as set forth in Public Contract Code §§20104.4 (b)(1) through (b)(3).

g. For any claim in excess of \$375,000, the ESCO and the District shall follow the same process as for an Article 1.5 claim. The District will forward a response within 60 days of submittal of any such claim. Judicial arbitration is not required for claims in excess of \$375,000.

h. In addition, for all unresolved claims that the ESCO wishes to pursue, the ESCO shall file a timely claim pursuant to the Government Claims Act and shall otherwise comply with the procedures set forth in that Act prior to commencing any litigation against the District. The accrual date for any such claim is the date the dispute or controversy first arose regarding the issues raised in the claim.

i. “The date of Final Payment,” as used in this Article 50, means the date the public entity is required to release retention proceeds in accordance with Public Contract Code §7107 regardless of whether any payment is made to the ESCO at that time.

j. The claims required by this Article are jurisdictional and conditions precedent to the commencement of any further legal proceedings. Strict compliance with all filing deadlines is mandatory.

51. DISABLED VETERANS PARTICIPATION GOALS (Applies to K-12 districts only.)

In accordance with Education Code §17076.11, this District has a participation goal for disabled veteran business enterprises (“DVBE”) of at least 3 percent (3%) per year of the overall dollar amount of funds allocated to the District by the State Allocation Board pursuant to the Leroy F. Greene School Facilities Act of 1998 for construction or modernization and expended each year by the District. Prior to, and as a condition precedent for final payment under any contract for such project, the ESCO shall provide appropriate documentation to the District identifying the amount paid to DBVE in conjunction with the Contract, so that the District can assess its success at meeting this goal.

52. RETENTION OF DVBE RECORDS (Applies to K-12 districts only.)

The ESCO agrees that, for all contracts subject to DVBE participation goals, the State and the District have the right to review, obtain and copy all records pertaining to performance of the contract in accordance with DVBE requirements. The ESCO agrees to provide the State or the District with any relevant information requested and shall permit the State or District access to its premises upon reasonable notice for purposes of interviewing employees and inspecting records. The ESCO agrees to maintain such records for a period of three years after final payment under the Contract.

53. FINGERPRINTING (Applies to K-12 districts only.)

District Determination of Fingerprinting Requirement Application

The District has considered the totality of the circumstances concerning the Project and has determined that the ESCO and ESCO's employee (which includes **Sub-contractor employees**):

 X are subject to the requirements of Education Code §45125.2 and Paragraph (a) below, is applicable.

 are not subject to the requirements of Education Code §45125.2, and Paragraph (b) below, is applicable.

a. Contracts for Construction, Reconstruction, Rehabilitation or Repair of a School Facility Involving More than Limited Contact with Students (§45125.2)

By execution of the Contract, the ESCO acknowledges that ESCO is entering into a contract for the construction, reconstruction, rehabilitation, or repair of a school facility where the ESCO and/or ESCO's employees will have more than limited contact with students and the services to be provided do not constitute an emergency or exceptional situation. In accordance with Education Code §45125.2 the ESCO shall, at ESCO's own expense, (1) install a physical barrier to limit contact with students by ESCO and/or ESCO's employees, and/or (2) provide for the continuous supervision and monitoring of the ESCO and/or ESCO's employees by an employee of the ESCO who has received fingerprint clearance from the California Department of Justice, and/or (3) provide for the surveillance of the ESCO and ESCO's employees by a District employee.

b. Contracts for Construction, Reconstruction, Rehabilitation or Repair of a School Facility Involving Only Limited Contact With Students (§45125.2)

By execution of the Contract, the ESCO acknowledges that ESCO is entering into a contract for the construction, reconstruction, rehabilitation or repair of a school facility involving only limited contact with students. Accordingly, the parties agree that the following conditions apply to any work performed by the ESCO and ESCO's employees on a school site: (1) ESCO and ESCO's employees shall check in with the school office each day immediately upon arriving at the school site; (2) ESCO and ESCO's employees shall inform school office staff of their proposed activities and location at the school site; (3) Once at such location, ESCO and ESCO's employees shall not change locations without contacting the school office; (4) ESCO and ESCO's employees shall not use student restroom facilities; and (5) If ESCO and/or ESCO's employees find themselves alone with a student, ESCO and ESCO's employees shall immediately contact the school office and request that a member of the school staff be assigned to the work location.

54. LABOR COMPLIANCE PROGRAM

The project is subject to compliance monitoring and enforcement by the California Department of Industrial Relations. In accordance with Labor Code section 1771.1, the ESCO and all Sub-contractors working at the site shall be duly registered with the Department of Industrial Relations at time of submitting proposals and at all relevant times. Proof of registration shall be provided as to all such ESCOs prior to the commencement of any work. ESCO shall coordinate with the Architect to ensure that DIR is advised of the award of the construction contract in a timely manner by filing form PWC-100 with DIR within five days of award of the contract.

55. DRUG-FREE WORKPLACE CERTIFICATION

ESCO certifies all of the following:

- a. ESCO is aware of the provisions and requirements of California Government Code §§ 8350 et seq., the Drug Free Workplace Act of 1990.
- b. ESCO is authorized to certify, and does certify, that a drug free workplace will be provided by doing all of the following:
 - 1). Publishing a statement notifying all employees that the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance is prohibited in ESCO's workplace and specifying actions which will be taken against employees for a violation of the prohibition;
 - 2). Establishing a drug-free awareness program to inform employees about all of the following:
 - (i) The dangers of drug abuse in the workplace;
 - (ii) ESCO's policy of maintaining a drug-free workplace;
 - (iii) The availability of drug counseling, rehabilitation and employee-assistance programs;and
 - (iv) The penalties that may be imposed upon employees for drug abuse violations;
- 3.) Requiring that each employee engaged in the performance of Work on the Project be given a copy of the statement required by subdivision (a), above, and that as a condition of employment by ESCO in connection with the Work on the Project, the employee agrees to abide by the terms of the statement.
- c. ESCO understands that if the District determines that ESCO has either: (a) made a false certification herein, or (b) violated this certification by failing to carry out and to implement the requirements of Government Code §§ 8350 et seq., the Contract is subject to termination, suspension of payments, or both. ESCO further understands that, should ESCO violate the terms of the Drug-Free Workplace Act of 1990, ESCO may be subject to debarment in accordance with the provisions of Government Code §§ 8350, et seq.

56. PROVISIONS REQUIRED BY LAW DEEMED INSERTED

Every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted, and this Contract shall be read and enforced as though it were included, and if through mistake or otherwise any provision is not inserted or is not correctly inserted, upon application of either party the Contract shall be amended to make the insertion or correction. All references to statutes and regulations shall include all amendments, replacements, and enactments on the subject which are in effect as of the date of this Contract.

57. GENERAL PROVISIONS**a. Assignment and Successors:**

Neither party may transfer or assign its rights or obligations under the Contract Documents, in part or in whole, without the other party's prior written consent. The Contract Documents are binding on the heirs, successors, and permitted assigns of the parties hereto.

b. Third Party Beneficiaries:

There are no intended third party beneficiaries to the Contract.

c. Choice of Law and Venue

The Contract Documents shall be governed by California law, and venue shall be in the Superior Court of the county in which the project is located, and no other place.

d. Severability

If any provision of the Contract Documents is determined to be illegal, invalid, or unenforceable, in part or in whole, the remaining provisions, or portions of the Contract Documents shall remain in full force and effect.

e. Entire Agreement

The Contract Documents constitute the final, complete, and exclusive statement of the terms of the agreement between the parties regarding the subject matter of the Contract Documents and supersedes all prior written or oral understandings or agreements of the parties.

f. Waiver

No waiver of a breach, failure of any condition, or any right or remedy contained in or granted by the provisions of the Contract Documents shall be effective unless it is in writing and signed by the party waiving the breach, failure, right, or remedy. No waiver of any breach, failure, right, or remedy shall be deemed a waiver of any other breach, failure, right, or remedy, whether or not similar, nor shall any waiver constitute a continuing waiver unless the writing so specifies.

g. Headings

The headings in the Contract Documents are included for convenience only and shall neither affect the construction or interpretation of any provision in the Contract Documents nor affect any of the rights or obligations of the parties to the Contract.

--End--

APPENDIX D: PERFORMANCE BOND

WHEREAS, the Governing Board of the Ferndale Unified School District (“District”), at its meeting on _____, 20____, has awarded to _____ (“Principal”), the Contract for performance of the following project (“Project”):
Proposition 39 Clean Energy Generation Project

WHEREAS, the Principal is required under the terms of the Contract to furnish a bond to the District as obligee ensuring its full and faithful performance of the Contract Documents, which are fully incorporated herein by this reference,

NOW, THEREFORE, we, the Principal and _____, as Surety, hereby guarantee the Principal’s full, faithful and complete performance of the Contract Document requirements in the penal sum of _____

_____ dollars
(\$ _____) for the payment of which sum will and truly be made, we bind ourselves, our heirs, executors, administrators and successors, jointly, severally, and firmly by this agreement to perform or have performed all of the work and activities required to complete the Project pursuant to the Contract Documents and to pay to the District all damages the District incurs as a result of the Principal’s failure to fully perform in accordance with the Contract Documents.

The condition of the obligation is such that if the Principal, its heirs, executors, administrators, successors or assigns shall in all things abide by, and well and truly keep and perform the covenants, conditions and agreements in the Contract Documents and any amendment thereof made as therein provided, on its or their parts to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall insure and indemnify and save harmless the District, its officers and agents, as therein stipulated, then this obligation shall become null and void. Otherwise, it shall be and remain in full force and effect.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the Contract Documents shall in any way affect its obligations on this bond and it does hereby waive notice of any such change, extension of time, alteration or addition.

Principal and Surety further agree to pay all costs incurred by the District in connection with enforcement of this bond, including, but not limited to the District’s reasonable attorney’s fees and costs incurred, with or without suit, in addition to any other sum required by this bond. Surety further agrees that death, dissolution, or bankruptcy of the Principal shall not relieve the Surety of its obligations hereunder.

In witness whereof, this instrument has been duly executed by the Principal and Surety this _____ day of _____, 20____.

*To be signed by
Principal and Surety
and acknowledgment
and notarial seal to
be attached.*

PRINCIPAL

By: _____

TITLE _____

SURETY

By: _____

TITLE _____

The above bond is accepted and approved this _____ day of _____,
20____.

By: _____
Authorized District Signature

APPENDIX E: PAYMENT BOND

WHEREAS, the _____ District (“District”) and the ESCO, _____ (“Principal”) have entered into a contract (“Contract”) for the furnishing of all materials, labor, services, equipment, tools, supervision and transportation necessary, convenient and proper for the _____ project (“Project”) which Contract dated _____, 20____, and all of the Contract Documents made part thereof are fully incorporated herein by this reference; and

WHEREAS, ESCO/Principal is required by Division 4, Part 6, Title 3, Chapter 5 (commencing at Section 9550) of the California Civil Code to furnish a bond in connection with the contract;

NOW, THEREFORE, we, the ESCO/Principal and _____ as Surety, are held firmly bound unto Owner in the penal sum of \$_____ Dollars (\$_____), lawful money of the United States of America for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if the ESCO/Principal, his/her or its heirs, executors, administrators, successors, or assigns, or a Sub-contractor, shall fail to pay any person or persons named in Civil Code Section 9100 or fail to pay for any materials or other supplies used in, upon, for, or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or for amounts due under the Unemployment Insurance Code with respect to work or labor thereon of any kind, or shall fail to deduct, withhold, and pay over to the Employment Development Department any amounts required to be deducted, withheld, and paid over by Section 13020 of the Unemployment Insurance Code with respect to work and labor thereon of any kind, then said Surety will pay for the same, in or to an amount not exceeding the amount set forth above, and in case suit is brought upon this bond Surety will also pay such reasonable attorney's fees as shall be fixed by the court, awarded and taxed as provided in Division 4, Part 6, Title 3, Chapter 5 (commencing at Section 9550) of the California Civil Code.

This bond shall inure to the benefit of any of the persons named in Section 9100 of the California Civil Code so as to give a right of action to such person or their assigns in any suit brought upon this bond. It is further stipulated and agreed that the Surety of this bond shall not be exonerated or released from the obligation of the bond by any change, extension of time for performance, addition, alteration, or modification in, to, or of any contract, plans, specifications, or agreement pertaining or relating to any scheme or work of improvement described above or pertaining or relating to the furnishing of labor, materials, or equipment therefor, nor by any change or modification of any terms of payment or extension of the time for any payment pertaining or relating to any scheme or work of improvement described above, nor by any rescission or attempted rescission of the contract, agreement, or bond, nor by any conditions precedent or subsequent in the bond attempting to limit the right of recovery of claimants otherwise entitled to recover under any such contract or agreement or under the bond, nor by any fraud practiced by any person other than the claimant seeking to recover on the bond, and that this bond be construed most strongly against the Surety and in favor of all persons for whose benefit such bond is given, and under no circumstances shall Surety be released from liability to those for whose benefit such bond has been given, by reason of any breach of contract between the Owner and original ESCO or on the part of any obligee named in such bond, but the sole conditions of recovery shall be that claimant is a person described in Section 8400 and 8402 of the California Civil Code and has not

RFQ/RFP For Energy Efficiency Upgrades

been paid the full amount of his/her or its claim and that Surety does hereby waive notice of any such change, extension of time, addition, alteration, or modification.

In witness whereof, this instrument has been duly executed by the Principal and Surety this _____ day of _____, 20__.

*To be signed by
Principal and Surety
and acknowledgment
and notarial seal to
be attached.*

PRINCIPAL

By: _____

Title

SURETY

By: _____

Title

The above bond is accepted and approved this _____ day of _____, 20__.

By: _____
Authorized District Signature

APPENDIX F: TECHNICAL FACILITY PROFILE

The information in this technical facility profile is provided to inform the proposer about the facilities.

Operating Information

- The Ferndale Unified School District's Summer Break begins June 19, 2017 – the District requests that the energy efficiency upgrade installation occur during Summer Break, or during an alternate break, e.g., Thanksgiving, Winter Break.

Site and Building Information

- Ferndale Elementary School – 164 Shaw Avenue, Ferndale, California
 - Approximately 37,669 square feet of conditioned space in three main buildings owned and operated by the District.
- Ferndale High School – 1231 Main Street, Ferndale, California
 - Approximately 42,958 square feet of conditioned space in three main buildings owned and operated by the District.
- Refer to Attachment 1: ASHRAE II Energy Audit

ASHRAE Level 2 Energy Audit Report



Prepared for the
Ferndale Unified School
District



FERNDALE ELEMENTARY SCHOOL
HOME OF THE MUSTANGS

164 Shaw Avenue
Ferndale, California 95536



Ferndale High School
Home of the Wildcats

1231 Main Street
Ferndale, California 95536

July 10, 2015



TABLE OF CONTENTS

| | |
|---|----|
| Definitions of Common Terms and Acronyms..... | iv |
| Disclaimer..... | v |
| 1 Executive Summary..... | 1 |
| 1.1 Your Cost Reduction Opportunities | 1 |
| 1.2 Health & Safety (H&S) and Operation & Maintenance Measures (MM) Summary | 4 |
| Ferndale Elementary School | 4 |
| Ferndale High School | 4 |
| 2 Project Team and Facility Information..... | 5 |
| 2.1 Project Contacts..... | 5 |
| 2.2 Ferndale Elementary School - General Site Information | 6 |
| 2.3 Ferndale Elementary School - Building Occupancy..... | 7 |
| 2.4 Ferndale Elementary School - Building Envelope | 7 |
| Original Classroom Building | 7 |
| Gymnasium and Multi-Purpose Room..... | 8 |
| Annex | 10 |
| 2.5 Ferndale Elementary School – Energy Using Systems | 11 |
| Lighting Systems..... | 11 |
| Heating, Ventilation and Air-Conditioning (HVAC) | 11 |
| Domestic Hot Water | 16 |
| Other Energy Using Systems of Note..... | 16 |
| 2.6 Ferndale High School – General Site Information..... | 17 |
| 2.7 Ferndale High School – Building Occupancy..... | 18 |
| 2.8 Ferndale High School – Building Envelope..... | 18 |
| Classrooms and Administrative Offices | 18 |
| Gymnasium | 19 |
| Shop Class and Ag Building | 21 |
| 2.9 Ferndale High School – Energy Using Systems | 21 |

| | |
|--|----|
| Lighting Systems..... | 21 |
| Heating, Ventilation and Air-Conditioning (HVAC) | 22 |
| Domestic Hot Water (DHW)..... | 26 |
| Other Energy Using Systems of Note..... | 27 |
| 3 Site Energy Use and Costs..... | 28 |
| 3.1 Ferndale Elementary School - Total Cost of Energy..... | 28 |
| 3.2 Ferndale Elementary School – Energy Benchmarking and Average Annual Energy Consumption Profile 30 | |
| 3.3 Ferndale High School - Total Cost of Energy..... | 31 |
| 3.4 Ferndale High School – Energy Benchmarking and Average Annual Energy Consumption Profile 32 | |
| 4 Energy Project Opportunities..... | 35 |
| 4.1 Energy Analysis Methodology..... | 35 |
| ASHRAE Level II Energy Audit..... | 35 |
| Measure Order..... | 36 |
| Building Energy Performance Modeling | 36 |
| Spreadsheet Models | 36 |
| Cost Estimating | 36 |
| Economic Evaluation..... | 36 |
| 4.2 Ferndale Elementary School (FES) - Low-Cost/No-Cost Measures (LCM) | 37 |
| LCM-1: FHS - Repair Pressure Relief Valve (PRV) on Original Classroom Building Boiler | 37 |
| LCM-2: FES - Install Boiler Timer and Relocate Outdoor Air Temperature Sensor..... | 38 |
| LCM-3: FES – Install New Aquastats and Lower Boiler Water Temperature | 39 |
| LCM-4: FES - Remove Heat Tracer on Domestic Hot Water Pipe | 40 |
| LCM-5: FES - Install DHW Timer | 41 |
| 4.3 Ferndale Elementary School (FES) – Capital Intensive Measures (CIM) | 42 |
| CIM-1: FES – Install Centrally Controlled WIFI Enabled Thermostats with Passive Infrared (PIR) Occupancy Detection and Demand Control Ventilation System | 42 |
| CIM-2: FES – Install Lighting Occupancy Sensors..... | 44 |
| CIM-3: FES - Install Operable Ventilation Louvers in Gymnasium | 45 |
| CIM-4: FES - Insulate Roof over Gymnasium | 46 |
| CIM-5 FES - Replace Existing Propane Furnaces Over 10 Years Old with High Efficiency Equivalent. 47 | |

| | |
|--|----|
| CIM-6: FHS – Replace Existing Propane Furnaces with High Efficiency Ductless Heat Pumps | 48 |
| 4.4 Ferndale Elementary School (FES) – Health & Safety Measures (H&S) and Operation & Maintenance Measures (OMM) | 49 |
| H&S-1: FES - Seal Ducts in Annex Attic | 49 |
| H&S-2: FES – Fire Doors in Original Classroom Building Wired Open..... | 49 |
| OMM-1: FES - Increase Annex Attic Ventilation and Air Seal | 49 |
| OMM-2: FES - Improve Heat Distribution in the Original Classroom Building | 50 |
| OMM-3: FES – Repair/Replace weatherstripping on exterior doors | 50 |
| OMM-4: FES – Enable Power Saving Protocols on all Computers | 50 |
| 4.5 Ferndale Elementary School - Measures Considered But Not Analyzed (CBNA)..... | 51 |
| CBNA-1: FES - Add to Existing Insulation in Main Building | 51 |
| CBNA-2: FES - Insulate Elementary Gymnasium Floor..... | 51 |
| CBNA-3: FES - Heat Recovery Ventilators | 51 |
| 4.6 Ferndale High School (FHS) - Low-Cost/No-Cost Measures (LCM) | 52 |
| LCM-1: FHS - Repair Pressure Relief Valve (PRV) on Gymnasium Boiler | 52 |
| LCM-2: FHS - Install Gymnasium Boiler Timer | 53 |
| LCM-3: FHS – Install New Aquastats and Lower Gymnasium Boiler Water Temperature | 54 |
| LCM-4: FHS – Install Lighting Controls on Metal Halide Lights in Basketball Court..... | 55 |
| 4.7 Ferndale High School (FHS) – Capital Intensive Measures (CIM)..... | 56 |
| CIM-1: FHS - Isolate Gymnasium Roof Top Air Handler Coils | 56 |
| CIM-2: FHS - Replace Gymnasium Heating and Domestic Water Heating Systems | 57 |
| CIM-3: FHS – Install Centrally Controlled WIFI Enabled Thermostats with Passive Infrared (PIR) Occupancy Detection and Demand Control Ventilation System | 58 |
| CIM-4: FHS – Insulate Attic in Main Classroom Building and Administrative Offices..... | 59 |
| CIM-5: FHS – Replace Existing Single-Paned Windows with Double-Paned Equivalent | 60 |
| CIM-6: FHS – Replace Existing Propane Furnaces Over 10 Years Old with High Efficiency Equivalent | 61 |
| CIM-7: FHS – Replace Existing Propane Furnaces with High Efficiency, Multi-Head (VRF) Ductless Heat Pumps..... | 62 |
| CIM-8: FHS – Install Lighting Occupancy Sensors | 63 |
| 4.8 Ferndale High School (FHS) – Health & Safety Measures (H&S) and Operation & Maintenance Measures (OMM)..... | 63 |
| H&S-1: FHS – Propane gas leaks noted at furnaces | 63 |

| | |
|--|----|
| H&S-2: FHS – Fire Doors in Original Classroom Building Wired Open | 63 |
| OMM-1: FHS - Purge Shop Class Air Compressor of Accumulated Moisture | 64 |
| OMM-2: FHS - Clear Gymnasium Roof of Vegetation and Debris Bi-Annually | 64 |
| OMM-3: FHS – Repair/Replace weatherstripping on exterior doors | 64 |
| OMM-4: FHS – Enable Power Saving Protocols on all Computers..... | 64 |
| 4.9 Ferndale High School - Measures Considered But Not Analyzed | 64 |
| CBNA-1: FHS - Lower Ceilings in Classrooms | 65 |

