



RFP #773
PROFESSIONAL, TECHNICAL AND EXPERT SERVICES

Clark County Washington

RELEASE: WEDNESDAY, FEBRUARY 12, 2020
DUE DATE: WEDNESDAY, MARCH 11, 2020 by 3:00 p.m.

Request for Proposal for:

**LEICHER LANDFILL MICRO FLARE MANUFACTURE, DELIVERY and
TECHNICAL ASSISTANCE for INSTALLATION**

Submit one (1) original and three (3) complete copies of the Proposal to:

Proposals must be date and time stamped by Purchasing staff before 3:00 p.m. on due date.

Clark County
Office of Purchasing
P.O. Box 5000
1300 Franklin Street, 6th Floor, Suite 650
Vancouver, Washington 98660
564-397-2323

Refer Questions to Project Manager

Michael Davis
Public Health, Solid Waste
Mike.Davis@clark.wa.gov

General Terms and Conditions

ADMINISTRATIVE REQUIREMENTS - Contractors shall comply with all management and administrative requirements established by Washington Administrative Code (WAC), the Revised Code of the State of Washington (RCW), and any subsequent amendments or modifications, as applicable to providers licensed in the State of Washington.

ALL proposals submitted become the property of Clark County. It is understood and agreed that the prospective Proposer claims no proprietary rights to the ideas and written materials contained in or attached to the proposal submitted. Clark County has the right to reject or accept proprietary information.

AUTHORSHIP - Applicants must identify any assistance provided by agencies or individuals outside the proposer's own organization in preparing the proposal. No contingent fees for such assistance will be allowed to be paid under any contract resulting from this RFP.

CANCELLATION OF AWARD - Clark County reserves the right to immediately cancel an award if the contractual agreement has not been entered into by both parties or if new state regulations or policy make it necessary to change the program purpose or content, discontinue such programs, or impose funding reductions. In those cases where negotiation of contract activities are necessary, Clark County reserves the right to limit the period of negotiation to sixty (60) days after which time funds may be unencumbered.

CONFIDENTIALLY - Proposer shall comply with all applicable state and federal laws governing the confidentiality of information."

CONFLICT OF INTEREST - All proposals submitted must contain a statement disclosing or denying any interest, financial or otherwise, that any employee or official of Clark County or the appropriate Advisory Board may have in the proposing agency or proposed project.

CONSORTIUM OF AGENCIES - Any consortium of companies or agencies submitting a proposal must certify that each company or agency of the consortium can meet the requirements set forth in the RFP.

COST OF PROPOSAL & AWARD - The contract award will not be final until Clark County and the prospective contractor have executed a contractual agreement. The contractual agreement consists of the following parts: (a) the basic provisions and general terms and conditions, (b) the special terms and conditions, (c) the project description and goals (Statement of Work), and (d) the budget and payment terms. Clark County is not responsible for any costs incurred prior to the effective date of the contract. Clark County reserves the right to make an award without further negotiation of the proposal submitted. Therefore, the proposal should be submitted in final form from a budgetary, technical, and programmatic standpoint.

DISPUTES: Clark County encourages the use of informal resolution to address complaints or disputes arising over any actions in implementing the provisions of this RFP. Written complaints should be addressed to Clark County – Purchasing, P.O. Box 5000, Vancouver, Washington 98666-5000.

DIVERSITY IN EMPLOYMENT AND CONTRACTING REQUIREMENTS - It is the policy of Clark County to require equal opportunity in employment and services subject to eligibility standards that may be required for a specific program. Clark County is an equal opportunity employer and is committed to providing equal opportunity in employment and in access to the provision of all county services. Clark County's Equal Employment Opportunity Plan is available at <http://www.clark.wa.gov/hr/documents.html>. This commitment applies regardless of race, color, religion, creed, sex, marital status, national origin, disability, age, veteran status, on-the-job injury, or sexual orientation. Employment decisions are made without consideration of these or any other factors that are prohibited by law. In compliance with department of Labor Regulations implementing Section 504 of the Rehabilitation Act of 1973, as amended, no qualified handicapped individual shall be discriminated against in admission or access to any program or activity. The prospective contractor must agree to provide equal opportunity in the administration of the contract, and its subcontracts or other agreements.

ENVIRONMENTALLY RESPONSIBLE PURCHASING PROGRAM - Clark County has implemented an Environmentally Responsible Purchasing Policy with a goal to reduce negative impacts on human health and the environment. Negative environmental impacts include, but are not limited to, greenhouse gases, air pollution emissions, water contamination, waste from the manufacturing process and waste in packaging. This policy also seeks to increase: 1) water and energy efficiency; 2)

renewable energy sources; 3) use of products with recycled content; 4) product durability; 5) use of products that can be recycled, reused, or composted at the end of its life cycle. Product criteria have been established on the Green Purchasing List <http://www.clark.wa.gov/general-services/purchasing/erp/environmental.html>

INDEPENDENT PRICE DETERMINATION - The prospective contractor guarantees that, in connection with this proposal, the prices and/or cost data have been arrived at independently, without consultation, communication, or agreement for the purpose of restricting competition. This does not preclude or impede the formation of a consortium of companies and/or agencies for purposes of engaging in jointly sponsored proposals.

INTERLOCAL AGREEMENT - Clark County has made this RFP subject to Washington State statute RCW 39.34. Therefore the bidder may, at the bidders' option, extend identical prices and services to other public agencies wishing to participate in this RFP. Each public agency wishing to utilize this RFP will issue a purchase order (or contract) binding only their agency. Each contract is between the proposer and the individual agency with no liability to Clark County.

LIMITATION - This RFP does not commit Clark County to award a contract, to pay any costs incurred in the preparation of a response to this RFP, or to procure or contract for services or supplies.

LATE PROPOSALS - A proposal received after the date and time indicated above will not be accepted. No exceptions will be made.

ORAL PRESENTATIONS - An oral presentation may be required of those prospective contractors whose proposals are under consideration. Prospective contractors may be informed that an oral presentation is desired and will be notified of the date, time and location the oral presentation is to be conducted.

OTHER AUDIT/MONITORING REQUIREMENTS - In addition, auditing or monitoring for the following purposes will be conducted at the discretion of Clark County: Fund accountability; Contract compliance; and Program performance.

PRICE WARRANT - The proposal shall warrant that the costs quoted for services in response to the RFP are not in excess of those which would be charged any other individual or entity for the same services performed by the prospective contractor.

PROTESTS - must be submitted to the Purchasing Department.

PUBLIC SAFETY - may require limiting access to public work sites, public facilities, and public offices, sometimes without advance notice. The successful Proposer's employees and agents shall carry sufficient identification to show by whom they are employed and display it upon request to security personnel. County project managers have discretion to require the successful Proposer's employees and agents to be escorted to and from any public office, facility or work site if national or local security appears to require it.