Definitions of Common Terms and Acronyms

- 1) **Benchmarking** – In order to assess the energy usage of each structure, relative to similar structure within the same climate zone, the EUI for each structure was “benchmarked” with the average energy use for similar buildings as characterized by the 2005 U.S. Energy Information Administration (EIA) Residential Energy Consumption Survey (RECS) for the Del Norte County climate zone.
- 2) **BTU** – Energy term; British Thermal Unit; the amount of energy required to raise one pound of water one degree Fahrenheit.
- 3) **BTU/hour (BTUH)** – Power term; BTU per hour
- 4) **CFM** – Cubic feet per minute; typical unit of air flow and/or air leakage
- 5) **CIM** – Capital intensive measure; energy conservation measure with a required capital investment of over \$1,000.
- 6) **DHW** – Domestic hot water
- 7) **ECM** – Energy conservation measure
- 8) **EUI** - Energy Use Index (or Energy Use Intensity) is defined as the average annual energy use per square foot of building area. This metric is used to quantify the energy usage “density” of a structure.
- 9) **Fenestration** – Any intended opening in the building envelope (windows and doors).
- 10) **H&S** – Health and safety measure
- 11) **HVAC** – Heating, Ventilation and Air Conditioning
- 12) **HVAC Cycling** – Frequent start/stop run time regimes
- 13) **kBTU/sq ft./year** – Measurement of energy density in annual energy use per square foot of facility.
- 14) **Kilowatt (kW)** –Power term; 1000 watts of electrical power
- 15) **Kilowatt hour (kWh)** – Energy term; 1 kW for 1 hour
- 16) **LCM** – Low cost measure; energy conservation measures with a required capital investment of less than \$1,000.
- 17) **MM** – Maintenance measure
- 18) **MMBTU** – One Million BTU
- 19) **R-Value** – A measurement of thermal resistance BTU
- 20) **Standby Losses (Phantom Power)** – Energy used by appliances or equipment when it is in “idle” mode.
- 21) **Thermosyphoning** – A physical effect that refers to a method of passive heat exchange based on natural convection, which circulates a fluid without the necessity of a mechanical pump

Disclaimer

The intent of this energy analysis report is to estimate energy savings associated with recommended upgrades to the building energy systems at two school campuses operated by the Ferndale Unified School District. Appropriate detail is included in this report to make decisions about planning and implementing energy efficiency measures at these facilities. However, this report is not intended to serve as a detailed engineering design document. The descriptions of existing conditions and recommended improvements are diagrammatic in nature in order to document the basis of cost estimates and savings. It should be noted that detailed design efforts may be required in order to implement some or all of the energy conservation measures detailed in this report. As appropriate, costs for these design efforts are included as part of the cost estimate for the respective measure.

While the recommendations in this report have been reviewed for technical accuracy and are believed to be reasonably accurate given the access to specific systems, available specifications and cost data, the findings are estimates and actual results may vary. As a result OurEvolution Energy & Engineering is not liable if projected estimated savings or economics are not actually achieved. All savings and cost estimates in this report are for informational purposes, and are not to be construed as a design document or as guarantees.

All information provided in this report is based on observed field conditions of building systems identified. OurEvolution engineers made a reasonable effort to identify and access all systems affecting building energy use but do not guarantee that all systems were identified, or that all deleterious conditions were observed and noted. In no event will OurEvolution Energy & Engineering be liable for failure of the customer to achieve a specified amount of energy savings, the operation of customer's facilities, or any incidental or consequential damages of any kind in connection with this report or the installation of recommended measures.

1 Executive Summary

The Ferndale Unified School District (District) contracted OurEvolution Energy & Engineering (OE) to prepare this ASHRAE Level 2 Energy Audit Report for its facilities located in Ferndale, California. The goal of the energy audit process is to identify potential high-value energy efficiency and energy conservation opportunities. Other goals of this study include identifying and documenting observed conditions that affect building performance, operation and maintenance, occupant comfort, and health and safety.

This study was completed by OurEvolution Energy & Engineering to assist the District to determine the energy savings potential and specific energy use reduction opportunities for the following locations:

- Ferndale Elementary School – 164 Shaw Avenue, Ferndale, California
 - Approximately 37,669 square feet of conditioned space in three main buildings owned and operated by the District.
- Ferndale High School – 1231 Main Street, Ferndale, California
 - Approximately 42,958 square feet of conditioned space in three main buildings owned and operated by the District.

OE engineers spent several days throughout January and February 2015 completing on-site assessment and load monitoring activities. A list of proposed energy conservation measures (ECM) was discussed with District stakeholders at a meeting held at the District office on January 29, 2015.

Using this ASHRAE Level 2 Energy Audit as a guide, OE encourages the District to consider the ECMs recommended in this report that have paybacks of less than ten years and/or savings to investment ratios of 1.05 or greater and/or can be justified due to building performance and longevity requirements. ECMs are divided into Low Cost/No Cost Measures (LCM) and Capital Intensive Measures (CIM). LCMs are defined by a capital investment of less than \$1,000. The remaining measures are considered CIM. Additionally OE included a discussion of identified Health & Safety Measures (H&S) and Operation & Maintenance Measures (OMM). All of the H&S and OMM issues identified should be addressed as part of routine building operations.

1.1 Your Cost Reduction Opportunities

The following tables summarize the measures that are recommended for each facility.

Table 1. Ferndale Elementary School - Energy Conservation Measure Summary

| Measure I.D. | Measure Description | Annual Energy & Cost Savings | | | | Estimated Capital Costs/Payback | | |
|--------------|--|------------------------------------|----------------------------|--------------------------------|-------------------------------------|---------------------------------|-------|------------------------|
| | | Electrical Energy Savings (kWh/yr) | Fuel Oil Savings (Gallons) | Propane Savings (gallons/year) | Total Energy Cost Savings (\$/year) | Net Measure Cost (\$) | SIR | Simple Payback (years) |
| LCM-1 | Repair pressure relief valve (PRV) on boiler | 0 | 193 | | \$890 | \$368 | 9.82 | 0.41 |
| LCM - 2 | Install timer on boiler controls and program outdoor temperature reset | 0 | 414 | | \$1,084 | \$413 | 13.82 | 0.38 |
| LCM - 3 | Lower boiler temperature setpoints | 0 | 78 | | \$370 | \$534 | 3.50 | 1.44 |
| LCM - 4 | Remove heat tracer on hot water line to kitchen | 2,102 | | n/a | \$357 | \$25 | 77.41 | 0.07 |
| LCM - 5 | Install timer on domestic hot water heater and heat tracer | 657 | | n/a | \$112 | \$313 | 6.86 | 2.80 |
| CIM-1 | Install central HVAC control with Demand Control Ventilation | 232 | | 2,148 | \$6,233 | \$96,930 | 0.87 | 15.55 |
| CIM-2 | Install lighting occupancy sensors | 4,703 | -33 | | \$652 | \$1,984 | 2.70 | 3.04 |
| CIM-3 | Install operable ventilation dampers | 17 | | 36 | \$109 | \$1,852 | 0.74 | 16.99 |
| CIM-4 | Insulate roof | -237 | | 44 | \$187 | \$9,419 | 0.67 | 50.37 |
| CIM-5 | (Long term planning) Replace HVAC systems - condensing furnaces | 0 | | 647 | \$2,266 | \$67,275 | 0.72 | 29.69 |
| CIM-6 | (Long term planning) Replace HVAC systems - Ductless Heat Pumps | -77 | | 2605 | \$6,480 | \$97,175 | 1.19 | 15.00 |

Table 2. Ferndale High School - Energy Conservation Measure Summary

| Measure I.D. | Measure Name | Estimated Annual Savings | | | Estimated Capital Costs/Payback | | |
|--------------|---|--------------------------------------|--------------------------------|-------------------------------------|---------------------------------|-------|------------------------|
| | | Electrical Energy Savings (kWh/year) | Propane Savings (gallons/year) | Total Energy Cost Savings (\$/year) | Net Measure Cost (\$) | SIR | Simple Payback (years) |
| LCM-1 | Replace pressure relief valve (PRV) on boiler | 0 | 552 | \$1,570 | \$366 | 18.28 | 0.2 |
| LCM-2 | Install boiler timer/controls to eliminate run time between 6:00 PM and 6:00 PM | 0 | 1,352 | \$3,448 | \$388 | 125.3 | 0.1 |
| LCM - 3 | Install new aquastats and Lower boiler water temperatures | 0 | 190 | \$484 | \$534 | 4.55 | 1.1 |
| LCM - 4 | Install lockable lighting switch on MH circuit. Operate lights only when necessary | 8,100 | n/a | \$1,377 | \$270 | 39.67 | 0.2 |
| CIM - 1 | Isolate rooftop air handler heat coils | 0 | 704 | \$1,795 | \$3,299 | 2.77 | 1.8 |
| CIM - 2 | 1) Remove domestic hot water (DHW) tank, pump and replace with on-demand water heating system 2) Remove boiler and replace with propane unit heaters | 3,948 | 2,276 | \$6,707 | \$37,185 | 3.62 | 5.5 |
| CIM - 3 | Install central HVAC control w/demand control ventilation | 281 | 1,274 | \$3,305 | \$39,848 | 1.06 | 12.1 |
| CIM - 4 | Insulate attic in main school facility | 253 | 622 | \$1,652 | \$15,873 | 2.22 | 9.6 |
| CIM - 5 | Replace single paned glazing with dual paned | -653 | 508 | \$1,220 | \$100,625 | 0.53 | 82.5 |
| CIM - 6 | Replace five existing furnaces older than 10 years old with condensing furnaces | 0 | 271 | \$690 | \$25,875 | 0.23 | 37.5 |
| CIM - 7 | Replace existing furnaces with multi-head ductless heat pump systems | -42,462 | 6,562 | \$8,862 | \$97,175 | 1.53 | 11.0 |
| CIM - 8 | Install lighting occupancy sensors | 10,974 | -78 | \$1,522 | \$4,629 | 2.70 | 3.0 |

Total energy savings of up to 30% has been projected for each of the subject facilities. However, because several alternative measures have been presented for specific conditions, the actual total projected energy savings for each facility is dependent on the final package of measures selected and implemented.

1.2 Health & Safety (H&S) and Operation & Maintenance Measures (MM)

Summary

The following conditions were noted at Ferndale Elementary School (FES) and Ferndale High School (FHS). Though not strictly energy efficiency measures, these conditions can affect occupant health, safety and comfort and/or affect overall building performance. See appropriate sections of this report for more detail.

Ferndale Elementary School

- H&S-1: FES - Seal Ducts in Annex Attic
- H&S-2: FES – Fire Doors in Original Classroom Building Wired Open
- OMM-1: FES - Increase Annex Attic Ventilation and Air Seal
- OMM-2: FES - Improve Heat Distribution in the Original Classroom Building
- OMM-3: FES – Repair/Replace weatherstripping on exterior doors
- OMM-4: FES – Enable Power Saving Protocols on all Computers

Ferndale High School

- H&S-1: FHS – Propane Gas Leaks Noted at Furnaces
- H&S-2: FHS – Fire Doors in Original Classroom Building Wired Open
- OMM-1: FHS - Purge Shop Class Air Compressor of Accumulated Moisture
- OMM-2: FHS - Clear Gym Roof of Vegetation and Debris Bi-Annually
- OMM-3: FHS – Repair/Replace weatherstripping on exterior doors
- OMM-4: FHS – Enable Power Saving Protocols on all Computers

2 Project Team and Facility Information

2.1 Project Contacts

| Name | Role | Organization | Contact Information |
|--------------------|-------------------------------|-----------------------------------|--|
| Jack Lakin | District Superintendent | Ferndale Unified School District | jlakin@humboldt.k12.ca.us 707.786.5904 |
| Denise Grinsell | Business Manager | Ferndale Unified School District | dgrinsell@humboldt.k12.ca.us 707.786.5904 |
| Rick Machado | Maintenance Supervisor | Ferndale Unified School District | 707.786.5904 |
| Andy Sorter, P.E. | Energy Engineer/Auditor | OurEvolution Energy & Engineering | andy@ourevolution.com 707.633.4210 |
| Scott Willits, EIT | Energy Engineer/Auditor | OurEvolution Energy & Engineering | scott@ourevolution.com 707.633.4210 |
| Allison Campbell | Proposition 39 Energy Manager | Redwood Coast Energy Authority | acampbell@redwoodenergy.org 707.269.1700 |
| Katie Koscielak | Proposition 39 Energy Manager | Redwood Coast Energy Authority | kkoscielak@redwoodenergy.org 707.269.1700 |

2.2 Ferndale Elementary School - General Site Information

The Ferndale Unified School District operates two campuses in Ferndale, California. Figures 1 and 2 detail the configuration of each campus.

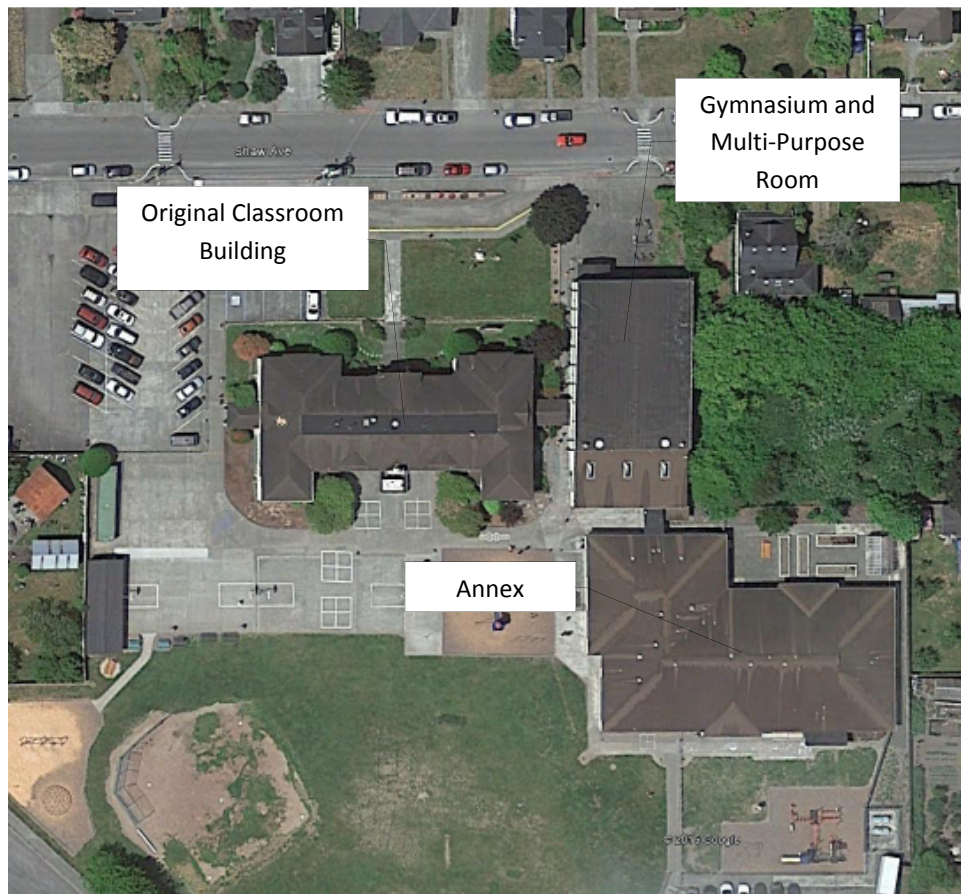


Figure 1. Aerial View of Ferndale Elementary School Campus

Ferndale Elementary contains three separate buildings comprising approximately 37,669 square feet of conditioned space. These facilities include:

- Original Classroom Building – 17,632 square feet of conditioned space containing six main floor classrooms, counseling and speech rooms, and administrative offices; the basement level contains an additional three classrooms, commercial kitchen, storage and janitorial office, restrooms and boiler room.
- Gymnasium and Multi-Purpose Room – 13,737 square feet of conditioned space containing a basketball court, equipment storage, and cafeteria/multi-purpose area.
- Annex – 6,300 square feet of conditioned space containing eight classrooms, library, computer lab, teacher's work room, six restrooms, and storage area.

2.3 Ferndale Elementary School - Building Occupancy

Ferndale Elementary School has average daily student and staff occupancy of 250-300. The main classroom facilities are occupied Monday through Friday, 7:00 a.m. to 4:00 p.m. with sporadic after hours and weekend hour occupancy. The Gymnasium is used for physical education and extra-curricular sports so is occupied for relatively short periods daily for classes, after hours and weekends depending on the sports schedule.

2.4 Ferndale Elementary School - Building Envelope

This section provides information on any adverse conditions of building envelope elements noted during the field assessment. Envelope elements evaluated for this assessment include exterior walls, fenestration (doors and windows), attics, roofs and crawlspaces.

Original Classroom Building

The original classroom building was constructed in 1924 and has had seismic retrofits, remodels and significant mechanical system upgrades in the intervening years. The facility is constructed of conventional wood-framing over a basement foundation and clad with stucco siding.