REJECTION OF PROPOSALS - Clark County reserves the right to accept or reject any or all proposals received as a result of this RFP, to negotiate with any or all prospective contractors on modifications to proposals, to waive formalities, to postpone award, or to cancel in part or in its entirety this RFP if it is in the best interest of Clark County to do so.

SUBCONTRACTING - No activities or services included as a part of this proposal may be subcontracted to another organization, firm, or individual without the approval of Clark County. Such intent to subcontract shall be clearly identified in the proposal. It is understood that the contractor is held responsible for the satisfactory accomplishment of the service or activities included in a subcontract.

VERBAL PROPOSALS - Verbal proposals will not be considered in making the award of any contract as a result of this RFP.

WORKERS COMPENSATION INSURANCE - The contractor shall comply with R.C.W. Title 51- with minimum coverage limits of \$500,000 for each accident, or provide evidence that State law does not require such coverage.

FOR ALTERNATIVE FORMATS
Clark County ADA Office: V: 564-397-2025
TTY: 564-397-2445
ADA@Clark.wa.gov

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Leichner Landfill Micro Flare Manufacture, Delivery and Technical Assistance for Installation

Part I Proposal Requirements

Section IA General Information

1. Introduction

The purpose of this Request for Proposal (RFP) is to obtain proposals to supply and deliver a landfill gas (LFG) flare for the Leichner Landfill. Requirements for the LFG flare are as described below.
2. Background

The County is soliciting an RFP to provide all labor, material, and equipment necessary to furnish, test, and deliver an enclosed LFG flare to the Leichner Landfill (address below).

Leichner Landfill
9411 NE 94th Avenue
Vancouver, WA 98662

The flare to be provided is intended to be a replacement for the existing flare at the Landfill. Replacement of the existing flare is required as the existing flare is over sized for the quality and quantity of LFG being produced within the Landfill. Due to the age of the waste in the Landfill, the average LFG flow rate to the flare in 2018 (from the gas collection and control system or GCCS) was 110.5 standard cubic feet per minute (scfm) at 39.2 percent by volume (% vol.) methane (86.6 scfm normalized to 50% vol. methane). Because of the declining LFG generation rates, the County would like to replace the flare with a more appropriately sized enclosed flare with greater turndown capability.

SCS Engineers (SCS) will provide engineering and field support for the installation and startup as "County Contractor". Approved subcontractors will provide the following services:

 - Structural-anchor design for the flare
 - Electrical supply and connections
 - Removal of existing flare, and offload of supplied flare
 - Control panel installation and programming
 - Flare exhaust stack testing
3. Scope of Project

The selected Supplier/Vendor shall supply and deliver one (1) LFG flare with an operating range of 9 to 90 scfm (at 50% vol. methane) via staged burner nozzles in a single burner assembly. The scope includes all system components and appurtenances for installation including, but not limited to the following:

 - Automated shutoff valve
 - Flame arrester
 - Enclosed flare
 - Instrumentation for temperature, pressure, flame scanner, etc.
 - Pilot fuel train
 - Pre-installed, flare mounted wiring, electrical devices, piping, valves, and appurtenances
 - All goods shipped FOB Destination to Leichner Landfill

The supplied enclosed LFG flare shall meet the procurement specifications included in Attachment C.

The Supplier/Vender shall also provide three (3) days of onsite startup and training services by a factory field services technician. In addition the Supplier/Vender shall provide four (4) copies of the following:

 - Engineering submittals
 - As-built drawings
 - Operations and maintenance manuals
4. Project Funding

Funding for this project is provided through the Leichner Landfill Financial Assurance Reserve Fund (FARF). Allocation of funds for this RFP will be established based on the funds requested in the selected proposal.

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5. Timeline for Selection
- The following dates are the **intended** timeline:
- | | |
|------------------------------------|---------------------|
| Proposals due | March 11, 2020 |
| Proposal review/evaluation period | March 16 – 20, 2020 |
| Selection committee recommendation | March 20, 2020 |
| Contract negotiation/execution | March 23 – 31, 2020 |
| Contract intended to begin | April 1, 2020 |
6. Employment Verification
- “Effective November 1st, 2010, to be considered **responsive** to any formal Clark County Bid/RFP or Small Works Quote, all vendors shall submit before, include with their response or within 24 hours after submittal, a recent copy of their E-Verify MOU or proof of pending enrollment. The awarded contractor shall be responsible to provide Clark County with the same E-Verify enrollment documentation for each sub-contractor (\$25,000 or more) within thirty days after the sub-contractor starts work. Contractors and sub-contractors shall provide a report(s) showing status of new employee’s hired after the date of the MOU. The status report shall be directed to the county department project manager at the end of the contract, or annually, which ever comes first. E-Verify information and enrollment is available at the Department of Homeland Security web page: www.dhs.gov/E-Verify
- How to submit the MOU in advance of the submittal date:**
1. Hand deliver to 1300 Franklin St, Suite 650, Vancouver, WA 98660, or;
 2. E-mail: koni.odell@clark.wa.gov or priscilla.ricci@clark.wa.gov
- Note : Sole Proprietors are exempt.*

Section IB

Work Requirements

1. Required Services
- The chosen Supplier/Vendor will provide the LFG flare and required appurtenances per the procurement and equipment specifications included in Attachment C. The Supplier/Vendor will ship the LFG flare and appurtenances to the Landfill with FOB Destination Shipping terms.
2. County Performed Work
- County Contractor and approved subcontractors will inspect Flare upon arrival. Provide unloading, erection, and installation of equipment shipped loose (e.g. auto shutoff valve, and flame arrestor), interconnection to existing pipe and electrical systems, and emissions testing.
3. Deliverables & Schedule
- The expected schedule for deliverables from the bidding and proposal phase of the project, are described in Section IA (5) above. Deliverables required for the bidding and proposal phase of the project are as outlined in the procurement specifications included in Attachment C.
4. Place of Performance
- Contract performance shall take place at the Supplier/Vendors facility for testing and quality assurance and quality control (QA/QC) testing, with final delivery and startup testing at the Landfill.
5. Period of Performance
- A contract awarded as a result of this RFP intendeds to begin on April 1, 2020 and end December 31, 2020. The County reserved the right to extend the contract resulting from this RFP for up to three (3) thirty (30) day increments with the same terms and conditions to allow for unforeseen circumstance.
- The time of completion will be sixteen (16) weeks from the date of contract/purchase order is expected by the County. The County will accept earlier delivery.

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6. Prevailing Wage Pursuant to State of Washington RCW 39.12, all payment for salaries and wages shall conform to State of Washington Department of Labor and Industries as prevailing wage rates. For this project select the Clark County rates that apply on the bid opening date from either of these sites:

<http://www.wsdot.wa.gov/Design/ProjectDev/WageRates/default.htm>

<http://www.lni.wa.gov/TradesLicensing/PrevWage/WageRates>

Before payment is made by the Local Agency of any sums due under this contract, the Local Agency must receive from the Contractor and each Subcontractor a copy of "Statement of Intent to Pay Prevailing Wages" (Form L & I Number 700-29) approved by the Washington State Department of Labor and Industries.

A fee of \$45.00 per each "Statement of Intent to Pay Prevailing Wages" and "Affidavit of Wages Paid" is required to accompany each form submitted to this Department of Labor and Industries. The Contractor is responsible for payment of these fees and shall make all applications directly to the Department of Labor and Industries. These fees shall be incidental to all the bid items of this contract

7. Public Disclosure This procurement is subject to the Washington Public Records Act (the "Act"), chapter 42.56 RCW. Once in the County's possession, all of the RFP Submittals shall be considered public records and available for public records inspection and copying, unless exempt under the Act.

If a Respondent or Proposer considers any portion of an RFP Submittal to be protected under the law, whether in electronic or hard copy form, the Respondent or Proposer shall clearly identify each such portion with the word "PROPRIETARY". If a request is made for disclosure of such a portion, the County will determine whether it should be made available under the Act. If the county determines that such a record(s) is subject to disclosure, the County will notify the Respondent or Proposer in writing of the request and allow the Respondent or Proposer ten (10) days to obtain a court order enjoining release of the record(s). If the Respondent or Proposer does not take such action within the ten (10) day period, the County will release the portions of the RFP Submittal deemed subject to disclosure. All Respondents and Proposers who provide RFP Submittals for this procurement accept the procedures described above and agree that the County shall not be responsible or liable in any way for any losses that the party may incur from the disclosure of records to a third party who requests them.

7. Insurance/Bond

A. Commercial General Liability (CGL) Insurance written under ISO Form CG0001 or its latest equivalent with minimum limits of \$1,000,000 per occurrence and in the aggregate for each one year policy period. This policy will renew annually. This coverage may be any combination of primary, umbrella or excess liability coverage affording total liability limits of not less than \$1,000,000 per occurrence and in the aggregate. However, if other policies are added they must be a follow-form policy in language, renewal date, and have no more exclusions than the underlying coverage. Products and Completed Operations coverage shall be provided for a period of three years following Substantial Completion of the Work. The deductible will not be more than \$50,000 unless prior arrangements are made with Clark County on a case by case basis; the criterion is the Contractor's liquidity and ability to pay from its own resources regardless of coverage status due to cancellation, reservation of rights, or other no-coverage-enforce reason. Coverage shall not contain any endorsement(s) excluding nor limiting Product/Completed Operations, Contractual Liability or Cross Liability.

B. Automobile

If the Proposer or its employees use motor vehicles in conducting activities under this Contract, liability insurance covering bodily injury and property damage shall be provided by the Proposer through a commercial automobile insurance policy. The policy shall cover all owned and non-owned vehicles. Such insurance shall have minimum limits of \$500,000 per occurrence, combined single limit for bodily injury liability and property damage liability with a \$1,000,000

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annual aggregate limit. If the Proposer does not use motor vehicles in conducting activities under this Contract, then written confirmation to that effect on Proposer letterhead shall be submitted by the Proposer.

C. Proof of Insurance

Proof of Insurance shall be provided prior to the starting of the contract performance.

Proof will be on an ACORD Certificate(s) of Liability Insurance, which the Proposer shall provide to Clark County. Each certificate will show the coverage, deductible and policy period. Policies shall be endorsed to state that coverage will not be suspended, voided, canceled or reduced without a 30 day written notice by mail. It is the Proposer's responsibility to provide evidence of continuing coverage during the overlap periods of the policy and the contract.

All policies must have a Best's Rating of A-VII or better.

8. Plan Holders List

All proposers are required to be listed on the plan holders list.

✓ Prior to submission of proposal, please confirm your organization is on the Plan Holders List below:

To view the Plan Holders List, please click on the link below or copy and paste into your browser.

Clark County RFP site:

<http://www.clark.wa.gov/general-services/purchasing/rfp.html>

- If your organization is NOT listed, submit Attachment B - 'Letter of Interest' to ensure your inclusion.
- Proposals received by Clark County by proposers not included on the Plan Holders List may be considered non-responsive.

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Part II Proposal Preparation and Submittal

Section IIA Pre-Submittal Meeting / Clarification

1. Pre-Submittal Meeting
There will be no pre-submittal meeting or site visit scheduled for this project.
2. Proposal Clarification
Questions and Requests for Clarification regarding this Request for Proposal must be directed in writing, via email, to the person listed on the cover page. The deadline for submitting such questions/clarifications is seven (7) calendar days prior to the due date for proposals.

An addendum will be issued no later than six (6) calendar days prior to the proposal due date to all recorded holders of the RFP if a substantive clarification is in order.

The Questions & Answers/Clarifications are available for review at the link below. Each proposer is strongly encouraged to review this document prior to submitting their proposal.

Clark County RFP site:
<http://www.clark.wa.gov/general-services/purchasing/rfp.html>

Section IIB Proposal Submission

1. Proposals Due
Sealed proposals must be received no later than the date, time and location specified on the cover of this document.

The outside of the envelope/package shall clearly identify:
 1. RFP Number and;
 2. TITLE and;
 3. Name and address of the proposer.
Responses received after submittal time will not be considered and will be returned to the Proposer - unopened.

Proposals received with insufficient copies (as noted on the cover of this document) cannot be properly disseminated to the Review Committee and other reviewers for necessary action, therefore, may not be accepted.
2. Proposal
Proposals must be clear, succinct and not exceed 10 pages, excluding resumes, E-Verify and coversheet. Proposer's who submit more than the pages indicated may not have the additional pages of the proposal read or considered.

For purposes of review and in the interest of the County, the County encourages the use of submittal materials (i.e. paper, dividers, binders, brochures, etc.) that contain post-consumer recycled content and are readily recyclable.

The County discourages the use of materials that cannot be readily recycled such as PVC (vinyl) binders, spiral bindings, and plastic or glossy covers or dividers. Alternative bindings such as reusable/recyclable binding posts, reusable binder clips or binder rings, and recyclable cardboard/paperboard binders are examples of preferable submittal materials.

Proposers are encouraged to print/copy on both sides of a single sheet of paper wherever applicable; if sheets are printed on both sides, it is considered to be two pages. Color is

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acceptable, but content should not be lost by black-and-white printing or copying.

All submittals will be evaluated on the completeness and quality of the content. Only those Proposers providing complete information as required will be considered for evaluation. The ability to follow these instructions demonstrates attention to detail.

Additional support documents, such as sales brochures, should be included with each copy unless otherwise specified.