- Fenestration –
 - Windows consist of dual-paned, aluminum-framed elements. Appeared to be in good working order at the time of the assessment. A significant amount of south facing glass was noted in classrooms M3 and M4, which is likely one reason for overheating noted by occupants.
 - Exterior doors consist largely of full-light and half-light glass doors. Exterior weather stripping on these doors was non-existent or damaged.
- Attic – The attic space is insulated with a combination of fiberglass batt and loose-fill insulation. This insulation is present in much of the attic space but does not provide 100% coverage. ***The effective R-Value of the existing attic insulation is R-9***, because of its non-continuous application. Floors have been constructed throughout the attic to provide fire access and access to mechanical systems. These floors and required access would likely make an insulation retrofit infeasible. **NOTE: Fire doors in the attic space have been wired open. This leads to a hazardous condition. Wires holding doors open should be removed and fire doors kept closed.**
- Roof – The roof on this facility is mostly pitched, with a flat section at the top ridge. The flat portion has been re-roofed within the past 2 years with rolled “torch-down material”. The remaining roof is clad with asphalt, 3-tab roofing material. This material is reaching the end of its serviceable life with obvious signs of deterioration including lifted, missing and/or damaged tabs, signs of patching around roof penetrations, areas where aggregate shows significant wear in roofing material, exposed fiberglass backing material and significant moss growth on the north side.



Figure 2. Image showing north side portion of roof showing moss growth, lifted asphalt shingle corners and original redwood gutters.



Figure 3. Image illustrating damaged roofing material around roof penetration.

- Roof Drainage – The roof drainage system consists of a combination of seamless metal gutters and the original redwood gutter systems. Metal gutters have replaced the original gutters on the south side of the structure, while the original system remains on the north side. The redwood gutters do not appear to have adequate capacity to route all roof runoff to downspouts as evidenced by staining on the sides of the gutter system.

Gymnasium and Multi-Purpose Room

The Gym was constructed in 1967 with the addition of the multi-purpose room in 2001. The gymnasium is of modular construction with tilt up walls constructed on a perimeter foundation.

- Exterior Walls – The exterior walls of the gym are integrally insulated modular panels with an estimated effective R-Value of R-7. These walls are in fair to poor condition with obvious signs

of deterioration of the weather resistant barrier. Due to their construction type, retrofitting insulation is not possible without adding to the wall thickness.

- Two large outside air ventilation dampers penetrate the walls on the east and west sides on the north end of the gym. These dampers have been permanently blocked open to provide ventilation. This condition allows uncontrolled air-flow into the building.
- Fenestration –
 - The doors in the gym and multi-purpose room consist of insulated core steel and half-light glass doors. Weatherstripping on these doors was impacted and should be replaced.
- Roof – The roof of the gym is flat and clad with rolled “torch-down” roofing material. School staff indicate that there are leakage issues around the perimeter of the roof due to adverse slope conditions that do not allow the roof to fully drain to the perimeter gutter system. Low spots around the perimeter and roof field were noted during the field assessment. These areas allow water to stand on the roof leading to deterioration. No evidence of insulation was noted in the Gym roof or vaulted ceiling.

The roof of the multi-purpose room is pitched and clad in asphalt, 3-tab shingles. This material is reaching the end of its serviceable life with obvious signs of deterioration including lifted, missing and/or damaged tabs.



Figure 4. Image detailing flat portion of original building roof, gymnasium roof and multi-purpose room roof.

- Crawlspace – The gym is constructed on a concrete perimeter foundation and has an uninsulated floor. Assessment of the crawlspace indicates that though the foundation footing was excavated, the interior portion of the crawlspace is largely unexcavated which significantly limits access to an approximately 10” to 12” height. This access issue makes an insulation retrofit largely infeasible.



Figure 5. Photo showing uninsulated gym floor, excavated perimeter and limited crawlspace access.

Annex

The Annex was constructed in 2001 of conventional wood framing with stucco siding. No significant adverse envelope conditions relating to walls, fenestration, or roof were noted.

- Attic – The attic at the annex is insulated with loose fill fiberglass insulation to an estimated effective R-Value of R-30. Interviews with staff indicated that the southern exposed classrooms (1, 3, 5 and 7) experience regular overheated conditions. This is likely due to a combination of reasons; however, in evaluating the attic above these classrooms, OE engineers noted that the soffit and ridge ventilation provided over classrooms 3 and 5 specifically is insufficient to adequately ventilate the attic space above these classrooms. This is due to the fact that an architectural feature on the south wall at the location of these classrooms largely blocks the soffit ventilation provided. An infrared survey of the attic in this area indicates that it can reach temperatures of over 120°F even on relatively mild days, which is likely a main cause of the overheating in the associated classrooms.

2.5 Ferndale Elementary School – Energy Using Systems

Lighting Systems

The vast majority of the lighting at Ferndale Elementary School is provided by 32-watt (4'), T-8 lamps in two to four lamp recessed or surface mounted fixtures. Gymnasium lighting is provided by high-bay, 50-watt (4'), T-5 lamps in 8 lamp, suspended fixtures. Though the Annex classrooms, hallways and common areas are equipped with lighting occupancy sensors, no occupancy sensors were noted in the original building, gym or multipurpose room where all lighting is controlled manually via wall switches.

Heating, Ventilation and Air-Conditioning (HVAC)

Ferndale Elementary School heating and ventilation is provided by several systems serving the three buildings and multiple zones. There is no mechanical cooling at the elementary school. Tables 3 - 5 detail the systems identified during the field assessment and review of mechanical drawings.

Table 3 - Ferndale Elementary Original Classroom Building - Central Boiler Plant Partial Equipment Schedule

| Component | Make/Model | Rating | Vintage | Notes |
|--|-----------------------------------|-----------------------------------|---------|---|
| Boiler | Peerless Model LC-05R-W/S | 564,000 BTUH Water Fuel Oil Fired | 2000 | Retrofitted from steam to hot water in 2007 |
| Boiler Burn Controller | Honeywell | n/a | 2007 | |
| Boiler Controller | TekMar 256 Boiler Controller | n/a | 2007 | Outdoor temperature reset; warm weather boiler lock out |
| Boiler "Timer" Controller | Honeywell Programmable Thermostat | n/a | 2007 | Appears to be an attempt to control boiler lockout during specific, non-occupied times. All programming overridden at time of assessment, running in full heat mode causing excessive boiler run times. |
| High Limit and Operating Control | Honeywell Aquastats | | | Immersion well mounted |
| Supply Water Temperature Sensor | Tekmar 071 Universal Sensor | -60°F - 255°F | 2007 | Immersion well mounted |
| Outside Air Temperature Sensor | Tekmar 070 Outdoor Air Sensor | -60°F - 140°F | 2007 | Mounted on south side of building; exposed to direct sunlight and non-representative outdoor air temperature conditions |
| Boiler Pumps (Supply and Return Pumps) | Bell and Gossett Series 60 | 3/4 HP | 2007 | Interlocked with boiler; boiler is in "permanent on" position causing boiler pumps to run 24/7. |

The central boiler plant provides all heat for spaces in the original classroom building. Hot water from the boiler is pumped to and from the boiler to individual fan coils in the zones (rooms) served. Because

there is no timer control, currently, these pumps cycle hot water through the distribution system 24-hours per day, seven days per week. A total of 24 fan coils are served by the boiler in the elementary school. Classroom and office air handlers provide outside air (OSA) ventilation directly at the through-wall fan coil. The main floor air handler, located in the attic, provides OSA via ducted opening to the roof. Table 2 details the fan coils observed in the field assessment and from evaluation of building mechanical plans.

Table 4. Ferndale Elementary School Original Building Fan Coil Schedule

| Label | Location | Type | Rating (BTUH) | Vintage | Controls* |
|---------------------------------------|----------------------------------|---|----------------|---------|-------------------------|
| FC-1 | Boy's Toilet (Basement) | Horizontal Cabinet | 13350 | 2007 | Programmable Thermostat |
| FC-2 | Girl's Toilet (Basement) | Horizontal Cabinet | 13350 | 2007 | Programmable Thermostat |
| FC-3 | Corridor (SE Basement) | Vertical Wall-Hung | 16360 | 2007 | Programmable Thermostat |
| FC-4 | Office (NE Workroom) | Vertical Wall-Hung | 22640 | 2007 | Programmable Thermostat |
| FC-5 | Spanish Classroom (Basement) | Vertical Wall-Hung | 28320 | 2007 | Programmable Thermostat |
| FC-6 | Kitchen | Vertical Wall-Hung | 32850 | 2007 | Programmable Thermostat |
| FC-7 | Janitor Supply/Office (Basement) | Vertical Wall-Hung | 31570 | 2007 | Programmable Thermostat |
| FC-8 | Classroom 9 | Vertical Wall-Hung | 82540 | 2007 | Programmable Thermostat |
| FC-9 | Corridor (SW Basement) | Vertical Wall-Hung | 82540 | 2007 | Programmable Thermostat |
| FC-10 | Classroom 7 | Vertical Wall-Hung | 82540 | 2007 | Programmable Thermostat |
| FC-11 | Classroom 8 | Vertical Wall-Hung | 82540 | 2007 | Programmable Thermostat |
| FC-12 | Classroom 1 (Unit A) | Vertical Recessed | 23710 | 2007 | Programmable Thermostat |
| FC-13 | Classroom 1 (Unit B) | Vertical Recessed | 23710 | 2007 | Programmable Thermostat |
| FC-14 | Classroom 6 (Unit A) | Vertical Recessed | 23710 | 2007 | Programmable Thermostat |
| FC-15 | Classroom 6 (Unit A) | Vertical Recessed | 23710 | 2007 | Programmable Thermostat |
| FC-16 | Administrative Office | Vertical Slope-Top | 14790 | 2007 | Programmable Thermostat |
| FC-17 | Principal's Office | Vertical Slope-Top | 14790 | 2007 | Programmable Thermostat |
| FC-18 | Speech | Vertical Slope-Top | 14790 | 2007 | Programmable Thermostat |
| FC-19 | Counseling | Vertical Slope-Top | 14790 | 2007 | Programmable Thermostat |
| FC-20 | Classroom 2 | Vertical Slope-Top | 57000 | 2007 | Programmable Thermostat |
| FC-21 | Classroom 4 | Vertical Slope-Top | 57000 | 2007 | Programmable Thermostat |
| FC-22 | Classroom 5 | Vertical Slope-Top | 57000 | 2007 | Programmable Thermostat |
| FC-23 | Classroom 3 | Vertical Slope-Top | 57000 | 2007 | Programmable Thermostat |
| FC-24 | Main Floor Corridor | Attic Air Handler Coil - Trane BCHC072 | 153070 | 2007 | Programmable Thermostat |
| Total Fan Coil Capacity (BTUH) | | | 1023670 | | |

***Though all of the units detailed in Table 2 are controlled with external programmable thermostats, all observed thermostats were inaccurately programmed for time, setback temperatures and weekly occupancy so were therefore operated only in "override" mode.**

The balance of the systems observed at Ferndale Elementary School consists of self-contained, propane-fired, forced air furnaces. The details of these units can be seen in Table 3.

Table 5. Annex, Gym and Multi-Purpose Room Observed Furnace & Ventilation Schedule

| Location | Make/Model | Rating | Vintage | Controls | Notes |
|--|----------------------------------|--|-------------|--|---|
| Gymnasium (3 parallel units) | Bryant Model 310JAV066135ACJA | 132000 BTUH Input 107,000 BTUH Output Rated Efficiency 81% | November-06 | 1-hour rheostatic timer | OSA damper stuck in full open position; actuator disconnected from linkage |
| Multi-Purpose Room | Bryant Model 376CAV0480960 | 93,750 BTUH Input 75,000 BTUH Output Rated Efficiency 80% | 2006 | Programmable setback thermostat* | No outside air (OSA) provisions at air handler |
| Annex - Classroom 1 & SE Corridor | Bryant Model 376CAV0480960 | 93,750 BTUH Input 75,000 BTUH Output Rated Efficiency 80% | 2006 | Programmable setback thermostat* | No outside air (OSA) provisions at air handler |
| Annex - Classroom 2 | Bryant Model 376CAV036050 | 46,000 BTUH Input 37,000 BTUH Output Rated Efficiency 80% | 2006 | Programmable setback thermostat* | No outside air (OSA) provisions at air handler |
| Annex - Classroom 3 | Bryant Model 376CAV0480960 | 93,750 BTUH Input 75,000 BTUH Output Rated Efficiency 80% | 2006 | Programmable setback thermostat* | No outside air (OSA) provisions at air handler |
| Annex - Classroom 4 | Bryant Model 376CAV036050 | 46,000 BTUH Input 37,000 BTUH Output Rated Efficiency 80% | 2006 | Programmable setback thermostat* | No outside air (OSA) provisions at air handler |
| Annex - Classroom 5 | Bryant Model 376CAV0480960 | 93,750 BTUH Input 75,000 BTUH Output Rated Efficiency 80% | 2006 | Programmable setback thermostat* | OSA retrofitted to common air plenum with C7 system; OSA equipped with mechanical economizer damper controlled by return air temperature |
| Annex - Classroom 6 | Bryant Model 376CAV036050 | 46,000 BTUH Input 37,000 BTUH Output Rated Efficiency 80% | 2006 | Programmable setback thermostat* | No outside air (OSA) provisions at air handler |
| Annex - Classroom 7 | Bryant Model 376CAV0480960 | 93,750 BTUH Input 75,000 BTUH Output Rated Efficiency 80% | 2006 | Programmable setback thermostat* | OSA retrofitted to common air plenum with C5 system; OSA equipped with mechanical economizer damper controlled by return air temperature |
| Teacher Work Room and Reading Room | Bryant Model 376CAV036050 | 46,000 BTUH Input 37,000 BTUH Output Rated Efficiency 80% | 2006 | Programmable setback thermostat* | No outside air (OSA) provisions at air handler |
| Restrooms, Storage, Mechanical room, NW corridor | Bryant Model 376CAV0480960 | 93,750 BTUH Input 75,000 BTUH Output Rated Efficiency 80% | 2006 | Programmable setback thermostat* | No outside air (OSA) provisions at air handler |
| Annex - Classroom 8 | Bryant Model 376CAV036050 | 46,000 BTUH Input 37,000 BTUH Output Rated Efficiency 80% | 2006 | Programmable setback thermostat* | No outside air (OSA) provisions at air handler |
| Annex - Classroom 9, Computer Lab | Bryant Model 376CAV0480960 | 93,750 BTUH Input 75,000 BTUH Output Rated Efficiency 80% | 2006 | Programmable setback thermostat* | OSA provided at air handler |
| Annex - Classroom 10 | Bryant Model 376CAV036050 | 46,000 BTUH Input 37,000 BTUH Output Rated Efficiency 80% | 2006 | Programmable setback thermostat* | OSA provided at air handler |

***Though all of the units detailed in Table 3 are controlled with external programmable thermostats, all observed thermostats were inaccurately programmed for time, setback temperatures and weekly occupancy so were therefore operated only in “override” mode.**

In addition to the thermostat issues and specific conditions noted in the “Notes” section of Table 3, the following adverse conditions were noted in the Annex HVAC systems.

- Flex ducting used for all duct runs – Flex ducting is typically reserved for connection points (within 5’ feet of registers) with rigid ducting making up the majority of the distribution system. Flex ducting tends to restrict air flow reducing the amount of air (heated) reaching the conditioned space. Though replacing flex ducting with rigid is not typically an economically viable condition, school staff and administration should be aware of this issue for future projects.



Figure 6. Image showing large amounts of flexible ducting used in Annex HVAC systems.

- Duct leakage at plenum – Large gaps were observed in the furnace return air plenums and flex ducting connection points. These gaps allow attic air to enter the system. Duct leakage of this nature has both energy efficiency and indoor air quality implications.



Figure 7. Image detailing duct leakage location at return air plenum/flex duct connection point.

- Outside air (OSA) intake damper in Gymnasium is in permanently open position and actuator linkage is disconnected and the actuator appears non-functional. These conditions allow a significant proportion of outside air to enter the return air stream even when ventilation air is not required (i.e. during morning start-up). This condition lowers return air temperatures and causes the furnaces to run more than necessary to achieve set-point supply air temperatures.



Figure 8. Image showing elementary school gym OSA damper in fully open position.

Domestic Hot Water

The domestic hot water load is limited to the kitchen in the original classroom building, and the staff room and staff restrooms in the Annex. The following equipment was observed during the field assessment.

Table 6. Ferndale Elementary School Domestic Hot Water Schedule

| Location | Make/Model | Fuel | Rating | Vintage |
|-----------------|-------------------|-------------|------------------------|----------------|
| Boiler Room | Rheem/Rudd | Electric | 9 kW, 120 Gallons | Nov-08 |
| Annex Storage | Rheem/Rudd | Propane | 30,000 BTUH, 30-gallon | 2006 |

- The hot water line from the boiler room to the kitchen is equipped with a trace heating cable (Raychem Rayclic) used for hot water temperature maintenance so that hot water is available at the tap immediately when the demand occurs. From product specifications and an estimated cable length of 40' in the elementary school, we estimate that this unit uses approximately 240-watts of power for an estimated cost of approximately \$350 per year.

Other Energy Using Systems of Note

Plug Load – Annex Computer Lab – The computer lab is equipped with Mac computers that have a relatively high energy efficiency rating. OE estimates that the total “phantom” load associated with these computers in “idle” mode is 1,400 watts. When this power use is multiplied by 24 hours per day, 180 days per year, the annual cost is approximately \$1,000. Therefore, these computers should be programmed to turn off after hours and when the lab is not occupied.

2.6 Ferndale High School – General Site Information



Figure 9. Aerial View of Ferndale High School Campus

Ferndale High School contains three separate buildings comprising approximately 42,958 square feet of conditioned space. These facilities include:

- Classrooms and Administrative Offices – 20,773 square feet of conditioned space containing 11 classrooms, library, staff kitchen, and server room, restrooms, and administrative and counseling offices.
- Gymnasium – 17,535 square feet of conditioned space that includes basketball court, wrestling room, girls' and boys' locker rooms, boiler room and entry foyer. This facility was constructed in 1975.
- Shop Class and Ag Building – 4,650 total square feet containing approximately 3,650 square feet of conditioned shop space used for classes and approximately 800 square feet of unconditioned shop space referred to as the Ag Building. The age of this building was not determined.

2.7 Ferndale High School – Building Occupancy

Ferndale High School is also the site of the District Office and has average student and staff occupancy of 250-300. The main classroom facilities are occupied Monday through Friday, 7:00 a.m. to 4:00 p.m. with sporadic after hours and weekend hour occupancy by teachers, clubs and staff. The Gymnasium is used for physical education and extracurricular sports so is occupied for relatively short periods daily for classes, and after hours and weekends depending on the sports schedule.

2.8 Ferndale High School – Building Envelope

This section provides information on any adverse conditions of building envelope elements noted during the field assessment. Envelope elements evaluated for this assessment include exterior walls, fenestration (doors and windows), attics, roofs and crawlspaces.

Classrooms and Administrative Offices

The Classrooms and Administrative Offices at the high school were constructed in phases beginning in 1952. They are constructed of conventional wood-framing on a concrete slab foundation with stucco siding.

- Exterior Walls – Though no destructive testing was completed at the high school, no evidence of wall insulation was noted in field assessment. This is also consistent with the construction practices at the time of original construction. Though this is not an optimal condition, retrofitting wall insulation is typically not an economically viable solution due to installation requirements and low associated aggregate energy savings.
- Fenestration
 - Most of the glazing noted consists of wood-framed, single-paned windows. The western exposed windows in the main office and superintendent office (southwest corner of facility) have aluminum uninsulated metal frames, but still have only single panes of glass.
 - Due to the orientation of the facility combined with high ceilings (12'), there is a significant amount of north facing, single-paned glazing, which leads to a large amount of heat loss due to conduction and air leakage.



Figure 10. Image showing large facade of north facing single paned glazing.

- Exterior doors consist largely of full-light and half-light glass doors. Exterior weather stripping on these doors was non-existent or damaged.
- Attic
 - The attic space is insulated with redwood bark to a depth of approximately 3". This material is likely original to the construction of the facility and is significantly degraded (dried and compacted). The R-value of this material in its current condition is very low. Though common for the construction era and for the Northern California locality, **this material is no longer appropriate for insulation and could represent a hazard.**



Figure 11. Photo depicting existing redwood bark insulation in Classroom and Administration Building attic.

- Access to the attic is limited to two known points which complicates entrance to the entire space which may have an impact on implementing insulation retrofit projects.
- **NOTE: Fire doors in the attic space have been wired open. This leads to a hazardous condition. Wires holding doors open should be removed and fire doors kept closed.**
- Roof – The roof on this facility is pitched with vented gable ends and soffit vents. The roof is clad with asphalt, 3-tab roofing material. This material is reaching the end of its serviceable life with obvious signs of deterioration including lifted, missing and/or damaged tabs, signs of patching around roof penetrations, areas where aggregate shows significant wear in roofing material, exposed fiberglass backing material and significant moss growth.

Gymnasium

The high school gymnasium was opened in 1976. This facility constructed of a combination of concrete masonry unit (CMU) walls (locker rooms, boiler room, perimeter) and conventional steel-framing and wood-framing above the CMU perimeter (basketball court) built on a concrete slab foundation. This building has a combination of exposed CMU walls, tongue-and-groove jointed wood siding and T-111 type sheet siding.

- Exterior Walls – No wall insulation was observed in the high school gymnasium. Though this is not an optimal condition, retrofitting wall insulation is typically not an economically viable solution due to installation requirements and low associated aggregate energy savings.
- Fenestration
 - Windows in the gym consist largely of singled paned, aluminum framed “storefront” type glazing.
 - Exterior doors consist largely of a combination of insulated steel and full-light glass doors. Exterior weather stripping on these doors was non-existent or damaged.



Figure 12. Image illustrating missing weatherstripping on Gym exterior door.

- Attic
 - The attic space above the locker rooms is insulated with fiberglass batts. This material is likely original to construction shows obvious signs of deterioration. The estimated effective R-Value of this material is R-19.
 - The ceiling in the basketball court area is vaulted. No indication of insulation was noted in the ceiling or roof deck construction.
- Roof
 - The roof of the Gymnasium has three levels. The lowest level covers the locker rooms, entry foyer and common areas, mid-level roof covers the wrestling room, and the upper level area covers the basketball court area. All of these roofs are roofed with an asphalt “torchdown” type material that is beginning to show signs of age and deterioration due to debris buildup, standing water, age and exposure. However, no significant material breaches were observed in the field assessment.



Figure 13. High School Gymnasium roof detailing configuration and maintenance issue around drainage scupper.

- The lower two levels are “flat” with very slight slopes to provide drainage via perimeter scuppers and downspouts which discharge to a subsurface location. The roof over the basketball court is pitched on four sides to drain to perimeter drainage infrastructure.
- Vegetation growth was noted at virtually all roof drainage locations (scuppers). This condition can lead to premature roof degradation at these locations and should be added as a routine maintenance item for staff.

Shop Class and Ag Building

According to the Ferndale Unified School District Needs Assessment Report (2012) the Shop Class and Ag Building were constructed in the late 1970s. These facilities share a common wall at the north end of the Shop Class. The Shop Class is considered “conditioned space” (heated) while the Ag Building is “unconditioned”. Both of these facilities are metal buildings with metal roofs. No significant issues were noted in the Shop Class envelope. The Ag Building shows signs of age with unsealed penetrations in the walls and deteriorating window seals, however, because it is “unconditioned”, no energy conservation measures were noted.

2.9 Ferndale High School – Energy Using Systems

Lighting Systems

The vast majority of the lighting at Ferndale High School is provided by 32-watt (4’), T-8 lamps in two to four lamp recessed or surface mounted fixtures. Gymnasium lighting is provided by a combination of 32-watt (4’), linear fluorescent T-8 lamps in twenty, 4-lamp, suspended fixtures and five 1000-watt

metal halides. The metal halides and fluorescent lamps are controlled by two separate circuits. No lighting occupancy sensors were noted at the high school during the field assessment.

Heating, Ventilation and Air-Conditioning (HVAC)

Ferndale High School heating and ventilation is provided by several systems serving the three buildings and multiple zones. There is no mechanical cooling at the elementary school. Tables 7-9 detail the systems identified during the field assessment.

Table 7. Ferndale High School - Gymnasium Boiler Partial Equipment Schedule

| Component | Make/Model | Rating | Vintage | Notes |
|--------------------------------------|---|------------------------------|---------|---|
| Boiler | Peerless Model 0-715-FD-WHP | | 1979 | Retrofitted from oil to propane |
| Boiler Propane Burner and Controller | Gordon-Piatt Energy Group R8.2-G-07 | 2,121 kBTUH Propane Fired | 2007 | Retrofit burner |
| High Limit & Operating Control | Honeywell Aquastats | n/a | 1979 | |
| Boiler Pump | Bell and Gossett Series 60 | 3/4 HP | 1979 | Interlocked with with air handler fans. Pump runs when air-handlers are activated by manual rheostat timer. |
| Boiler Pressure Relief Valve | | | | Valve is leaking hot boiler water when boiler is firing. |

A central boiler plant was originally designed and constructed to provide all heat for domestic water and conditioned zones within the Gymnasium. Hot water from the boiler is pumped to two fan coils (air handlers) associated with the zones served. According to staff, the air handlers are operated approximately 2 hours per day during the heating season.

Table 8. Ferndale High School - Gymnasium Fan Coil Schedule

| Label | Location/Zone Served | Type | Rating (BTUH)/ Fan HP | Vintage | Controls | Notes |
|-------|---|--------------------|--------------------------|---------|-----------------------|--|
| FC-1 | Gym Boiler Room/Boys and Girls Locker Room | Horizontal Cabinet | Unknown/5 HP | 1976 | Manual Rheostat Timer | Fan coil fins have been damaged from broken fan belt. |
| FC-2 | Roof Deck Above Wrestling Room/Basketball Court | Horizontal Cabinet | Unknown/10 HP | 1976 | Manual Rheostat Timer | Non-Functional yet hot water still runs to this unit when main timer is activated; thermosyphoning also occurring |

In addition to the issues and specific conditions noted in the “Notes” section of Tables 5 and 6, the following section provides more detail to the adverse conditions were noted in the Gymnasium HVAC systems.

- The roof top fan coil unit is in extreme disrepair and is not used. However, thermal imaging of this unit indicates that the when the main pump for the Gym heating system is activated, hot water flows through this unit's heat coil. This is a significant source of heat loss through the system. Additionally, even when the boiler pump is not running, significant pipe heat loss occurs at this unit via thermosiphoning. Specific maintenance issues associated with this unit include:
 - Failed and torn seals
 - Significant corrosion on intake, fan coil, cabinet, and appurtenances.
 - Generally inoperable condition



Figure 14. Image showing destroyed seal on Gym rooftop fan coil/air handler (AHU).



Figure 15. Image showing significantly corroded high school gym roof top AHU outside air intake screen and cabinet.

- Outside air (OSA) intake damper on the only functional air handler (Gym FC-1) is in permanently open position. This allows a significant proportion of outside air to enter the return air stream even when ventilation air is not required (i.e. during morning start-up). This condition lowers return air temperatures and causes the boiler to run more than necessary to achieve set-point supply air temperatures.

The balance of the heating systems observed at Ferndale High School consists of self-contained, propane-fired, forced air furnaces and propane fired unit heaters. The details of these units can be seen in Table 6.

Table 9. Classroom and Administration, Shop Class Observed Furnace & Ventilation Schedule

| Location | Make/Model | Rating | Vintage | Controls | Notes |
|--|--------------------------------------|--|---------|----------------------------------|--|
| Classroom 1 | Lennox Pulse Furnace G14Q4-80-11 | Propane Fired 80,000 BTUH Input 74,000 BTUH Output Rated Efficiency 92.5% | 1986 | Non-Programmable Thermostat | n/a |
| Classroom 2 | Lennox ML193UH090XP36C-04 | Propane Fired 88,000 BTUH Input 83,000 BTUH Output Rated Efficiency 94.3% | 2013 | Programmable setback thermostat* | n/a |
| Main/Bus. Office and Superintendent's Office | Lennox Pulse Furnace G14Q4-80-11 | Propane Fired 80,000 BTUH Input 74,000 BTUH Output Rated Efficiency 92.5% | 1986 | Programmable setback thermostat* | OSA provided via rooftop intake. No damper. Gas leak identified main supply and flexible gas line connection. |
| Library | Lennox ML193UH090XP36C-04 | Propane Fired 88,000 BTUH Input 83,000 BTUH Output Rated Efficiency 94.3% | 2012 | Programmable setback thermostat* | |
| Counselor's Office and Home Economics | Lennox ML193UH090XP36C-04 | Propane Fired 88,000 BTUH Input 83,000 BTUH Output Rated Efficiency 94.3% | 2010 | Programmable setback thermostat* | |
| Classrooms 7 and 8 | Lennox ML193UH090XP36C-04 | Propane Fired 88,000 BTUH Input 83,000 BTUH Output Rated Efficiency 94.3% | 2010 | Programmable setback thermostat* | OE to verify |
| 2nd Classroom 6 | Lennox Pulse Furnace G14Q4-80-11 | Propane Fired 80,000 BTUH Input 74,000 BTUH Output Rated Efficiency 92.5% | 1986 | Non-Programmable Thermostat | |
| Classroom 9 | Assumed Lennox ML193UH090XP36C-04 | Propane Fired 88,000 BTUH Input 83,000 BTUH Output Rated Efficiency 94.3% | 2012 | Programmable setback thermostat* | |
| Classroom 10 | Lennox ML193UH090XP36C-04 | Propane Fired 88,000 BTUH Input 83,000 BTUH Output Rated Efficiency 94.3% | 2010 | Programmable setback thermostat* | |
| Classroom 11 | Lennox Pulse Furnace G14Q4-80-11 | Propane Fired 80,000 BTUH Input 74,000 BTUH Output Rated Efficiency 92.5% | 1986 | Non-Programmable Thermostat | Gas leak detected at furnace regulator |
| Classroom 12 | Lennox ML193UH090XP36C-04 | Propane Fired 88,000 BTUH Input 83,000 BTUH Output Rated Efficiency 94.3% | 2010 | Non-Programmable Thermostat | |
| Classroom 13 | Lennox Pulse Furnace G14Q4-80-11 | Propane Fired 80,000 BTUH Input 74,000 BTUH Output Rated Efficiency 92.5% | 1986 | Programmable setback thermostat* | |
| Shop Class | Modine Unit Heater | Propane Fired 54,000 BTUH Rated Efficiency 82% | 1995 | Non-Programmable Thermostat | |

***Though many of the units detailed in Table 6 are controlled with external programmable thermostats, all observed thermostats were inaccurately programmed for time, setback temperatures and weekly occupancy so were therefore operated only in “override” mode.**

In addition to the thermostat issues and specific conditions noted in the “Notes” section of Table 3, the following adverse conditions were noted in the high school HVAC systems.

- Although the stand-alone furnaces in the classroom and administration building are equipped with outside air (OSA) dampers/actuator pairs all of the dampers are in the full open position and the actuators do not appear to be functional. This allows a significant proportion of outside air to enter the return air stream even when ventilation air is not required (i.e. during morning start-up and/or unoccupied periods). During the heating season, this condition lowers return air temperatures and causes the furnace to run more than necessary to achieve set-point room temperatures.

Domestic Hot Water (DHW)

The domestic hot water load at the high school is limited to showers in the boy’s and girl’s locker rooms in the gymnasium and the teacher’s kitchen in the main classroom building. The following DHW equipment was noted in the high school

Table 10. Ferndale High School – Domestic Hot Water Schedule

| Location | Make/Model | Fuel | Rating | Vintage |
|-------------------|--|-----------------------|-------------------------|----------------|
| Boiler Room | Passive storage tank | Heated from boiler HX | 400-gallons | original |
| Boiler Room | Circulation Pump - Bell and Gossett, Model 189105LF Circulation Pump | Electric | 1/4 HP | Unknown |
| Teacher's Kitchen | In-Sink-Erator Model W152 Point of Use Water Heater | Electric | 1,500-watts, 2.5 gallon | 1998 |

- Domestic hot water in the gymnasium is provided from a hot water loop that is pumped from the boiler through a heat exchanger in a 400-gallon storage tank. The pump is controlled by a relay that triggers pump operation when the tank temperature reaches 125°F. Tank temperature at the time of the field assessment was in excess of 140°F indicating that the sensor associated with the pump relay is either faulty, or in need of calibration. According to staff, showering during normal high school hours is nearly non-existent (as was evidenced by clothing noted in both the boy’s and girl’s showers); and is basically limited to visiting sports teams who “sometimes” use showers after games.



Figure 16. Ferndale High School Gym 400-gallon DHW storage tank.

Other Energy Using Systems of Note

Plug Load – The computer lab is equipped with Mac computers that have a relatively high energy efficiency rating. OE estimates that the total “phantom” load associated with these computers in “idle” mode is 1,400 watts. Though not a huge number in magnitude, when multiplied by 24 hours per day, 180 days per year, the annual cost is approximately \$1,000. Therefore, these computers should be programmed to turn off after hours and when the lab is not occupied.

Process Load – The Shop Class is equipped with the following process loads of note:

- Delta 5 HP dust collector – Manually controlled
- Unknown brand ~ 5 HP dust collector – Manually controlled
- Jet 1.5 HP dust collector – Manually controlled
- Air Compressor equipped with a 10 HP motor – Manually controlled
 - This unit cycled 3 times during our brief inspection period indicating that there are significant air system leaks.
 - The tank was purged during inspection and a significant amount of water was observed in purge stream. This can lead to premature deterioration of the tank.



Figure 17. Image showing liquid condensate in Shop Class compressor purge stream.

3 Site Energy Use and Costs

This section provides a review of historical electricity, propane and fuel oil consumption data for the elementary and electricity and propane consumption for the high school. Electricity is provided to both sites by Pacific Gas and Electric. Fuel oil is provided to the elementary school by Renner Petroleum. Sequoia Gas provides propane to both the high school and elementary school.

3.1 Ferndale Elementary School - Total Cost of Energy

Based on approximately three years of electricity and propane data (2012 – 2014) and two years of fuel oil data (2013-2014), the average annual energy costs for the elementary school is approximately \$41,600. Figure 2 below shows clear correlation to seasonality in both propane and fuel oil, with essentially no heating cost during summer. It is noteworthy that electric costs climb steeply in the spring and fall months. This is not attributable to higher consumption but rather to higher utility charges for electricity use and power demand which occurs between May 1 and October 31.

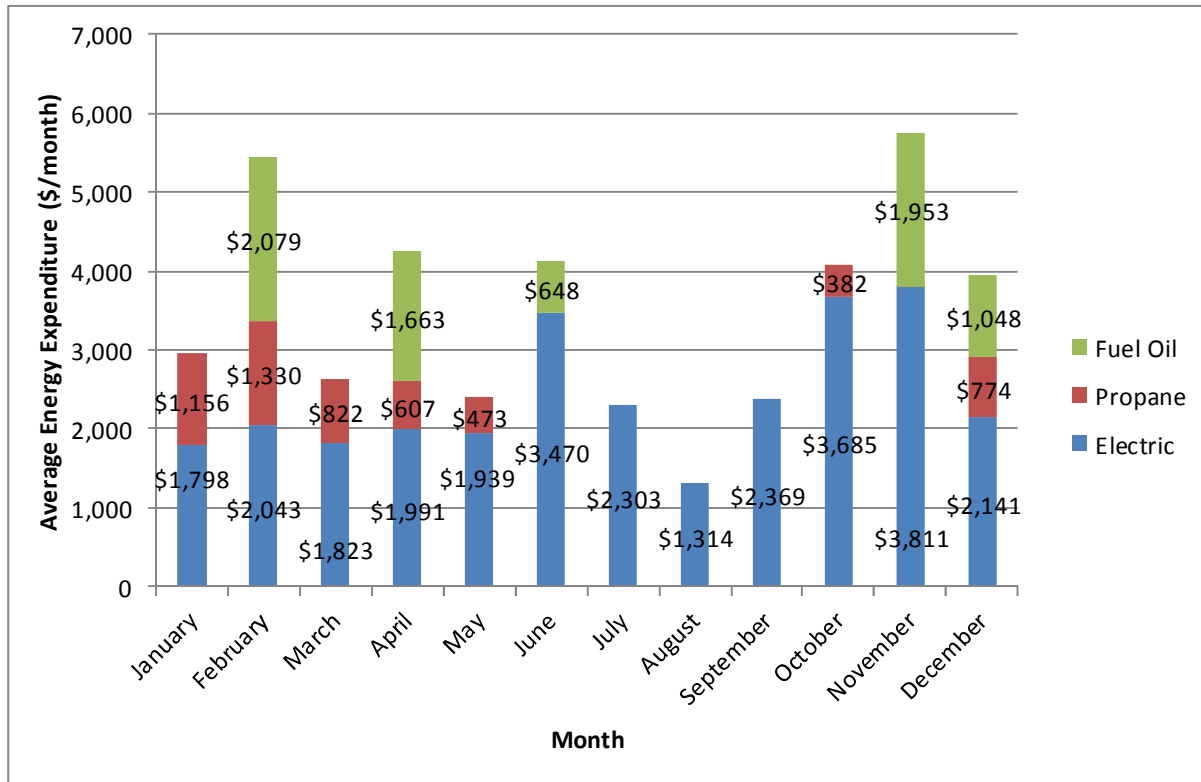


Figure 18. Ferndale Elementary School - Average Annual Energy Expenditures

Figure 19 details the proportion of total energy costs associated with each “fuel” type used at the elementary school (electricity, fuel oil, propane).

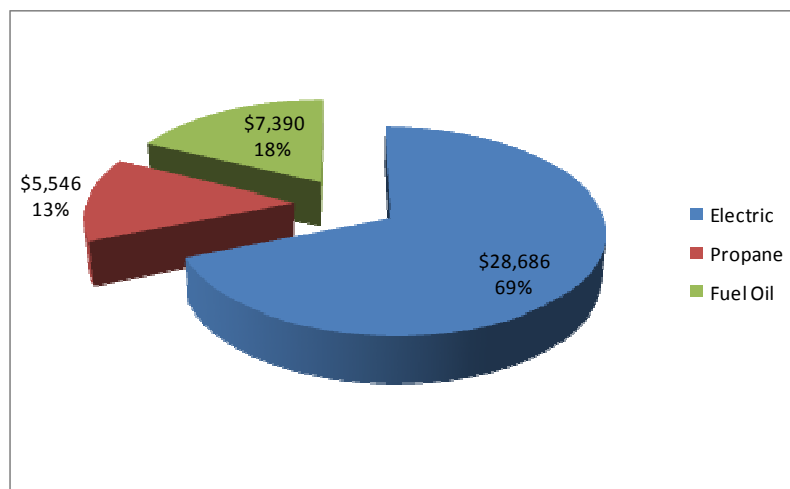


Figure 19. Ferndale Elementary School - Energy Expenditure Proportions by Fuel Type

As can be seen in Figure 19, just over two-thirds of the Ferndale Elementary School energy costs are for electricity. The fuel oil cost to run the boiler in the Original Classroom Building is notably higher than the propane costs required to heat both the Annex and the Gym and Multi-Purpose Room. This

indicates that there may be a significant opportunity to achieve energy savings by better controlling the boiler.