Section IIC

Proposal Content

1. Cover Sheet
This form is to be used as your proposal Cover Sheet
See Cover Sheet - Attachment A

2. Project Team
Provide a summary describing the project team organization, including a list of any sub-contractors or consultants. The summary shall contain an organizational chart showing area of responsibilities and professional titles of pertinent positions. Team members, except for the leads, do not need to be identified by name in the chart. If the organizational chart includes members from sub-contractors or consultants, include any past experience working together.

3. Management Approach
The Proposer shall describe their approach to managing this project. Provide examples to show that timelines were met on previous projects.

4. Respondent's Capabilities
The proposer shall define their capability to supply the specified LFG flare. Provide a list of five (5) similar projects of equipment with similar capacity. Include copies of the manufacturer's testing report for a minimum of three (3) similar units with the qualifications submittal. Previous projects that were successful in demonstrating permit compliance with local agencies are preferred.

5. Project Approach and Understanding
The Proposer shall provide documentation to demonstrate their understanding of the project. This includes, but is not limited to; parts and equipment lists, estimated manufacturing and delivery schedules for finished products, project options, and sample warranties.

6. Proposed Cost
The proposed cost shall include all costs for supplying and delivering an enclosed LFG flare and ancillary components to the project site. Including all labor and materials for procurement of components, shop assembly, fabrication, shop testing, FOB Destination shipping, documentation, and field startup and testing.

7. Employment Verification
Please refer to section 1A.6. – e-Verify
IMPORTANT NOTE: Include this portion of the response immediately AFTER the cover page, if not already on file with Clark County. Current vendors on file can be viewed at:
<https://www.clark.wa.gov/general-services/purchasing-overview>

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Part III Proposal Evaluation & Contract Award

Section IIIA Proposal Review and Selection

1. Evaluation and Selection: Proposals received in response to this RFP will be evaluated by a Review Committee. Committee review results and recommendations may be presented to an appropriate advisory board prior to the consent process with the Clark County Council.
2. Evaluation Criteria Scoring: Each proposal received in response to the RFP will be objectively evaluated and rated according to a specified point system.

A one hundred (100) point system will be used, weighted against the following criteria:

Proposal approach/quality	10
Creativity / Experience	10
Work history / Examples	20
Product Demonstration	20
Cost	5
References	25
Criteria Specific to your project needs	10
Total Points	100

Section IIIB Contract Award

1. Consultant Selection: The County will award a contract to the highest scoring Proposer. Should the County not reach a favorable agreement with the highest scoring Proposer, the County shall suspend or terminate negotiations and commence negotiations with the second highest scoring Proposer and so on until a favorable agreement is reached.
2. Contract Development: The proposal and all responses provided by the successful Proposer may become a part of the final contract.
3. Award Review: The public may view proposal documents after contract execution. However, any proprietary information so designated by the Proposer as a 'trade secret' will not be disclosed unless the Clark County Prosecuting Attorney determines that disclosure is required. At this time, Proposers not awarded the contract, may seek additional clarification or debriefing, request time to review the selection procedures or discuss the scoring methods utilized by the evaluation committee.
4. Orientation/Kick-off Meeting: Immediately following award of the contract, the County will schedule a meeting with the Supplier/Vendor to coordinate project submittals as outlined in the technical specifications included in Attachment C.

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Attachment A: COVER SHEET

General Information:

Legal Name of Applicant/Company/Agency _____

Street Address _____ City _____ State _____ Zip _____

Contact Person _____ Title _____

Phone _____ Fax _____

Program Location (if different than above) _____

Email address _____

Tax Identification Number _____

ADDENDUM:

Proposer shall acknowledge receipt of Addenda by checking the appropriate box(es).

None 1 2 3 4 5 6

NOTE: Failure to acknowledge receipt of Addendum may render the proposal non-responsive.

Total Cost of this Proposal \$ _____

I certify that to the best of my knowledge the information contained in this proposal is accurate and complete and that I have the legal authority to commit this agency to a contractual agreement. I realize the final funding for any service is based upon funding levels, and the approval of the Clark County Council.

Signature

Date

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Attachment B: LETTER OF INTEREST

Legal Name of Applicant Agency _____

Street Address _____

City _____ State _____ Zip _____

Contact Person _____ Title _____

Phone _____ Fax _____

Program Location (if different than above) _____

Email address _____

- All proposers are required to be included on the plan holders list.
- If your organization is NOT listed, submit the 'Letter of Interest' to ensure your inclusion.

Email Letter of Interest: Attachment B to: Koni.Odell@clark.wa.gov or Priscilla.Ricci@clark.wa.gov

Clark County web link:

<http://www.clark.wa.gov/general-services/purchasing/rfp.html>

This document will only be used to add a proposer to the plan holders list. Submitting this document does not commit proposer to provide services to Clark County, nor is it required to be submitted with proposal.

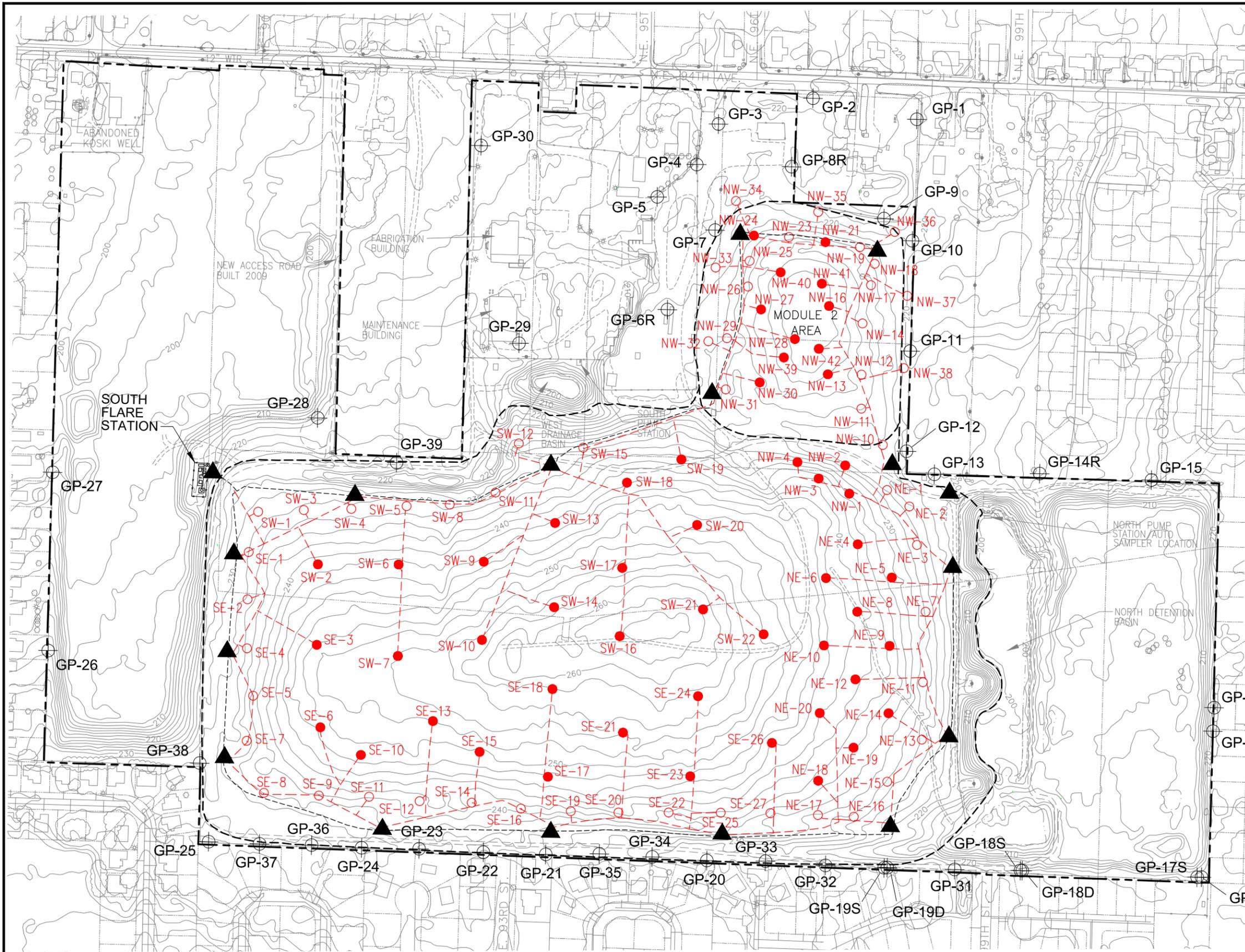
Proposals may be considered non-responsive if the Proposer is not listed on the plan holders list.