3.2 Ferndale Elementary School – Energy Benchmarking and Average Annual Energy Consumption Profile

Ferndale Elementary School uses 25.43 kBtu/sf/year compared to a benchmark of 17.85 kBtu/sf/year, or 42% more energy than would be expected from the same type and size of education building that utilizes non-electric heating fuel in the same climate zone.

The figure below details the average monthly energy use profile for Ferndale Elementary.

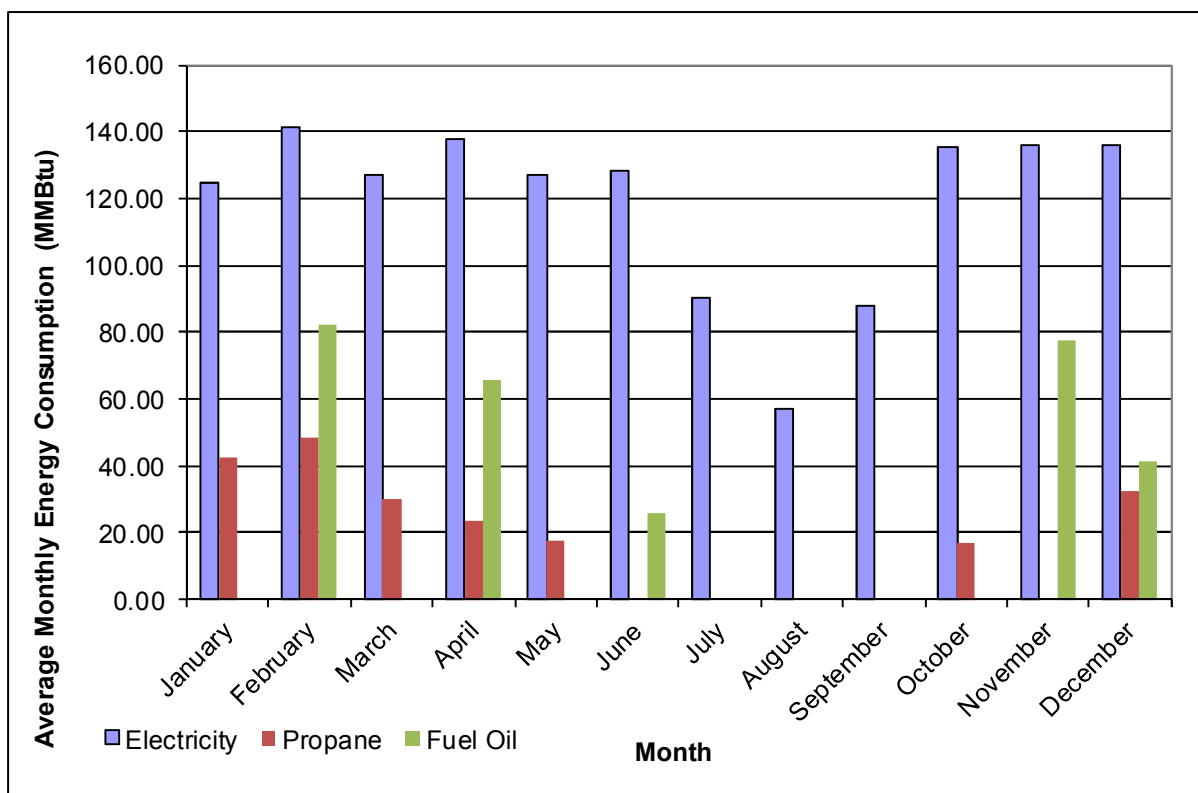


Figure 20. Ferndale Elementary School - Average Monthly Energy Consumption

Figure 20 shows relatively flat electrical energy use profile during the school year. Significant variations are seen from month to month in both propane and fuel oil “usage”. This corresponds in part to seasonality but is also largely due to the irregular nature of fuel oil and propane deliveries. There is a decline in both heating energy and electric energy consumption during summer months with only a slight decline in electrical energy use seen during the December holiday break when the school is unoccupied.

Figure 21 illustrates Ferndale Elementary School’s energy consumption by end-use category as determined by the energy performance model created for the school.

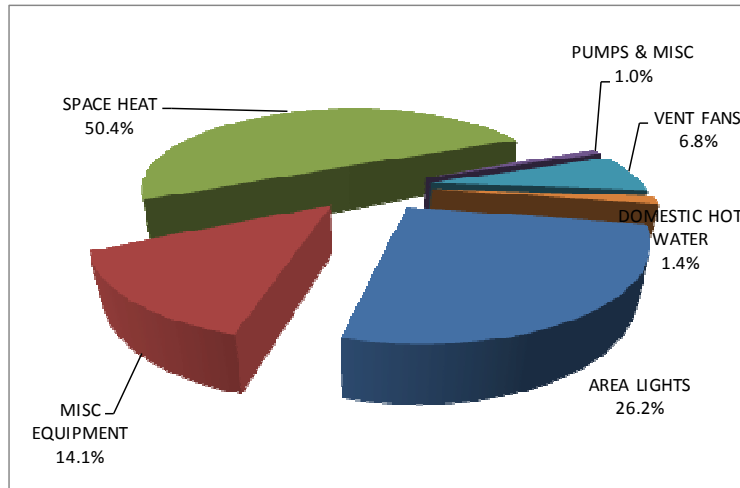


Figure 21. Ferndale Elementary School combined energy consumption by end-use category.

As can be seen in Figure 21, Space Heating makes up the largest energy use sector for the Ferndale Elementary School campus and makes up a larger proportion of the total energy budget than would be expected in a similar building in this climate zone. This further supports that energy efficiency opportunities associated with heating systems may yield the most significant results.

3.3 Ferndale High School - Total Cost of Energy

Based on approximately three years of electricity data (2012-2014) and one year of propane data (2013 –2014) the average annual energy cost for the high school is approximately \$50,300. Figure 22 illustrates average monthly utility billing for the high school.

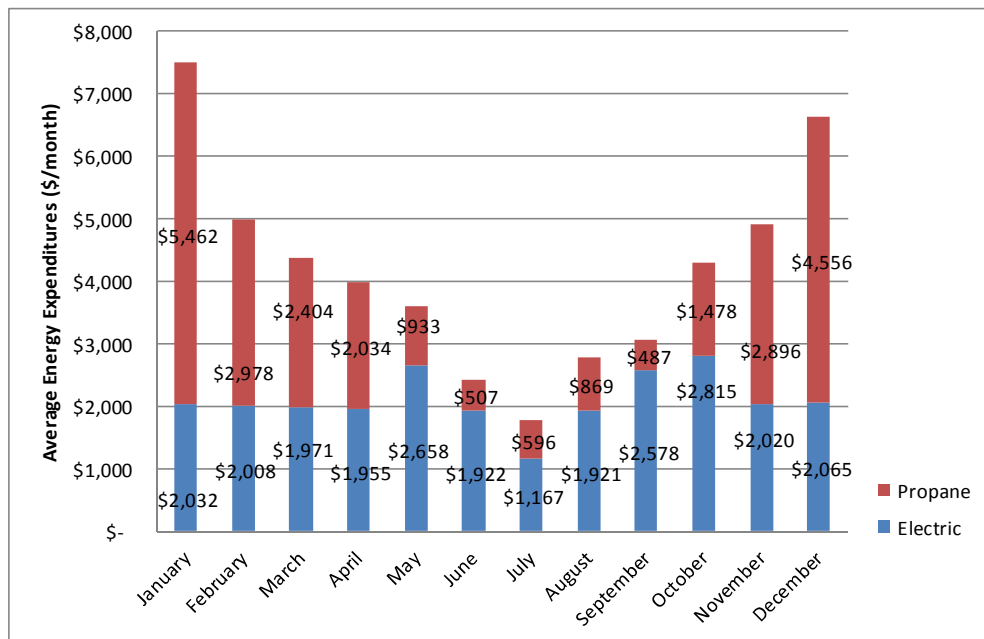


Figure 22. Ferndale High School - Average Annual Energy Expenditures

Figure 22 shows clear correlation to seasonality in propane deliveries, but it is notable that even when there is little or no heating demand the school is still paying over \$500 per month for propane. This is likely due to limited control of space heating and domestic water heating systems during unoccupied periods. As with the elementary school, it is noteworthy that electric costs climb steeply in the spring and fall months. This is not attributable to higher consumption but rather to higher utility charges for electricity use and power demand which occurs between May 1 and October 31.

Figure 23 details the proportion of total energy costs associated with each “fuel” type used at the high school (electricity, propane).

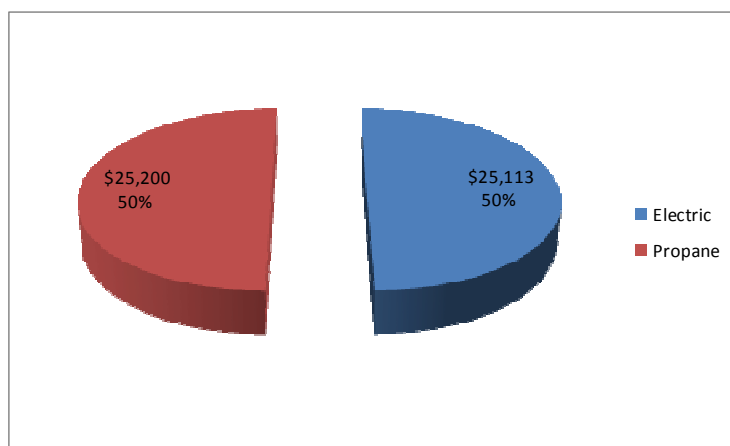


Figure 23. Ferndale High School - Energy Expenditure Proportions by Fuel Type

As can be seen in Figure 23, annual electricity and propane billing are split evenly. Heating costs for most school buildings in the same climate zone typically do not represent this large of a proportion of the total energy budget. This points to a significant opportunity to achieve savings through a number of measures involving both the gym boiler and the classroom furnace systems, as well as improving the building envelope to reduce heating loads.

3.4 Ferndale High School - Energy Benchmarking and Average Annual Energy Consumption Profile

Ferndale High School uses 32.85 kBtu/sf/year compared to a benchmark of 17.85 kBtu/sf/year, or 84% more energy than would be expected from the same type and size of education building that utilizes non-electric heating fuel in the same climate zone. Figure 23 details the average monthly energy use profile for Ferndale High School.

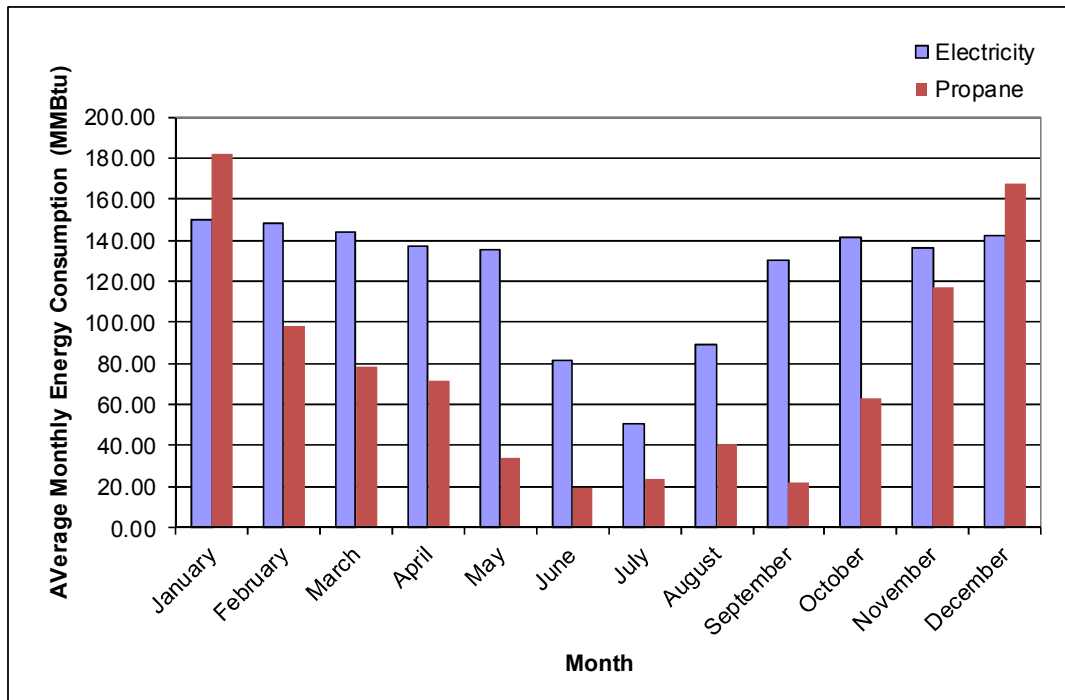


Figure 24. Ferndale High School - Average Monthly Energy Consumption

As can be seen in Figure 24, the data provided for Ferndale High School show significant variations from month to month that correspond in part to seasonality but also largely to the irregular nature of propane deliveries. There is a decline in both heating energy and electric consumption during summer months when the school is largely unoccupied, however there is still a significant heating base load during these unoccupied periods. This may be attributable to the lack of controls on the gymnasium domestic water heating system and uncontrolled classroom heating systems. Many schools show a notable dip in energy use billing in January that likely corresponds to the two week long Christmas break but that dip is notably missing in the high school.

Figure 25 illustrates Ferndale High School's energy consumption by end-use category as determined by the energy performance model created for the school.

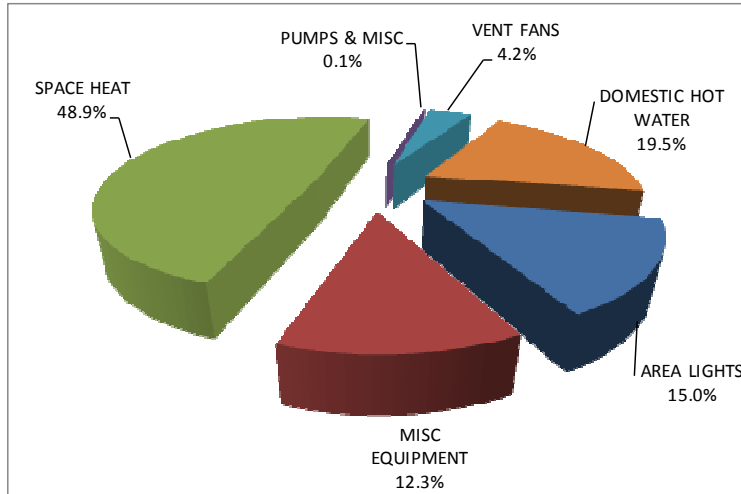


Figure 25. Ferndale High School combined energy consumption by end-use category.

As can be seen in Figure 25, Space Heating makes up the largest energy use sector for the Ferndale High School campus and makes up a larger proportion of the total energy budget than would be expected in a similar building in this climate zone. Additionally, significant energy is expended by the Gymnasium domestic water heating system.

4 Energy Project Opportunities

4.1 Energy Analysis Methodology

ASHRAE Level II Energy Audit

An ASHRAE Level II Energy Audit was performed on-site to collect nameplate, operational and building performance data for energy consuming equipment and conditions, and to identify potential energy efficiency measures. During the site visit, engineers collected the following information:

- Building envelope conditions and configurations
- Lighting types, counts and controls
- Mechanical systems nameplate specifications, configurations and controls
- Significant plug or process load data
- Drawings indicating envelope and mechanical configurations of existing buildings
- Observations and photographs of adverse conditions and controls that may affect building and campus energy use

In addition to data collected during on-site energy evaluations, OurEvolution (OE) engineers deployed data loggers to quantify representative run times of primary mechanical equipment. Data was logged at one-minute intervals for periods of at least one week. The following equipment was monitored:

- Ferndale High School boiler burner fan
- Ferndale High School domestic hot water loop pump
- Ferndale Elementary School boiler burner fan
- Ferndale Elementary School boiler supply and return pumps

As per ASHRAE guidelines, the following measure types were analyzed:

- No-Cost/Low-Cost Measures (LCM)
- Practical Capital Intensive Measures (CIM)

Though not specifically required by ASHRAE, the following measures are also discussed in this section:

- Health and Safety Issues (HSM)
- Maintenance Issues (MM)

Per ASHRAE guidelines, all proposed measures were discussed with building managers prior to analyses to determine if they fit with the long term planning for the building and operations.

Any measure requiring more data collection, analysis, destructive testing, or deemed impractical by OE engineers or building managers are listed and briefly described in Section 4.5 and 4.9 – Energy Measures Considered But Not Analyzed

Measure Order

There are interactive effects among several of the measures considered for this analysis that may over- or under-estimate the savings for an individual measure. When reviewing the results of this report, please note that actual energy savings of individual measures may be more or less than estimated for this report depending on the entire package of measures actually implemented.

Building Energy Performance Modeling

Building energy performance was modeled using EnergyPro version 5.1. This program uses the DOE-2.1E hourly simulation tool, distributed by the Department of Energy, as the calculation engine. The DOE-2.1E simulation engine is considered to be one of the most accurate simulation tools for this application, and evaluates energy use and peak demand requirements on an hourly basis over the course of a representative “average” weather year compiled from 20 years of climate data for the region in question. EnergyPro reports projected net annual building performance, as calculate by DOE-2.1E. Building energy performance modeling was used to estimate energy savings for most envelope and mechanical system measures.

Spreadsheet Models

Where building energy performance modeling could not provide adequate capabilities for estimating energy savings for specific systems or conditions, spreadsheet models were developed using best engineering practices. Where possible, OE engineers used the California Energy Commissions energy savings calculators developed for the Proposition 39 program.

Cost Estimating

Cost estimates were completed using best engineering practices including:

- Where possible receiving budget level cost estimates from local contractors and/or suppliers
- Receiving budget level cost estimates from manufacturers and/or regional equipment representatives
- Calculating budget level estimates using R.S. Means Construction Cost database
- Estimating costs based on past projects

Economic Evaluation

The following economic factors were calculated:

- Savings-to-Investment Ratio (SIR) – Based on California Energy Commission SIR Calculator for Proposition 39
 - Energy Escalation Rate – 4 percent
 - Discount Rate – 5 percent
 - Inflation Rate – 2 percent
- Simple Payback - Capital Cost of Measure divided by Annual Energy Savings

4.2 Ferndale Elementary School (FES) - Low-Cost/No-Cost Measures (LCM)

No-cost/low-cost measures are energy conservation, energy efficiency, or time-of-use management projects that require up to \$1,000 dollars capital investment and/or internal time and effort required by on-site maintenance personnel.

LCM-1: FHS - Repair Pressure Relief Valve (PRV) on Original Classroom Building Boiler

| Estimated Annual Savings | | | Estimated Capital Costs/Payback | | |
|--------------------------------------|---------------------------------|-------------------------------------|---------------------------------|------|------------------------|
| Electrical Energy Savings (kWh/year) | Fuel Oil Savings (gallons/year) | Total Energy Cost Savings (\$/year) | Net Measure Cost (\$) | SIR | Simple Payback (years) |
| Nominal | 193 | \$495 | \$367 | 9.82 | 0.41 |

Observations

OE engineers noted that a significant flow of ~160°F water leaking from the PRV line to a floor drain. The leak was only observed when the boiler was firing and OE estimates the flow of this leak in excess of one gallon per minute at all times when the boiler is firing. School staff collected in excess of 5 gallons over a two hour period. It is unknown how long this leak has been occurring, but apparently this is a primary contributor to what had previously been assumed by staff to be groundwater or rainwater runoff collecting in a subsurface sump over a period going back at least several months. Based on the volume of water collected during the "bucket" test along with monitoring data reflecting the duration and frequency of boiler operation, it is conservatively estimated that the PRV is discharging a minimum of 60 gallons of hot water per day.

Recommendations

OE recommends replacing the faulty PRV valve.

Energy Savings and Assumptions

Energy and water savings were estimated using the Water Leak Cost Calculator by the Food Service Technology Center in partnership with PG&E at www.fishnick.com/savewater/tools/leakcalculator. This calculator also includes the cost of water delivery as part of the annual cost savings.

LCM-2: FES - Install Boiler Timer and Relocate Outdoor Air Temperature Sensor

| Estimated Annual Savings | | | Estimated Capital Costs/Payback | | |
|--------------------------------------|--------------------------------|-------------------------------------|---------------------------------|-------|------------------------|
| Electrical Energy Savings (kWh/year) | Propane Savings (gallons/year) | Total Energy Cost Savings (\$/year) | Net Measure Cost (\$) | SIR | Simple Payback (years) |
| Nominal | 414 | \$1,084 | \$412.50 | 13.82 | 0.38 |

Observations

The FES boiler is currently serving the Original Classroom Building heating demands. Two circulating pumps, one each on the hot water return and hot water supply, run 24 hours per, day 7 days per week. Boiler operation is triggered whenever the circulating water temperature falls below the 160°F set point, which, according to logger data occurs approximately once per hour even when there is no call for heat in the building. Consequently a great deal of fuel oil is expended simply to keep the system hot even when there is no heating demand.

Additionally, the outdoor air temperature sensor which, in theory, should also be used as a boiler lockout control is located on the south side of the building in an area of full sun. It is unclear if information for this sensor is currently being used for boiler setback control.

Recommendations

OE recommends considering installing a timer on the boiler electrical controls that will disable the boiler during un-occupied periods. Additionally, OE recommends moving the outdoor air temperature sensor to a more representative location (shaded) and that outdoor air temperature reset controls are set in the control logic.

Energy Savings and Assumptions

Energy savings were calculated based on unoccupied period (6 pm to 6 am) run times observed in data logged from boiler fan run times and the boiler rated capacity. Boiler run time data was normalized to provide “average” daily unoccupied period run times throughout the year.

LCM-3: FES – Install New Aquastats and Lower Boiler Water Temperature

| Estimated Annual Savings | | | Estimated Capital Costs/Payback | | |
|--------------------------------------|--------------------------------|-------------------------------------|---------------------------------|------|------------------------|
| Electrical Energy Savings (kWh/year) | Propane Savings (gallons/year) | Total Energy Cost Savings (\$/year) | Net Measure Cost (\$) | SIR | Simple Payback (years) |
| Nominal | 78 | \$370 | \$534 | 3.50 | 1.44 |

Observations

The Main Classroom Building's boiler water temperature set points are between 160°F and 180°F. These temperatures are unnecessarily high for the current building heating and domestic water heating demands. Thermometers mounted on the boiler supply and return lines indicate that actual water temperatures may be higher than set points and it is unknown when the last calibration of the Honeywell aquastats temperature sensors was performed. Higher temperatures in circulating heating hot water may be a factor contributing to overheating and resultant poor occupant comfort levels in some spaces.

Recommendations

OE recommends performing temperature sensor calibration and lower boiler set points to maintain temperature between 140°F and 160°F. Lower heating hot water temperatures may provide more control over room temperatures since the fan coil ventilators will have longer run times but fewer cycles. Boiler water temperature should be lowered in stages to ensure that temperatures do not reach below 140°F. Low temperature boiler water return can cause condensation within the burner which may damage boiler components.

Energy Savings and Assumptions

Energy savings are based on literature estimates of 5% reduction in energy use per 10 degree decrease in set point temperature.

LCM-4: FES - Remove Heat Tracer on Domestic Hot Water Pipe

| Estimated Annual Savings | | | Estimated Capital Costs/Payback | | |
|--------------------------------------|-------------------------------|-------------------------------------|---------------------------------|-------|------------------------|
| Electrical Energy Savings (kWh/year) | Electrical Savings (kWh/year) | Total Energy Cost Savings (\$/year) | Net Measure Cost (\$) | SIR | Simple Payback (years) |
| Nominal | 2,102 | \$357 | \$25 | 77.41 | 0.07 |

Observations

Since the FES domestic hot water system serves only the kitchen and does not employ a recirculation pump, a Raychem Heat Trace device was installed along a 40' length of hot water pipe to keep it hot and provide for nearly instant hot water at the tap in the kitchen at all times. This device was installed without any controls and operates 24 hours per day year round when in fact there is demand for hot water only a few hours per day and only on days when school is in session.

Recommendations

OE recommends disconnection of power to the DHW heat trace device. The distance from the hot water heater to the kitchen is not that great and the pipes are well insulated so once they are heated up from the first use during normal hours of operation there will not be a tremendous amount of water wasted waiting for hot water at the tap.

Energy Savings and Assumptions

Energy savings are based on elimination of a 240 watt load that currently operates 8760 hours per year.

LCM-5: FES - Install DHW Timer

| Estimated Annual Savings | | | Estimated Capital Costs/Payback | | |
|--------------------------------------|--------------------------------|-------------------------------------|---------------------------------|------|------------------------|
| Electrical Energy Savings (kWh/year) | Propane Savings (gallons/year) | Total Energy Cost Savings (\$/year) | Net Measure Cost (\$) | SIR | Simple Payback (years) |
| 657 | n/a | \$112 | \$312 | 6.86 | 2.8 |

Observations

Since the FES domestic hot water system serves only the kitchen, there is only demand for hot water during a few hours per day on days when school is in session. Currently the DHW system operates 24 hours per day year round. Consequently a considerable quantity of energy is expended maintaining 120 gallons of hot water at all times even when it is not needed. The existing electric DHW tank heater is well insulated and has a reasonably fast recovery rate such that it should require no more than one hour of operation in the morning before it is needed in order to meet the demand.

Recommendations

OE recommends installing a programmable timer on the hot water heater so that it only operates during periods when hot water is necessary for operation of the school kitchen from 7am through 2pm weekdays. The timer should be disabled during summers and long holiday breaks. In the event disconnection of the heat tracer proves to be unsatisfactory, it can be wired to operate on the same schedule as the water heater so that most of the savings from that measure are still realized.

Energy Savings and Assumptions

Energy savings were calculated based on elimination of standby losses for 75% of the hours per year.

4.3 Ferndale Elementary School (FES) – Capital Intensive Measures (CIM)

Capital intensive measures are energy conservation and/or energy efficiency projects that require over \$1,000 dollars capital investment and/or internal time and effort required by on-site maintenance personnel.

CIM-1: FES – Install Centrally Controlled WIFI Enabled Thermostats with Passive Infrared (PIR) Occupancy Detection and Demand Control Ventilation System

| Estimated Annual Savings | | | Estimated Capital Costs/Payback | | |
|--------------------------------------|--------------------------------|-------------------------------------|---------------------------------|------|------------------------|
| Electrical Energy Savings (kWh/year) | Propane Savings (gallons/year) | Total Energy Cost Savings (\$/year) | Net Measure Cost (\$) | SIR | Simple Payback (years) |
| 232 | 2,148 | \$6,233 | \$96,930 | 0.87 | 15.55 |

Observations

Both the hot water ventilator heating systems in the Original Classroom Building and propane furnaces in the Annex are controlled by controlled by set-back thermostats. During the site assessment, OE noted that these thermostats were not accurately programmed or maintained and most were in “override” mode. Maintenance staff is responsible for manually reprogramming thermostats for holiday and summer breaks. According to staff, reprogramming does not always reflect actual occupancy levels. OE engineers observed the majority of thermostats had many errors in their programming including time settings, thermostat schedules, and temperature set points. Most thermostats were overridden to operate manually rather than in auto mode so that none of the savings normally associated with programmable thermostats are available. Consequently it is assumed that many classrooms are actually being heated in the middle of the night, over weekends and holidays, and other times when no occupants are present.

Outside ventilation air (OSA) is provided to the classrooms in the Main Building via through-wall dampered intakes located inside the fan coil ventilators. Only three of the classrooms and part of the west corridor in the Annex receive any outside air through the mechanical systems. Similarly the furnace serving the Multipurpose Room has no provision for outside air. The three furnaces serving the Elementary Gymnasium share a return air plenum with provisions for outside air but the OSA damper for this system is stuck in the open position. This condition allows a significant amount of outside air to enter the system which requires the furnaces to run more than necessary to reach desired set point temperatures.

Recommendations

In order to provide improved, centralized HVAC controls and provide optimal air quality, OE recommends considering installation of the following equipment in all areas of the annex.

- WIFI enabled thermostats equipped with PIR occupancy detection that sets back temperature settings when the spaces are unoccupied. This equipment will also provide centralized control

of the classroom HVAC systems which will facilitate more efficient modification of occupancy settings during breaks.

- Java Application Control Engine (JACE) thermostat control interface
- Operable dampers and Belimo type actuators
- CO2, OSA and return air temperature sensors to allow for demand control ventilation
- Optional Equipment as necessary:
 - Gateway range extender for thermostat WIFI network
- Repair/replace OSA damper controls on Gymnasium HVAC system and install CO2, OSA, and return air temperature sensors and continue to use rheostatic timer control.

Energy Savings and Assumptions

Energy savings were estimated using an Energy Pro, building performance model.

CIM-2: FES – Install Lighting Occupancy Sensors

| Estimated Annual Savings | | | Estimated Capital Costs/Payback | | |
|--------------------------------------|--------------------------------|-------------------------------------|---------------------------------|------|------------------------|
| Electrical Energy Savings (kWh/year) | Propane Savings (gallons/year) | Total Energy Cost Savings (\$/year) | Net Measure Cost (\$) | SIR | Simple Payback (years) |
| 4,703 | -33 | \$652 | \$1,984 | 2.70 | 3.04 |

Observations

While the Annex is equipped with lighting occupancy sensors in most spaces, none were observed in the Original Classroom Building during the field assessment. In most cases, lighting is controlled two-circuit manual switches.

Recommendations

OE recommends considering installing approximately 15 lighting occupancy sensor switches to control lighting when the room is unoccupied.

Energy Savings and Assumptions

Energy savings were estimated using the California Energy Commission's Energy Savings Calculator.

CIM-3: FES - Install Operable Ventilation Louvers in Gymnasium

| Estimated Annual Savings | | | Estimated Capital Costs/Payback | | |
|--------------------------------------|--------------------------------|-------------------------------------|---------------------------------|------|------------------------|
| Electrical Energy Savings (kWh/year) | Propane Savings (gallons/year) | Total Energy Cost Savings (\$/year) | Net Measure Cost (\$) | SIR | Simple Payback (years) |
| 17 | 36 | \$109 | \$1,851 | 0.74 | 14.11 |

Observations

The gymnasium currently has two large ventilation dampers mounted high on the exterior east and west walls nearest the north entrance. These louvers were formerly operable but at some point the mechanisms failed so they were blocked in the fully open position in order to provide adequate ventilation during games when the gymnasium is occupied. This results in approximately 250 cfm of continuous air leakage. This air leakage puts extra demand on the Gymnasium furnaces during warm up and maintenance of set point temperatures.

Recommendations

OE recommends replacing the old non-functional louvers with new operable dampers that can be sealed under normal circumstances when high rates of ventilation are not necessary.

Energy Savings and Assumptions

Energy savings were estimated using an Energy Pro, building performance model. This model is based on very conservative assumptions and regardless of the magnitude of energy savings actually realized it is likely that adequate comfort levels in the gym will be far more accessible and maintainable under a wider range of conditions.

CIM-4: FES - Insulate Roof over Gymnasium

| Estimated Annual Savings | | | Estimated Capital Costs/Payback | | |
|--------------------------------------|--------------------------------|-------------------------------------|---------------------------------|------|------------------------|
| Electrical Energy Savings (kWh/year) | Propane Savings (gallons/year) | Total Energy Cost Savings (\$/year) | Net Measure Cost (\$) | SIR | Simple Payback (years) |
| -237 | 44 | \$187 | \$9,418 | 0.67 | 50.4 |

Observations

The gymnasium currently has little or no insulation. There may be nominal insulation integrated into the prefabricated walls but none was observed in either the roof or floor.

Recommendations

OE recommends getting bids for rigid insulation and spray foam when it comes time to re-roof the gymnasium. The models for this structure are particularly sensitive to various factors including hours of operation, occupant density, ventilation rates, and HVAC system type. In the current configuration adding insulation does not appear particularly cost effective, but as part of a more comprehensive modernization or if the building is expected to be heated and utilized more frequently than it is currently, these economics can change dramatically.

Energy Savings and Assumptions

Energy savings were estimated using an Energy Pro, building performance model. This model is based on very conservative assumptions that reflect limited actual heating system operating hours based on manual operation of the existing timer switch. If other recommended upgrades including demand control ventilation and central HVAC controls are installed and it eventually becomes desirable to keep the gym heated above 55°F, the economics of insulating the roof would likely be more favorable.

CIM-5 FES - Replace Existing Propane Furnaces Over 10 Years Old with High Efficiency Equivalent

| Estimated Annual Savings | | | Estimated Capital Costs/Payback | | |
|--------------------------------------|--------------------------------|-------------------------------------|---------------------------------|------|------------------------|
| Electrical Energy Savings (kWh/year) | Propane Savings (gallons/year) | Total Energy Cost Savings (\$/year) | Net Measure Cost (\$) | SIR | Simple Payback (years) |
| Nominal | 647 | \$2,266 | \$67,275 | 0.72 | 29.7 |

Observations

The twelve furnaces serving the Annex are standard 80% combustion efficiency units that exceed 10 years of age. All of these systems are substantially oversized for the zones that they serve, resulting in frequent cycling of short run times that contributes to operational inefficiencies and accelerated wear and tear on system components.

Recommendations

OE recommends considering replacing these aging propane furnaces with high efficiency condensing furnaces accurately sized for the zones they are serving. The furnaces serving the Gym and Multipurpose room are more appropriately sized and though they are also aging, run much less frequently. Therefore replacement of the Gymnasium and Multipurpose room HVAC systems is not recommended at this time based solely on potential energy savings.

Energy Savings and Assumptions

Energy savings were presented for this measure were calculated using the California Energy Commission's Energy Savings Calculator for Proposition 39 Projects. Energy savings calculated in the EnergyPro building performance model created for this facility are a more modest 2%, or 101 gallons of propane per year.

CIM-6: FHS – Replace Existing Propane Furnaces with High Efficiency Ductless Heat Pumps

| Estimated Annual Savings | | | Estimated Capital Costs/Payback | | |
|--------------------------------------|--------------------------------|-------------------------------------|---------------------------------|------|------------------------|
| Electrical Energy Savings (kWh/year) | Propane Savings (gallons/year) | Total Energy Cost Savings (\$/year) | Net Measure Cost (\$) | SIR | Simple Payback (years) |
| -77 | 2605 | \$6,480 | \$97,175 | 1.19 | 15.0 |

Observations

The twelve furnaces serving the Annex are standard 80% combustion efficiency units that exceed 10 years of age. All of these systems are substantially oversized for the zones that they serve, resulting in frequent cycling of short run times that contributes to operational inefficiencies and accelerated wear and tear on system components. Additionally propane is very expensive heating fuel when compared to alternative sources.

Recommendations

OE recommends considering replacing the propane furnaces in the Annex with either individual or multi-head variable refrigerant flow (VRF) high efficiency, ductless heat pumps accurately sized for the zones they are serving. Ventilation air will be provided by a separate, ducted heat-recovery ventilation system or be integral to the ductless heating system.

Energy Savings and Assumptions

Energy savings were estimated using an Energy Pro building performance model.

4.4 Ferndale Elementary School (FES) – Health & Safety Measures (H&S) and Operation & Maintenance Measures (OMM)

The following section details health & safety and operation & maintenance issues noted during the field assessments at Ferndale High School.

H&S-1: FES - Seal Ducts in Annex Attic

Observations

OE engineers observed significant air leakage at the connection between return ducts and furnace return air plenums on most of the existing Annex furnaces. This condition allows attic air, full of undesirable contaminants such as airborne fiberglass, to be drawn into the supply air stream and delivered by the registers directly into the classrooms. During early morning hours when the attic air temperature may be very cold, this also increases the net energy cost of heating supply air by the furnace systems.

Recommendations

OE recommends sealing all ducts and duct connections. In addition to air quality benefits of sealing return air ducts, any leaks identified and repaired in supply air ducts may yield significant energy savings.

H&S-2: FES – Fire Doors in Original Classroom Building Wired Open

Observations

The fire doors in the attic above the original classroom building had been wired to remain in an open position. This condition renders the fire walls ineffective at containing fire within the attic space.

Recommendations

Remove wires from fire doors and leave doors in “normally closed” position.

OMM-1: FES - Increase Annex Attic Ventilation and Air Seal

Observations

OE engineers were informed by staff of consistent complaints of overheating in south facing classrooms in the Annex. OE engineers observed that the central attic area above those classrooms is very poorly ventilated, and that there are multiple pathways for air to move between the attic and occupied spaces below around various ceiling penetrations. The original design of this area attempted to provide attic ventilation in this area by soffit vents, however an architectural feature that protrudes from the south face of the building at Classroom 5 included framing that effectively closed off that soffit venting significantly restricting air flow in this area. Even on a mild day it was noted that the particular attic area, sealed off from other attic areas by firewalls, was approximately 20°F warmer than the rest of the attic. It is likely that on very warm days the temperature difference could easily climb to 3 or 4 times that large.

Recommendations

OE recommends providing more ventilation to attic area above Classroom 5, either by way of opening up air path for the existing soffit vents or by installing new eyebrow vents in the roof as low as possible down toward the eaves so that air can flow from the eaves up to the ridge vents as designed. In addition OE recommends use of spray foam to improve the air seal between the attic and the occupied spaces below, particularly around light fixtures and ceiling HVAC registers as well as along the top plates of all walls. Installers performing this task must take care to carefully replace any fiberglass installation that may be disturbed in the process.

OMM-2: FES - Improve Heat Distribution in the Original Classroom Building

Observations

OE engineers were informed of many complaints from staff of poor heat distribution in Original Classroom Building classroom areas heated by hot water fan coil ventilators. These spaces tend to be very warm near the units but colder on opposite sides of the rooms, particularly near the doors. There is also significant stratification with much warmer temperatures near the ceilings and colder temperatures near the floors.

Recommendations

OE recommends re-circulating fans to help distribute warm air more evenly throughout classrooms. Conventional ceiling fans may be undesirable in the classroom environment not only for safety reasons but because the sensation of moving air makes human bodies feel cooler than still air. An alternative design that can be quite cost effective uses some form of small duct pipe with a low power inline fan. The system is installed into the space so that it pulls warm air from the ceiling and delivers it directly down to floor level. Such systems are available from a local vendor for less than \$100 each, or could even be constructed as student projects using cheap materials such as PVC pipe and 12V computer fans mounted in blue plastic electrical boxes. Such a project could provide a cost effective means of improving building performance and occupant comfort while providing valuable learning opportunities in topics including physical science, mathematics, economics, and artistic design.