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Attachment C: ADDITIONAL ATTACHMENTS

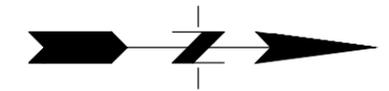
- Site Map and GCCS Plan
- Specifications for Flare Procurement, for the Leichner Landfill, SCS, May 2019
- Submittal Log for Flare Procurement, for the Leichner Landfill, SCS, May 2019



LEGEND:

- ⊕ GP-30 Compliance Landfill Gas Monitoring Probe Location
- SW-1 Vertical Landfill Gas Extraction Well
- SW-2 Extraction Wells Proposed for Additional Data Collection
- ▲ Condensate Sump
- Gas Collection Piping
- Property Boundary
- Limit of Landfill Cover and Approximate Edge of Waste

NOTE:
Topography Taken From Clark County GIS, December 2008



SCS ENGINEERS
Environmental Consultants and Contractors
15940 S.W. 72nd Avenue
Portland, Oregon 97224
(503) 639-9201 FAX: (503) 684-6948



PROJECT NO.	04219030.14	DES BY	E.F.
SCALE	AS SHOWN	CHK BY	D.L.
CAD FILE	FIGURE 4-1	APP BY	L.C.

LANDFILL GAS PROBE AND
EXTRACTION WELL LOCATIONS
LEICHER LANDFILL
VANCOUVER, WASHINGTON

DATE	MARCH 2019
FIGURE	4-1

Specifications for Flare Procurement

Prepared for:

Clark County Public Works
Solid Waste Division
P.O. Box 9810
Vancouver, WA 98666

For the:

Leichner Landfill
9411 NE 94th Avenue
Vancouver, WA 98622

SCS ENGINEERS

04219030.16 | May 28, 2019

Prepared by:
SCS Engineers
2405 140th Ave NE, Suite 107
Bellevue, WA 98005
425-746-4600

Specifications for Flare Procurement

Clark County Public Works, Solid Waste Division

For the:
Leichner Landfill
9411 NE 94th Avenue
Vancouver, WA 98622

CERTIFICATION

These specifications describe the requirements for procurement of a landfill gas (LFG) flare to replace the existing flare at the Leichner Landfill, located in Vancouver, Clark County, Washington. The engineering material and data contained within these specifications were prepared under the supervision and direction of the undersigned.

SCS Engineers



Samuel E. Adlington, PE (WA)
Senior Project Engineer

A handwritten signature in blue ink, appearing to read "Ted Massart", is written above a horizontal line.

Ted Massart
Senior Project Engineer

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SECTION 01 33 00 - SUBMITTAL PROCEDURES

Part 1 General

1.01 Section Includes

- A. Submittal Procedures
- B. Construction Progress Schedules
- C. Shop Drawings
- D. Product Data
- E. Samples
- F. Manufacturers' Instructions
- G. Manufacturers' Certificates

1.02 Submittal Procedures

- A. Submittals must be presented in the format acceptable to and approved of in advance by the Owner and Engineer.
- B. Accompany each submittal with a letter of transmittal showing all information required for identification and tracking. Identify Project, Supplier, Manufacturer, Contractor, and Subcontractor; pertinent Drawing sheet and detail number(s), and Specification Section number, as appropriate.
- C. On at least the first page of each submittal, and elsewhere as required for identification, show the submittal number to which the item belongs.
- D. Number the transmittal forms and corresponding submittals sequentially. Number each resubmittal using the original submittal number, a period, and a numeric suffix. For example, the first resubmittal of submittal 3 would be number 3.1. Resubmittals shall be transmitted with a new letter of transmittal, and shall cite the original submittal number for reference.
- E. Submit the number of copies of Shop Drawings and data required to be returned, plus four (4) copies to be retained by the Owner. Prior to each submittal, carefully review and coordinate all shop drawings and data furnished by Suppliers and Subcontractors for accuracy and for conformance with requirements of the specifications.
- F. Identify variations from Specifications and Products that would benefit the Owner and the completed Work, and highlight the advantages of such products. Any request to substitute an alternate product must be submitted to the Engineer in writing as part of the Tender documents and shall include complete product specifications addressing all

- specifications outlined within this section and the benefits to the Owner resulting from the substitution.
- G. Submittals shall clearly show drawings, sketches, catalog cuts, or letters from supplier which demonstrate compliance with the specific requirements of the Specifications. If compliance is not clearly demonstrated, the submittal will be rejected.
 - H. Data and information included in each specification shall indicate the guaranteed performance, predicted performance, interface requirements, and construction features of all furnished materials and equipment. The accuracy of such information and the compatibility of such information with overall performance requirements specified by Owner shall be the sole responsibility of the Supplier, Manufacturer, and Contractor.
 - I. Provide space for Supplier, Manufacturer, and/or Contractor and Owner review comments, signature and/or stamps.
 - J. Revise and resubmit submittals as required, clearly identifying all changes made since previous submittal. The Supplier, Manufacturer, and/or Contractor is solely responsible for producing and submitting accurate and relevant submittals. The Engineer will review and respond to a maximum of two revisions for each submittal.
 - K. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.
 - L. Make submittals of Shop Drawings, Samples, substitution requests, and other items in accordance with the provisions of this Section.
 - M. Apply Contractor's stamp, signed or initialed certifying that review, verifications or products required, field dimensions, adjacent construction work, and coordination of information, is in accordance with the requirements of the Work and Specifications.
 - N. Make submittals in groups containing all associated items. Partial submittals will be rejected as not complying with provisions of the Specifications.
 - O. Submittals shall be scheduled to expedite the Project. Deliver submittals to Owner at his/her business address, unless otherwise directed. Coordinate submission of related items. Make submittals far enough in advance of scheduled installation dates to provide adequate time for reviews, for shipping time between parties, for securing necessary approvals, for possible revisions and resubmittals, and for placing orders and taking delivery of materials.
 - P. If not otherwise noted in the Contract, allow at least ten (10) working days for review by the Owner following receipt of the submittal by the Owner.