OMM-3: FES – Repair/Replace weatherstripping on exterior doors

Observations

Weatherstripping on exterior doors in the Original School Building was missing or damaged.

Recommendations

OE recommends evaluating all exterior door weatherstripping and repair/replace as necessary.

OMM-4: FES – Enable Power Saving Protocols on all Computers

Observations

OE noted that computers in the lab were in “full on” mode when the lab was not occupied. This continuous “phantom load” contributes to a relatively high base load in the subject facility.

Recommendations

OE recommends enabling power saving protocols on all computers on campus. These protocols power down the computer to minimum levels dramatically reducing standby losses.

4.5 Ferndale Elementary School - Measures Considered But Not Analyzed (CBNA)

The following measures were considered based on possible energy savings, but preliminary analyses indicate due to unknown information, cost, technical complexity or scope are not currently recommended as energy savings measures.

CBNA-1: FES - Add to Existing Insulation in Main Building

The main building has old fiberglass insulation throughout most of the attic. This insulation had a nominal value of R-19 as installed but has been disturbed in many areas and along with general degradation should be de-rated to a value of about R-13. Current building codes require a minimum of R-30 attic insulation for new construction. OE engineers considered adding new insulation to bring the current levels up to code, however this measure was deemed infeasible due to the presence of plywood decking and other obstacles throughout a large percentage of the total accessible attic area.

CBNA-2: FES - Insulate Elementary Gymnasium Floor

The FES Gymnasium floor currently has no insulation. Current building codes require a minimum of R-19 insulation for floors over crawlspace in new construction. OE engineers considered retrofitting spray foam insulation to the existing floor to bring it up to code, however this measure was deemed infeasible due to very poor access to the gym crawlspace, which would not allow for an installer to safely cover enough of the floor area to have any meaningful impact on building energy performance.

CBNA-3: FES - Heat Recovery Ventilators

Most of the classrooms and other work areas in the FES Annex currently have no provision for outside air in their existing mechanical systems. Current codes require mechanical ventilation as part of any new mechanical system whether new construction or mechanical alteration. Ventilation rates for classroom occupancy generally require between 20 to 50% of supply air from outside, with the remainder of the preheated return air from the space being exhausted from the building at considerable expense. Heat recovery ventilators (HRVs) use a heat exchanger to recapture much of the energy embedded in that exhaust air and return it back to the space either directly or by cycling it back through the HVAC system. HRVs tend to be cost effective in very hot and very cold climates where the temperature difference between inside and outside is great for a high percentage of the year. HRVs are also more cost effective in buildings that are operated a high number of hours per year. The literature concludes that for schools in temperate climates where neither the temperature differences nor the hours of operation meet those criteria, the savings from HRVs tend to not be great enough to outweigh the cost of the measure.

4.6 Ferndale High School (FHS) - Low-Cost/No-Cost Measures (LCM)

No-cost/low-cost measures are energy conservation, energy efficiency, or time-of-use management projects that require up to \$1,000 dollars capital investment and/or internal time and effort required by on-site maintenance personnel.

LCM-1: FHS - Repair Pressure Relief Valve (PRV) on Gymnasium Boiler

| Estimated Annual Savings | | | Estimated Capital Costs/Payback | | |
|--------------------------------------|--------------------------------|-------------------------------------|---------------------------------|-------|------------------------|
| Electrical Energy Savings (kWh/year) | Propane Savings (gallons/year) | Total Energy Cost Savings (\$/year) | Net Measure Cost (\$) | SIR | Simple Payback (years) |
| Nominal | 552 | \$1,570.01 | \$365.70 | 18.28 | 0.23 |

Observations

Upon first inspection of Gymnasium boiler room (12/2014), engineers noted that a significant flow of ~180°F water leaking from the PRV line to a floor drain. The leak was only observed when the boiler was firing and OE estimates the flow of this leak in excess of one gallon per minute at all times when the boiler is firing. It is unknown how long this leak was occurring, but evaluation of water billing data indicated that a water use “spike” occurred in the month of November, 2014 which may be related to this issue.

Recommendations

OE recommends replacing the faulty PRV valve.

Energy Savings and Assumptions

Energy and water savings were estimated using the Water Leak Cost Calculator by the Food Service Technology Center in partnership with PG&E at www.fishnick.com/savewater/tools/leakcalculator. This calculator also includes the cost of water delivery as part of the annual cost savings.

LCM-2: FHS - Install Gymnasium Boiler Timer

| Estimated Annual Savings | | | Estimated Capital Costs/Payback | | |
|--------------------------------------|--------------------------------|-------------------------------------|---------------------------------|-------|------------------------|
| Electrical Energy Savings (kWh/year) | Propane Savings (gallons/year) | Total Energy Cost Savings (\$/year) | Net Measure Cost (\$) | SIR | Simple Payback (years) |
| Nominal | 1,352 | \$3,448.25 | \$388.13 | 125.3 | 0.11 |

Observations

The gymnasium boiler is currently serving the building heating and domestic water heating (DHW) demands. The domestic water heating system is a 400-gallon storage tank that contains a heat exchanger which is heated by boiler water. Though the space heating system is controlled by rheostatic controls which limit boiler demands to short periods, the domestic water heating system exerts an intermittent energy demand via tank standby losses on the boiler 24-hours per day. This 24-hour, intermittent DHW demand cycle is clear in the data obtained by logging boiler run time.

Recommendations

OE recommends installing a timer on the boiler electrical controls that will disable the boiler during unoccupied periods.

Energy Savings and Assumptions

Energy savings were calculated based on unoccupied period (6 pm to 6 am) run times observed in data logged from boiler fan run times and the boiler rated capacity. Boiler run time data was normalized to provide “average” daily unoccupied period run times throughout the year.

LCM-3: FHS – Install New Aquastats and Lower Gymnasium Boiler Water Temperature

| Estimated Annual Savings | | | Estimated Capital Costs/Payback | | |
|--------------------------------------|--------------------------------|-------------------------------------|---------------------------------|------|------------------------|
| Electrical Energy Savings (kWh/year) | Propane Savings (gallons/year) | Total Energy Cost Savings (\$/year) | Net Measure Cost (\$) | SIR | Simple Payback (years) |
| Nominal | 190 | \$484.37 | \$533.60 | 4.55 | 1.10 |

Observations

Gymnasium boiler water temperature set points are between 180°F and 200°F. These temperatures are unnecessarily high for the current building heating and domestic water heating demands. Thermometers mounted on the boiler supply and return lines indicate that actual water temperatures may be higher than set points and it is unknown when the last calibration of the Honeywell aquastats temperature sensors was performed.

Recommendations

OE recommends performing temperature sensor calibration and lower boiler set points to maintain temperature between 160°F and 180°F. Boiler water temperature should be lowered in stages to ensure that temperatures do not reach below 160°F. Low temperature boiler water return can cause condensation within the burner which may damage boiler components.

Energy Savings and Assumptions

Energy savings are based on conservative literature estimates of 5% reduction in energy use per 10 degree decrease in set point temperature.

LCM-4: FHS – Install Lighting Controls on Metal Halide Lights in Basketball Court

| Estimated Annual Savings | | | Estimated Capital Costs/Payback | | |
|--------------------------------------|--------------------------------|-------------------------------------|---------------------------------|-------|------------------------|
| Electrical Energy Savings (kWh/year) | Propane Savings (gallons/year) | Total Energy Cost Savings (\$/year) | Net Measure Cost (\$) | SIR | Simple Payback (years) |
| 8,100 | n/a | \$1,377.00 | \$270.25 | 39.67 | 0.20 |

Observations

Much of the lighting in the basketball court has been retrofitted to high-bay T-8 lamps and fixtures. However, five, 1000-watt metal halide lamps remain. According to maintenance staff, all of the lights in the basketball court are manually operated and run for an average of 9 hours per day.

Recommendations

OE recommends installing lockable lighting controls that limit access to the gymnasium lighting, and limiting metal-halide run times to “as necessary” (i.e. during games).

Energy Savings and Assumptions

Energy savings are based on the number and rated power of the metal halide lighting, and an assumed operation 9 hours per day over the 180 day school year.

4.7 Ferndale High School (FHS) – Capital Intensive Measures (CIM)

Capital intensive measures are energy conservation and/or energy efficiency projects that require over \$1,000 dollars capital investment and/or internal time and effort required by on-site maintenance personnel.

CIM-1: FHS - Isolate Gymnasium Roof Top Air Handler Coils

| Estimated Annual Savings | | | Estimated Capital Costs/Payback | | |
|--------------------------------------|--------------------------------|-------------------------------------|---------------------------------|------|------------------------|
| Electrical Energy Savings (kWh/year) | Propane Savings (gallons/year) | Total Energy Cost Savings (\$/year) | Net Measure Cost (\$) | SIR | Simple Payback (years) |
| Nominal | 704 | \$1,795.24 | \$3,299.35 | 2.77 | 1.84 |

Observations

The gymnasium roof-top air handler and fan coil unit are in extreme disrepair and are not used. However, thermal imaging of this unit indicates that the when the main pump for the Gym heating system is activated, hot water flows through this unit's heat coil. This is a significant source of heat loss through the roof-top system. Also as evidenced by thermal imaging, even when the boiler pump is not running, significant pipe heat loss occurs at this unit via thermosiphoning. Thermosiphoning is the passive circulation of water through a network via convection.

Recommendations

OE recommends isolating the gym roof-top air handler by installing new 3/4" isolation gate valves adjacent to the unit on the roof top that prevent boiler water from circulating through the unit. The entire boiler water distribution may need to be drained for this process.

Energy Savings and Assumptions

Energy savings were estimated by allocating a portion of the "excess run times" observed during unoccupied periods, when heating systems were in inactive, as recorded by data loggers installed on the boiler. Excess run times relating to heat loss from the roof top air handler coils were conservatively assumed to be 15% of total "excess run time".

CIM-2: FHS - Replace Gymnasium Heating and Domestic Water Heating Systems

| Estimated Annual Savings | | | Estimated Capital Costs/Payback | | |
|--------------------------------------|--------------------------------|-------------------------------------|---------------------------------|------|------------------------|
| Electrical Energy Savings (kWh/year) | Propane Savings (gallons/year) | Total Energy Cost Savings (\$/year) | Net Measure Cost (\$) | SIR | Simple Payback (years) |
| 3,948 | 2,276 | \$6,707.00 | \$37,185.25 | 3.62 | 5.54 |

Observations

A central boiler plant was originally designed and constructed to provide all heat for domestic water and conditioned zones within the Gymnasium. Hot water from the boiler is pumped to two fan coils (air handlers) associated with the zones served. As discussed under CIM-2, the air handler on the roof is inoperable, yet hot water is still circulated to its coils when the gymnasium heating system is activated. According to staff, the remaining air handler that serves the boys' and girls' locker rooms is used to heat the gym and is operated approximately 2 hours per day during the heating season.

Domestic hot water in the gymnasium is provided from a hot water loop that is pumped from the boiler through a heat exchanger in a 400-gallon storage tank. This system was originally sized to meet hot water demand from showers in the girl's and boy's locker rooms. According to staff, the locker room showers are rarely used by students during the school day and the remaining hot water demand in the gymnasium is limited to occasional use after sporting events.

Recommendations

Due to the low hours of operation of the gymnasium heating system and the limited to no use of the domestic water heating systems the boiler system the system appears to be oversized for current usage patterns. OE recommends considering replacing the existing systems with the following equipment and controls:

- Basketball Court – Two, 250,000 BTUH propane unit heaters with 1-hour rheostatic timer control.
- Boys' and Girls' Locker Rooms –45,000 BTUH propane unit heater with 1-hour rheostatic timer control (One per locker room).
- Domestic Hot Water (DHW) – Two, 199,000 BTUH propane on-demand, condensing water heaters staged in parallel. Parallel DHW system installed in gymnasium boiler room.
- Extend existing propane distribution lines in gymnasium boiler room to unit heater and DHW locations.

Energy Savings and Assumptions

Energy savings were estimated using an Energy Pro, building performance model.

CIM-3: FHS – Install Centrally Controlled WIFI Enabled Thermostats with Passive Infrared (PIR) Occupancy Detection and Demand Control Ventilation System

| Estimated Annual Savings | | | Estimated Capital Costs/Payback | | |
|--------------------------------------|--------------------------------|-------------------------------------|---------------------------------|------|------------------------|
| Electrical Energy Savings (kWh/year) | Propane Savings (gallons/year) | Total Energy Cost Savings (\$/year) | Net Measure Cost (\$) | SIR | Simple Payback (years) |
| 281 | 1,274 | \$3,305.00 | \$39,847.50 | 1.06 | 12.06 |

Observations

The heating systems in the Main Classroom Building consist of individual condensing furnaces in each classroom controlled by set-back thermostats. During the site assessment, OE noted that these thermostats were not accurately programmed or maintained and most were in “override” mode. Maintenance staff is responsible for manually reprogramming thermostats for holiday and summer breaks. According to staff, reprogramming does not always reflect actual occupancy levels.

Outside ventilation air (OSA) is provided to the classrooms via dampered intakes located in the return plenum. Field assessment indicated that originally, these dampers were operable and equipped with controls and actuators to allow for OSA flow modulation. None of the dampers or control systems assessed during the field work were operable and were fully open allowing over 40% OSA intake at all times.

Recommendations

In order to provide improved, centralized HVAC controls, OE recommends considering installation of the following equipment.

- WIFI enabled thermostats equipped with PIR occupancy detection that sets back temperature settings when the classrooms are unoccupied. This equipment will also provide centralized control of the classroom HVAC systems which will facilitate more efficient modification of occupancy settings during breaks.
- Java Application Control Engine (JACE) thermostat control interface
- Operable dampers and Belimo type actuators
- CO₂, OSA and return air temperature sensors to allow for demand control ventilation
- Optional Equipment as necessary:
 - Gateway range extender for thermostat WIFI network

Energy Savings and Assumptions

Energy savings were estimated using an Energy Pro, building performance model.

CIM-4: FHS – Insulate Attic in Main Classroom Building and Administrative Offices

| Estimated Annual Savings | | | Estimated Capital Costs/Payback | | |
|--------------------------------------|--------------------------------|-------------------------------------|---------------------------------|------|------------------------|
| Electrical Energy Savings (kWh/year) | Propane Savings (gallons/year) | Total Energy Cost Savings (\$/year) | Net Measure Cost (\$) | SIR | Simple Payback (years) |
| 253 | 622 | \$1,652.00 | \$15,872.50 | 2.22 | 9.61 |

Observations

The attic space is insulated with redwood bark to a depth of approximately 3". This material is likely original to the construction of the facility and is significantly degraded (dried and compacted). The R-value of this material in its current condition is very low ~R-3. Access to the attic is limited to three attic hatches, one located in the library, one located in a storage room in Room 1, and one in the Spanish room. The limited number of hatches makes it very difficult to access attic space in all wings of the school.

Recommendations

OE recommends considering adding attic insulation to achieve an R-value of R-38. The following products should be considered:

- Loose-fill blown-in cellulose to a depth of approximately 12"
- Loose-fill, blown-in fiberglass to a depth of approximately 16"

Additionally, OE recommends installing attic hatches in at least one location in each wing of the school.

Energy Savings and Assumptions

Energy savings were estimated using an Energy Pro building performance model.

CIM-5: FHS – Replace Existing Single-Paned Windows with Double-Paned Equivalent

| Estimated Annual Savings | | | Estimated Capital Costs/Payback | | |
|--------------------------------------|--------------------------------|-------------------------------------|---------------------------------|------|------------------------|
| Electrical Energy Savings (kWh/year) | Propane Savings (gallons/year) | Total Energy Cost Savings (\$/year) | Net Measure Cost (\$) | SIR | Simple Payback (years) |
| -653 | 508 | \$1,220.00 | \$100,625.00 | 0.53 | 71.72 |

Observations

Most of the glazing noted during the field assessment consists of wood-framed, singled-paned windows. The western exposed windows in the main office and superintendent's office (southwest corner of facility) have aluminum frames, but still have only single panes of glass.

Due to the orientation of the facility combined with high ceilings (12'), there is a significant amount of north facing, single-paned windows, which leads to a large amount of heat loss due to conduction and air-leakage.

Recommendations

OE recommends considering replacing existing single-paned windows with double paned, vinyl- or fiberglass- framed equivalent. The windows should meet the following minimum specifications:

- U-Factor ≤ 0.30
- SHGC ≤ 0.40

New windows will provide a modest improvement in R-Value, but will also likely provide a significant decrease in air leakage, and provide acoustic improvements.

Energy Savings and Assumptions

Energy savings were estimated using an Energy Pro, building performance model. The increase in electrical energy consumption is due to an increased demand for mechanical ventilation with the reduction in passive air leakage from the windows.

CIM-6: FHS – Replace Existing Propane Furnaces Over 10 Years Old with High Efficiency Equivalent

| Estimated Annual Savings | | | Estimated Capital Costs/Payback | | |
|--------------------------------------|--------------------------------|-------------------------------------|---------------------------------|------|------------------------|
| Electrical Energy Savings (kWh/year) | Propane Savings (gallons/year) | Total Energy Cost Savings (\$/year) | Net Measure Cost (\$) | SIR | Simple Payback (years) |
| Nominal | 271 | \$689.78 | \$25,875.00 | 0.23 | 37.51 |

Observations

Five of thirteen propane furnaces in the Classrooms and Administrative Offices exceed 10 years of age. The remaining eight propane furnaces in this building have been replaced within the past five years with high efficiency (94%+) condensing furnaces.

Recommendations

OE recommends considering replacing the remaining, aging, propane furnaces with high efficiency condensing furnaces accurately sized for the zones they are serving.

Energy Savings and Assumptions

Energy savings were estimated using the California Energy Commission's Energy Savings Calculator for Proposition 39 projects.

CIM-7: FHS – Replace Existing Propane Furnaces with High Efficiency, Multi-Head (VRF) Ductless Heat Pumps

| Estimated Annual Savings | | | Estimated Capital Costs/Payback | | |
|--------------------------------------|--------------------------------|-------------------------------------|---------------------------------|------|------------------------|
| Electrical Energy Savings (kWh/year) | Propane Savings (gallons/year) | Total Energy Cost Savings (\$/year) | Net Measure Cost (\$) | SIR | Simple Payback (years) |
| -42,462 | 6,562 | \$8,862.00 | \$97,175.00 | 1.53 | 10.97 |

Observations

The Classrooms and Administrative Offices are currently heated with propane-fired, condensing furnaces of varying ages. These units are generally oversized for the zones that they are serving. Additionally propane is very expensive heating fuel when compared to alternative sources.

Recommendations

OE recommends considering replacing the propane furnaces in the Classrooms and Administrative Offices with high efficiency, VRF ductless heat pump(s) accurately sized for the zones they are serving. Ventilation air will be provided by a separate, ducted ventilation system or be integral to the ductless heating system.

Energy Savings and Assumptions

Energy savings were estimated using an Energy Pro building performance model.

CIM-8: FHS – Install Lighting Occupancy Sensors

| Estimated Annual Savings | | | Estimated Capital Costs/Payback | | |
|--------------------------------------|--------------------------------|-------------------------------------|---------------------------------|------|------------------------|
| Electrical Energy Savings (kWh/year) | Propane Savings (gallons/year) | Total Energy Cost Savings (\$/year) | Net Measure Cost (\$) | SIR | Simple Payback (years) |
| 10,974 | -78 | \$1,522.30 | \$4,628.75 | 2.45 | 2.70 |

Observations

No lighting occupancy sensors were observed in the field assessment. In most cases, lighting is controlled two-circuit manual switches.

Recommendations

OE recommends considering installing approximately 35 lighting occupancy sensor switches to control lighting when the room is unoccupied.

Energy Savings and Assumptions

Energy savings were estimated using the California Energy Commission's Energy Savings Calculator.

4.8 Ferndale High School (FHS) – Health & Safety Measures (H&S) and Operation & Maintenance Measures (OMM)

The following section details health & safety and operation & maintenance issues noted during the field assessments at Ferndale High School.

H&S-1: FHS – Propane gas leaks noted at furnaces**Observations**

During evaluation of the furnaces in the classrooms and administrative offices the following leaks were identified:

- Superintendent's Office – Leak noted at connection from main gas line to flexible appliance line.
- Room 11 – Leak noted at regulator connection.

Recommendations

These leaks should be evaluated and repaired as necessary by qualified personnel.

H&S-2: FHS – Fire Doors in Original Classroom Building Wired Open**Observations**

The fire doors in the attic above the original classroom building had been wired to remain in an open position. This condition renders the fire walls ineffective at containing fire within the attic space.

Recommendations

Remove wires from fire doors and leave doors in "normally closed" position.

OMM-1: FHS - Purge Shop Class Air Compressor of Accumulated Moisture

Observations

OE engineers observed a significant amount of water while purging the Shop Class air compressor. This moisture is a common occurrence in such equipment and is due to condensation. However, leaving the water in the tank can cause premature failure of air tools reliant on the compressor as well as having deleterious effects on the compressor itself.

Recommendations

Compressor tank should be purged monthly in order to discharge accumulated water.

OMM-2: FHS - Clear Gymnasium Roof of Vegetation and Debris Bi-Annually

Observations

OE engineers observed vegetation and debris collecting near scuppers and in low areas on the roof on the High School Gymnasium. This condition can lead to inadequate roof drainage and premature degradation of roofing materials.

Recommendations

Roof should be inspected and excess debris and vegetation should be cleared bi-annually.

OMM-3: FHS – Repair/Replace weatherstripping on exterior doors

Observations

Weatherstripping on exterior doors in the Original School Building was missing or damaged.

Recommendations

OE recommends evaluating all exterior door weatherstripping and repair/replace as necessary.

OMM-4: FHS – Enable Power Saving Protocols on all Computers

Observations

OE noted that computers in the lab were in “full on” mode when the lab was not occupied. This continuous “phantom load” contributes to a relatively high base load in the subject facility.

Recommendations

OE recommends enabling power saving protocols on all computers on campus. These protocols power down the computer to minimum levels dramatically reducing standby losses

4.9 Ferndale High School - Measures Considered But Not Analyzed

The following measures were considered based on possible energy savings, but preliminary analyses indicate due to unknown information, cost, technical complexity or scope are not currently recommended as energy savings measures.

CBNA-1: FHS - Lower Ceilings in Classrooms

Observations

Due to the orientation of the facility combined with high ceilings (12'), there is a significant amount of north facing, single-paned windows, which leads to a large amount of heat loss due to conduction and air-leakage.

Discussion

This measure consists of completing significant renovation to the classroom spaces to lower ceilings by installing insulated (R-38), suspended ceilings, and simultaneously replacing approximately 35% of the north facing glazing with insulated (R-19) walls. This measure would require significant construction effort and electrical modifications to install new lighting in the suspended ceiling.

This measure was not analyzed beyond preliminary cost/energy savings estimates, which indicated that this was not an economically viable solution based on energy savings alone. Other benefits from such a measure such as improved acoustics, aesthetics, and general comfort levels might support such a measure as part of a larger modernization project where energy savings are only one component driving the decision.

ALTERATION AND RECONSTRUCTION PROJECTS – DSA APPROVAL EXEMPTION

| | | | | | |
|---------------------|--------------------|-----------------|------------------|------------------|------------------|
| Disciplines: | Structural | History: | Revised 06-30-16 | Revised 05-15-13 | Revised 07-02-09 |
| | Fire & Life Safety | | Revised 02-12-16 | Revised 02-22-13 | Revised 12-08-08 |
| | Access Compliance | | Revised 02-04-15 | Revised 01-24-12 | Revised 03-17-08 |
| | | | Revised 04-30-14 | Revised 03-10-11 | Revised 05-29-07 |
| | | | | Revised 11-03-10 | Issued 11-16-05 |

PURPOSE: The purpose of this Interpretation of Regulations (IR) is to clarify when plans and specifications for alteration or reconstruction projects governed by California Education Code Sections 17295 and 81133 are required to be submitted to the Division of the State Architect (DSA) for review and approval, and to make the annual adjustment to the construction cost thresholds cited in the California Education Code sections.

1. EXCEPTIONS:

- 1.1** DSA review and approval is not required for alteration or reconstruction projects to school buildings governed by the Field Act with an estimated construction cost of \$100,000, or less, for 2016 and 2017.
- 1.2** DSA review and approval is not required for alteration or reconstruction projects to school buildings governed by the Field Act with an estimated construction cost greater than \$100,000, but not in excess of \$225,000, for 2016 and 2017 when all of the following conditions are met:
 - 1.2.1** A California-registered structural engineer shall examine the project and prepare a written statement certifying that the project does not contain any work of a structural nature. The statement must attest that the work does not cause any alteration or reconstruction of structural elements nor trigger structural rehabilitation per Title 24, Part 1, Section 4-309(c). This statement shall bear the signature and stamp or seal of the structural engineer and shall be filed with the appropriate DSA regional office.
 - 1.2.2** The design professional in responsible charge of the project shall prepare a statement certifying that the plans and specifications (1) contain no work that is regulated by the accessibility standards of Title 24, (2) contain no work that triggers accessibility upgrades to existing buildings or facilities, and (3) meet all applicable fire and life safety standards. This statement shall bear the signature and stamp or seal of the design professional and shall be filed with the appropriate DSA regional office.
 - 1.2.3** Within 10 days of the project completion, a DSA-certified project inspector shall sign and submit a verified report to DSA indicating that the completed project is in conformance with the plans and specifications. Form [DSA 999: Inspection Verified Report for Projects Exempt from DSA Approval](#), is available from the DSA website at www.dgs.ca.gov/dsa/Forms.aspx.
- 2. VOLUNTARY SUBMITTAL:** This interpretation does not preclude a design professional or school district from choosing to submit plans and specifications with the appropriate fee to DSA for review, even when the project is exempted from DSA plan review requirements as outlined herein.
- 3. REQUIREMENT TO COMPLY:** Projects not requiring DSA approval (i.e., exempt projects) shall comply with all currently effective design, construction, and inspection provisions of the California Code of Regulations, Title 24, as adopted by DSA. **When authorizing construction of exempt projects described in this interpretation, the school district**

**ALTERATION AND RECONSTRUCTION PROJECTS – DSA APPROVAL
EXEMPTION**

assumes responsibility to ensure compliance with all code provisions.

4. DEFINITION: For this interpretation, “design professional in responsible charge” or “design professional” shall be the architect, structural engineer, or professional engineer (e.g., mechanical engineer for mechanical-only projects; electrical engineer for electrical-only projects), licensed to practice in California, who is responsible for the completion of the project design work.

5. ANNUAL ADJUSTMENT OF COST THRESHOLDS: Construction cost thresholds cited in this interpretation are based on June 2016 figures of \$100,000 and \$225,000, and are adjusted annually commencing January 1, 2018, per the California Education Code. Annual adjustments are calculated using the first January issue of *Engineering News-Record’s U.S. 20 City Construction Cost Index*.

6. PROJECT COST DETERMINATION: For purposes of this interpretation, the estimated construction cost shall be determined at the completion of project design. Effective July 1, 2013, for the purpose of determining estimated project cost, the scope of the project shall be limited to construction on one site only.

In accordance with Education Code Section 17280, the estimated construction cost used in determining exemption from DSA review shall not include the cost of air-conditioning equipment¹ and insulation materials², and installation cost of such equipment and materials when such installation does not cause structural alterations³ to a school building (i.e., effects primary or secondary framing members). In cases where such installation causes structural alterations to a school building, the provisions of Title 24, Part 1, Section 4-309 will apply and the project may require DSA review and approval.

¹ For purposes of this provision, air conditioning (AC) equipment includes heating, ventilation, and air conditioning (HVAC), AC units, heating units, or ventilation units, and does not include ductwork or utility services (i.e., electrical and/or gas service) to the equipment.

² For purposes of this provision, insulation materials must be of the same type as previously installed in accordance with building standards.

³ For purposes of this provision, the exclusion of HVAC-related cost is valid only when a determination of no structural alteration is made by a California-registered structural engineer in accordance with requirements of Section 1.2.1 of this IR.

7. SUBDIVISION OF PROJECTS PROHIBITED: Construction projects shall not be subdivided for the purpose of obtaining exemption from DSA review and approval.

REFERENCES:

California Code of Regulations (CCR) Title 24
Part 1, California Building Standards Administrative Code
Sections 4-306, 4-308, 4-309, 4-315, 4-336, and 5-102
California Education Code, Sections 17295 and 81133

This Interpretation of Regulations (IR) is intended for use by the Division of the State Architect (DSA) staff, and as a resource for design professionals, to promote more uniform statewide criteria for plan review and construction inspection of projects within the jurisdiction of DSA which includes State of California public elementary and secondary schools (grade K-12), community colleges and state-owned or state-leased essential services buildings. This IR indicates an acceptable method for achieving compliance with applicable codes and regulations, although other methods proposed by design professionals may be considered by DSA.

This IR is reviewed on a regular basis and is subject to revision at any time. Please check the DSA website for currently effective IRs. Only IRs listed at <http://www.dgs.ca.gov/dsa/Resources/IRManual.aspx> at the time of plan submittal to DSA are considered applicable.

PROCEDURE: EXEMPT CONCURRENCE

PURPOSE: To provide procedure for external stakeholders to obtain written concurrence that a qualifying project is exempt from DSA review and approval of plans.

BACKGROUND: DSA reviews and approves plans for construction projects under its jurisdiction for California Code of Regulations, Title 24 compliance. The scope of DSA's review depends on the type of facility and the scope of the project. The majority of DSA's plan review and approval focuses on new construction and alteration projects for California school and community college districts. Certain types of projects, depending on the scope, may be exempt from the requirement to obtain DSA's review and approval of plans.

1. EXEMPTION DEFINED: When a project is found to be exempt from DSA review and approval, it can be constructed without an approval from DSA. However, the project must be fully compliant with all applicable portions of the California Code of Regulations, Title 24. In authorizing and completing the design and construction of exempt projects, the school board assumes the responsibility for employing appropriately licensed architects or engineers to prepare the plans and specification, and assumes the responsibility for employing DSA certified inspectors to provide for the adequate inspection of materials and work of construction.

2. TYPES OF EXEMPTIONS: DSA reviews and approves plans for code compliance in three main areas, Structural Safety, Fire & Life Safety, and Accessibility. It is possible for a project to be exempt from DSA review and approval in any or all of these areas.

2.1 Exemption from DSA review and approval for Structural Safety and Fire & Life Safety: Types of exempt projects in this category can be found in DSA IR A-10, IR A-22, and in Appendix A of this document.

2.2 Exemption from DSA review and approval for Accessibility: Types of exempt projects in this category can be found in DSA IR A-10 and IR A-22. In addition, types of scope that can trigger the requirement for accessibility upgrades (along with the need to submit the project to DSA) are found in Appendix A of this document.

3. PROCESS TO OBTAIN DSA CONCURRENCE IF THE PROJECT IS EXEMPT FROM DSA REVIEW AND APPROVAL: It is not mandatory to obtain DSA concurrence that a project is exempt. However, some clients desire to have written concurrence from DSA. In those cases, the following process is provided:

- The applicant needs to complete form DSA 7 (replaced form DSA 39-1) and contact the appropriate DSA regional office to determine the best method to submit the form. DSA contact information is available at the following link:
www.dgs.ca.gov/dsa/AboutUs/contact.aspx
- Upon receipt of form DSA 7, DSA will assign an "exempt request" number to the project. The numbering will be sequential starting at E00001 for each regional office as follows:
 - Oakland regional office starts at: 01-E00001
 - Sacramento regional office starts at: 02-E00001
 - Los Angeles regional office starts at: 03-E00001
 - San Diego regional office starts at: 04-E00001
- DSA will open a "project exempt request" folder in DSAbbox and send an invite to the applicant and district contact as identified on the form DSA 7.
- The applicant will then upload the construction documents for the project into the DSAbbox folder.

EXEMPT CONCURRENCE

- The applicant will contact the DSA regional office and set up an over the counter (OTC) concurrence review for the project.
- At the OTC concurrence review, the applicant must remit a \$400 non-refundable fee, after which DSA staff, together with the applicant, will review the project. The possibilities for the outcome of the review are:
 - The project is found by DSA to meet the criteria to be exempt. In this case, DSA will sign the “Project is Exempt” section on form DSA 7 and upload it to the DSABox folder.
 - The project is found by DSA to not meet the exempt criteria. DSA will inform the applicant what scope in the project triggers the non-exempt decision and the applicant may:
 - 1) Choose to revise and resubmit the drawings, and again schedule an OTC concurrence review. This is limited to one additional review without remitting an additional \$400 fee.

Or

 - 2) If minor items need to be excluded from the scope of work, the applicant can note the changes on the plans electronically, at the OTC appointment, using their own portable system or the BlueBeam software on DSA’s computer. The revised plans will then be uploaded to the DSABox.
 - The project is found by DSA to not meet the exempt criteria. DSA will inform the applicant what scope in the project triggers the non-exempt decision. If the applicant decides to not revise and resubmit the drawings, DSA will sign the “Project is Not Exempt” section on form DSA 7 and upload it to the DSABox folder.
- If the project is not exempt it must be reviewed and approved by DSA. Submittal information is found on DSA’s website. Projects with minor qualifying scope can be plan reviewed OTC and/or otherwise expedited.

EXEMPT CONCURRENCE

Appendix A
Review/Approval Requirements for Structural & Fire & Life Safety

| No. | Project Type | DSA SS & FLS Review and Approval: Required?^[1] | DSA SS & FLS Review and Approval: Notes/References |
|------------|--|--|---|
| 1 | Heating, ventilation, and air conditioning (HVAC) | Yes | DSA approval is not required for HVAC unit replacement in kind with units of equal or lesser weight or in the same location, and no structural framing is being altered. Ensure automatic shutoff of the HVAC units where CFM exceeds 2000 (see CMC). |
| 2 | Reroofing with "cool" roof | No | Roof covering replacement and insulation is limited to type and weight of existing roof covering and insulation. |
| 3 | Weatherization/caulking | No | |
| 4a | Non-rated and non-safety window replacement (glazing only) | No | |
| 4b | Window replacement (frames and glazing) | Yes | DSA approval is not required if the entire project cost is below the lower threshold identified in DSA IR A-10. |
| 5a | Window shading devices—window screens (applied to glazing) | No | |
| 5b | Window shading devices—solar shading devices requiring structural attachment | Yes | DSA approval is not required if the entire project cost is below the lower threshold identified in DSA IR A-10, or not fire & life safety related. |
| 6 | Energy Management Systems (EMS) | No | |
| 7 | Lighting upgrades—relamping, ballast replacements, fixture replacement | No | Exterior light pole fixture replacement is required to be approved if the light poles are greater than 35 feet high, unless the entire project cost is below the lower threshold identified in DSA IR A-10. |
| 8 | Water heating upgrades | No | |
| 9 | Skylights | Yes | DSA approval is not required if the entire project cost is below the lower threshold identified in DSA IR A-10. |

EXEMPT CONCURRENCE

California Building Code Requirements for Accessibility Upgrades

| No. | Project Type | Path of Travel Access Upgrades: Required? | Path of Travel Access Upgrades: Applicable 2013 Code Sections |
|------------|--|--|--|
| 1 | Heating, ventilation, and air conditioning (HVAC) | No ^[2] | 11B-202.4 Exceptions: 7 |
| 2 | Reroofing with "cool" roof | No ^[2] | 11B-202.4 Exceptions: 7 |
| 3 | Weatherization/caulking | No ^[3] | 2-202 Definitions "Alterations" and 11B-202.4 Exceptions: 7 |
| 4a | Window replacement (glazing only) | No ^[4] | 2-202 Definitions "Alterations" and 11B-202.4 Exceptions: 7 |
| 4b | Window replacement (frames and glazing) | Yes ^[3] | 2-202 Definitions "Alterations" and 11B-202.4 |
| 5a | Window shading devices—window screens (applied to glazing) | No ^[5] | 2-202 Definitions "Alterations" and 11B-202.4 |
| 5b | Window shading devices—solar shading devices requiring structural attachment | Yes ^[6] | 2-202 Definitions "Alterations" and 11B-202.4 |
| 6 | Energy Management Systems (EMS) | No ^[7] | 2-202 Definitions "Alterations" and 11B-202.4 Exceptions: 7 |
| 7 | Lighting upgrades—relamping, ballast replacements, fixture replacement | No ^[8] | 2-202 Definitions "Alterations" and 11B-202.4 Exceptions: 7 |
| 8 | Water heating upgrades | No ^[9] | 2-202 Definitions "Alterations" and 11B-202.4 Exceptions: 7 |
| 9 | Skylights | Yes ^[10] | 2-202 Definitions "Alterations" and 11B-202.4 |

EXEMPT CONCURRENCE**Notes**

¹Exempted projects must comply with all currently effective design, construction, and inspection provisions contained in Title 24 as adopted by DSA and the State Fire Marshal (see DSA IR A-10).

²Projects consisting only of heating, ventilation, air conditioning, reroofing, electrical work not involving placement of switches and receptacles, cosmetic work that does not affect items regulated by this code, such as painting, and equipment not considered to be a part of the architecture of the building or area, such as computer terminals and office equipment, shall not be required to comply with 11B-202.4 unless they affect the usability of the building or facility.

³ALTERATION: A change, addition, or modification in construction, change in occupancy or use, or structural repair to an existing building or facility. Alterations include, but are not limited to, remodeling, renovation, rehabilitation, reconstruction, historic restoration, resurfacing of circulation paths or vehicular ways, changes or rearrangement of the structural parts or elements, and changes or rearrangement in the plan configuration of walls and full-height partitions. *Normal maintenance, reroofing, painting or wallpapering, or changes to mechanical and electrical systems are not alterations unless they affect the usability of the building or facility.*

⁴Replacement of glazing units is considered normal maintenance of the glazing system that **does not affect the "usability of the building"**; therefore, would not qualify as alterations under 11B-202.4.

⁵Replacement of screens is considered normal maintenance of a glazing subsystem that **does not affect the "usability of the building"**; therefore, would not qualify as alterations under 11B-202.4.

⁶The addition of fixed and operable solar shading devices, such as horizontal sun shades or vertical fins that require structural connections to the building or ground, is *"A change, addition, or modification in construction"* and would qualify as alterations under 11B-202.4.

⁷The addition of an Energy Management System would be a **"change to an electrical or mechanical system"** and not considered an alteration for purposes of accessibility under 11B-202.4. See note 4 above.

⁸Lighting Upgrades—relamping, ballast replacements, and fixture replacement are *"electrical work not involving placement of switches and receptacles."* See note 3 above. By definition, these upgrades are also *"changes to mechanical and electrical systems"* that would not qualify as alterations for purposes of accessibility upgrades under 11B-202.4.

⁹Upgrades to water heating systems are considered *"changes to mechanical and electrical systems"* and not alterations for purposes of accessibility upgrades. See note 5 above.

¹⁰The addition of skylights or solar tubes in the roof of an existing building would be *"A change, addition, or modification in construction"* and qualifies as an alteration. See note 5 above.