1.03 Construction Schedules

- A. Submit initial progress schedule in duplicate for Owner's review within 10 working days after date established in the Notice to Proceed.
- B. Revise and resubmit each month with request for payment.

- C. Submit revised schedules with each Application for Payment, identifying changes since previous version.
- D. Indicate estimated percentage of completion for each item of Work at each submission.

1.04 Shop Drawings

A. General

1. Coordinate and check all shop drawings furnished by Suppliers and Subcontractors for accuracy and for conformance with requirements of the Specifications.

B. Drawings and Transmittals

1. General

- a. Supply all drawings, data sheets, performance curves, test reports, and instruction manuals as specified herein.
- b. The drawings and data submitted shall include sufficient detail and clarity to enable the Owner to determine that the proposal or design is in compliance with the Specifications. If standard drawings and/or standard published descriptive data are submitted, any modifications required and intended by the Supplier, Manufacturer, and/or Contractor to meet the requirements of each Specification shall be clearly indicated.
- c. Data and information included in each specification shall indicate the guaranteed performance, predicted performance, interface requirements, and construction features of all Contractor-furnished materials and equipment. The accuracy of such information and the compatibility of such information with overall performance requirements specified by Owner shall be the sole responsibility of the Supplier, Manufacturer, and/or Contractor.

2. Design Submittals

- a. Submit drawings, data, and other required information within the specified time limit.
- b. The following drawing requirements shall be met:
 - 1) All measurements shall be in U.S. units. S.I. metric units may be provided within parenthesis. All writing shall be in English.
 - 2) Drawing size shall not exceed ANSI D size (22-inch x 34-inch).
 - 3) Preliminary drawings shall be reproducible AutoCAD and Adobe Reader type for sizes greater than ANSI B size (11-inch x 17-inch).
 - 4) Final (certified) drawings shall be AutoCAD and Adobe Reader type.

- 5) Final (certified) drawings shall be marked as "CERTIFIED" with an accompanying signature and date.
 - 6) When a drawing is revised, a revision number shall be clearly displayed in or near the title block. Current revisions shall be so indicated by circling the affected portions of the drawing.
- c. Furnish certified general arrangement drawings and outline drawings showing all major equipment, component parts and accessories, assembly, all interface connections to related equipment, disassembly clearances and magnitude of permissible reaction forces and moments at major piping connections of equipment, and equipment center of gravity.
- d. Furnish certified detailed drawings to enable Owner to verify design of foundation, supports, and equipment interfacing. Connection-points and foundation drawings shall be fully dimensioned. Connection details shall be fully identified. Drawing information shall include as a minimum:
- 1) Component and auxiliary system equipment, flow diagrams including instrumentation, piping, and valve arrangement drawings.
 - 2) Foundation loading, piping and valves loading, and clearance dimensions including magnitude and direction of loads for all load cases.
 - 3) Anchor bolt and embedded parts size, location, and details.
 - 4) Pipe and conduit sleeve sizes and locations.
 - 5) Certified wiring diagrams, interconnection wiring diagrams.
 - 6) Instrument board, cabinet and panel layout, and terminal identification drawings and diagrams.
 - 7) Wire and cable designation drawings.
 - 8) Control logic diagrams.
 - 9) Materials designations shall be indicated on assembly drawing.
 - 10) Complete process and instrumentation drawings.
- e. Provide adequate certified information covering installation, operation and maintenance requirements. As a minimum the following information shall be furnished.
- 1) Installation and erection drawings and details; including, but not limited to welding and/or bolting specifications and extent of field work required.

- 2) Operating, maintenance, and repair (Instruction) Manuals.
- 3) Insulation and lagging requirements.
- 4) Record of all clearances, tolerances, and other pertinent data required for installation.
- 5) Foundation, load and anchorage detail requirements.
- 6) List of loose instruments, instrument panels, piping, tubing, and accessories.
- 7) Erection procedures.
- 8) Estimated total weight of components shipped fully assembled.
- 9) Shipping Splits: Approximate weight and size of major pieces.
- 10) Field assembly requirements of components (i.e., bolted or welded, lineal feet (meter) of field weld, if applicable, etc.).

C. Technical Data

1. Provide certified data, including graphs, curves, and other pertinent information for the materials, equipment, and machinery. Technical data shall include the following:
 - a. A signed Certified of Compliance stating the following:
"All work provided under this Specification complies with all requirements of this Specification and accepted deviations."
 - b. Data Sheets (pumps, motors, valves, fans, louvers, etc.).
 - c. Documents identifying deviations and their acceptance.
 - d. Manufacturer's Data Report for ASME Code stamped items.
 - e. Materials Test Reports where required by governing Codes or Standards.
 - f. Non-destructive examination procedures and results.
 - g. Shop Test results.
 - h. Field Test results.
 - i. Electrical Test results.
 - j. Welding procedures.
 - k. Records of all major weld repairs and related processing and examination.

- I. A complete list of all special tools and gauges of custom manufacture necessary to overhaul, operate, adjust, or maintain equipment.

1.05 Product Data

- A. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project.
- B. After review, distribute in accordance with paragraph 1.04 of this Section. Where contents of submitted manufacturer's literature include data not pertinent to the submittal, clearly indicate which portions of the contents are being submitted for review.

1.06 Samples

- A. Submit samples to illustrate functional and aesthetic characteristics of the Product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
- B. Submit samples of finishes from the full range of manufacturers' standard colors, textures, and patterns for Owner's selection.
- C. Identify each sample and include full Project information with each sample.
- D. One sample will be retained by Owner.

1.07 Manufacturer's Instructions

- A. When specified in individual specification Sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for Product Data.
- B. Identify conflicts between manufacturers' instructions and Contract Documents.
- C. All manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in strict accordance with manufacturer's printed directions, unless otherwise specified. Furnish bound copies of manufacturer's printed specifications for installation, use or maintenance to Owner.

1.08 Manufacturer's Certificates

- A. When specified in individual Specification Sections, submit manufacturer's certificate to Owner for review, in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Owner.

Part 2 Products

2.01 Not Used

Part 3 Execution

3.01 Not Used

**** END OF SECTION ****

SECTION 01 42 19 - REFERENCE STANDARDS

Part 1 General

1.01 Section Includes

- A. Quality Assurance
- B. Schedule of References

1.02 Quality Assurance

- A. For products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. All codes/standards shall be the latest issue of specified codes/standards as amended and revised to the tender closing date, except when a year date is mentioned.
- C. Should specified reference standards conflict with Specifications, request clarification from Engineer before proceeding.
- D. The Supplier, Manufacturer, and/or Contractor shall supply to the Engineer, on request, satisfactory evidence that all equipment and material complies with Standard Specification or test requirements.
- E. When references to the following capitalized abbreviations are made, they refer to specifications, standards or methods of the respective association. Abbreviations listed herein, but not mentioned in the specifications, shall be disregarded.
- F. All references to specifications, standards or methods of technical associations refer to the latest adopted revision, including all amendments.

1.03 Schedule of References

AABC	Associated Air Balance Council 1518 K Street NW Washington DC 20005
ACI	American Concrete Institute Washington State Chapter 22223 7th Ave S. Des Moines, WA 98198
ADC	Air Diffusion Council 1901 N. Roselle Road, Suite 800 Schaumburg, IL 60195
AGC	Associated General Contractors of America 2300 Wilson Blvd., Suite 400 Arlington, VA 22201

- ASME American Society of Mechanical Engineers
Three Park Avenue
New York, NY 10016-5990
800-843-2763 (U.S./Canada)
- AISC American Institute of Steel Construction
One East Wacker Drive, Suite 700
Chicago, IL 60601
- AISI American Iron and Steel Institute
1140 Connecticut Ave., NW
Suite 705
Washington, D.C. 20036
- AMCA Air Movement and Control Association
30 West University Drive
Arlington Heights, IL 60004
- ANSI American National Standards Institute
1819 L Street, NW (between 18th and 19th Streets)
6th floor
Washington, DC 20036
- ASTM ASTM International
100 Barr Harbor Drive
PO Box C700
West Conshohocken, PA 19428-2959
- AWS American Welding Society
550 NW LeJeune Road
Miami, FL 33126
- CDA Copper Development Association
260 Madison Avenue
New York, NY 10016
- CRSI Concrete Reinforcing Steel Institute
933 Plum Grove Road
Schaumburg, IL 60195
- DHI Door and Hardware Institute
14150 Newbrook Drive, Suite 200
Chantilly, VA 20151-2223
- EJMA Expansion Joint Manufacturers Association
25 North Broadway
Tarrytown, NY 10591
- FM Factory Mutual System
1301 Atwood Avenue
P.O. Box 7500
Johnston, RI 02919
- GANA Glass Association of North America
2945 SW Wanamaker Drive, Suite A

- Topeka, KS 66614
- ICC International Code Council
500 New Jersey Avenue, N.W., Sixth Floor
Washington, D.C. 20001
- IEEE Institute of Electrical and Electronics Engineers
3 Park Avenue, 17th Floor
New York, NY 10016
- IGMA Insulating Glass Manufacturers Alliance
1500 Bank Street, Suite 300
Ottawa, Ontario K1H 1B8
- ISO International Organization for Standardization
1, ch. de la Voie-Creuse
Case postale 56
CH-1211 Geneva 20, Switzerland
- MBMA Metal Building Manufacturer's Association
1300 Sumner Avenue
Cleveland, OH 44115
- MFMA-1 Metal Framing Manufacturers Association
401 N. Michigan Ave
Chicago, IL 60611
- ML/SFA Metal Lath/Steel Framing Association
600 S. Federal Street, Suite 400
Chicago, IL 60605
- NAAMM National Association of Architectural Metal Manufacturers
8000 Roosevelt Road
Bldg. C, Suite 312
Glen Ellyn, IL 60137
- NEBB National Environmental Balancing Bureau
8575 Grovemont Circle
Gaithersburg, MD 20877
- NFPA National Fire Protection Association
1 Battery March Park
Quincy, MA 02169
- NSWMA National Solid Wastes Management Association
4301 Connecticut Avenue, NW, Suite 300
Washington, DC 20008
- OSHA Occupational Health and Safety Administration
Washington Department of Labor and Industries
Division of Occupational Safety and Health
7273 Linderson Way SW
Tumwater, WA, 98501
- PCA Portland Cement Association
5420 Old Orchard Road

- Skokie, IL 60077
- PCI Prestressed Concrete Institute
200 W. Adams St. #2100
Chicago, IL 60606
- SDI Steel Deck Institute
P.O. Box 9506
Canton, OH 44711
- SJI Steel Joist Institute
Technology, Engineering & Education Center
196 Stonebridge Drive, Unit 1
Myrtle Beach, SC 29588
- SMACNA Sheet Metal and Air Conditioning Contractors' National Association
4201 Lafayette Center Drive
Chantilly, VA 20151
- SSPC Steel Structures Painting Council
40 24th Street, 6th Floor
Pittsburgh, PA 15222
- UL Underwriters Laboratories, Inc.
2600 N.W. Lake Road
Camas, WA 98607-8542

Part 2 Products

2.01 Not Used

Part 3 Execution

3.01 Not Used

**** END OF SECTION ****

SECTION 01 45 00 - QUALITY CONTROL

Part 1 General

1.01 Section Includes

- A. Quality Assurance and Control of Manufacturing
- B. Inspection and Testing Laboratory Services
- C. Manufacturers' Field Services and Reports

1.02 Quality Assurance and Control of Manufacturing

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply fully with manufacturer's instructions, including each step-in sequence.
- C. Should manufacturer's instructions conflict with Specifications, request clarification from the Owner and Engineer before proceeding.
- D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.
- F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.03 Inspection and Testing Laboratory Services

- A. Supplier, Manufacturer, and/or Contractor will employ services of an independent firm to perform inspection and testing as specified in these Specifications.
- B. The Independent Firm will perform inspections, sampling, tests, and other services as required by the Owner.
- C. Reports will be submitted by the independent firm to the Owner, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Specification.
- D. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, and assistance as requested.
 - 1. Notify Owner and independent firm 48 hours prior to expected time for services.
 - 2. Make arrangements with independent firm and pay for additional samples and tests required for Supplier, Manufacturer, and/or Contractor's use.

- E. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the Owner at no additional cost to the Owner.

1.04 Manufacturers' Field Service and Reports

- A. Submit qualifications of observer to Owner 10 days in advance of required observations. Observer subject to approval of the Owner.
- B. When specified in individual Specification sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, balance, or replacement of equipment as applicable, and to initiate instructions when necessary.
- C. The Supplier, Manufacturer, and/or Contractor shall report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- D. Submit report in duplicate within 10 days of observation to Owner for review.

1.05 Submittals

- A. Submit under provisions of Section 01 33 00 – Submittal Procedures.
- B. Submit name, address, and telephone number of independent firm to perform inspection and testing.
- C. On request, submit documentation verifying accuracy of test results.

Part 2 Products

2.01 Not Used

Part 3 Execution

3.01 Not Used

**** END OF SECTION ****

SECTION 01 60 00 - PRODUCT REQUIREMENTS

Part 1 General

1.01 Section Includes

- A. Products
- B. Delivery, Storage, and Handling
- C. Product Options
- D. Substitutions (approved alternates)

1.02 Products

- A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work. It does not include machinery and equipment used for preparation, fabrication, conveying, and erection of the Work.
- B. Products may include existing materials or components supplied and approved by the Owner, at the Owner's discretion.
- C. Provide interchangeable components of the same manufacturer, for similar components.

1.03 Delivery, Storage, and Handling

A. General

1. All equipment shall be adequately prepared for shipment and for outdoor storage.
2. Prior to shipment, equipment shall be completely drained and thoroughly dried. When such drainage requires the removal of plugs, drain valves, etc., Supplier, Manufacturer, and/or Contractor shall be responsible that these parts are reinstalled or reassembled prior to shipment.
3. All openings and machined surfaces shall be provided with protection to prevent damage, corrosion, and entrance of foreign matter during shipment and storage.
4. Flanged connections shall be protected by a 1/2-inch or thicker plywood disc, or suitable alternate, bolted to the face of the flange.
5. Threaded or socket weld connections shall be protected with screwed or snap-in (snap-on) type, securely held, plastic protectors. Cast iron plugs are not acceptable for protection unless part of the permanent assembly.
6. Butt weld connections shall be protected by wooden disks that cover the entire weld end area, and are secured by metal straps and fasteners.
7. Covers, straps, or fasteners shall not be welded to equipment.

8. Equipment shall be adequately supported for shipment. All loose parts shall be crated or boxed for shipment and appropriately identified. Where shipment is braced internally, it shall be marked conspicuously "Remove internal braces before testing and operating."
9. To facilitate rapid installation, all equipment shall be shop assembled to the maximum extent practical before shipment to site.
10. All large and heavy shipping units shall have suitable skids for moving. Crating shall also be adequate for lifting with slings. If location of slings is critical, these locations shall be marked accordingly. Lifting lugs, if required, shall be provided and installed by Supplier, Manufacturer, and/or Contractor.

B. Site Handling and Storage of Materials and Equipment

1. Where required to protect against condensation and humidity, sufficient desiccant for the prescribed storage interval shall be provided by the Supplier, Manufacturer, and/or Contractor and its presence with the need of periodic removal, dry-out, or replacement shall be so marked. When electric space heaters are provided for that purpose, these shall be wired by the Supplier, Manufacturer, and/or Contractor such that energization immediately upon receipt is possible without disassembly of crates, etc. This also requires that no combustible material be left inside the equipment or crate.
2. Supplier, Manufacturer, and/or Contractor shall provide one (1) copy of storage and handling instructions to Purchaser, including descriptions for periodic inspection and/or storage maintenance to enable Purchaser to ascertain that no deterioration will occur during storage. One (1) set of these instructions shall also be fastened securely to the outside of each shipping unit to aide personnel in storage and handling.
3. All material and equipment shall be protected against loss; damage by corrosion, weather, overstressed components, or contamination by foreign materials, Supplier, Manufacturer, and/or Contractor shall repair or replace any material or equipment damage during delivery or installation at no cost to the Purchaser.

1.04 Product Options

- A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

1.05 Substitutions (Approved Alternatives)

- A. Substitutions may be considered at the option of the Owner.
- B. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

- C. A request constitutes a representation that the Supplier, Manufacturer, and/or Contractor:
1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
 2. Will provide the same warranty for the Substitution as for the specified product.
 3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
 4. Waives claims for additional costs or time extension which may subsequently become apparent.
- D. Substitution Submittal Procedure:
1. Submit four (4) copies of request for Substitution for consideration. Limit each request to one proposed Substitution.
 2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence.
 3. The Owner will notify Supplier, Manufacturer, and/or Contractor, in writing, of decision to accept or reject request.

Part 2 Products

2.01 Not Used

Part 3 Execution

3.01 Not Used

**** END OF SECTION ****

SECTION 01 77 00 - CLOSEOUT PROCEDURES

Part 1 General

1.01 Section Includes

- A. Closeout Procedures
- B. Final Cleaning
- C. Adjusting
- D. Project Record Documents
- E. Operation and Maintenance Data
- F. QA/QC Documentation Package
- G. Warranties
- H. Spare Parts and Maintenance Materials

1.02 Closeout Procedures

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Owner's inspection.
- B. Provide the Owner with submittals that are required by governing or other authorities.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

1.03 Final Cleaning

- A. Execute final cleaning prior to final inspection.
- B. Clean interior and exterior glass and surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces.
- C. Clean equipment and fixtures to a sanitary condition.
- D. Clean or replace filters of operating equipment.
- E. Clean debris from roofs, gutters, downspouts, and drainage systems.
- F. Clean site; sweep paved areas, rake clean landscaped surfaces.
- G. Remove waste and surplus materials, rubbish, and construction facilities from the site.

1.04 Adjusting

- A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

1.05 Project Record Documents

- A. Maintain on site, one set of the following record documents; record actual revisions to the Work:
 - 1. Contract Drawings
 - 2. Specifications
 - 3. Addenda
 - 4. Change Orders and other Modifications to the Contract
 - 5. Reviewed shop drawings, product data, and samples
- B. Store Record Documents separate from documents used for construction.
- C. Record information concurrent with construction progress.
- D. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
 - 1. Manufacturer's name and product model and number
 - 2. Product substitutions or alternates utilized
 - 3. Changes made by Addenda and Modifications
- E. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Measured depths of foundations.
 - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 4. Field changes of dimension and detail.
 - 5. Details not on original Contract Drawings.
- F. Provide monthly records, for the entire duration of the project, regarding the total amount of fuel used by on-site equipment.

1. Provide separate records for different types of fuels (gasoline, diesel, propane and bio-diesel).
 2. Identify the fuel amounts under two (2) separate categories:
 - a. Stationary equipment (pumps, generators, etc.)
 - b. Mobile equipment (excavators, dozers, trucks, etc.)
 3. Supplier, Manufacturer, and/or Contractors to fill out Owner provided NPRI-GHG reporting spreadsheet on a monthly basis.
 4. Data is to be recorded on Owner provided spreadsheet and submitted to the Owner within the first week of each successive month.
- G. Submit documents to Owner with claim for final Application for Payment.

1.06 Operations and Maintenance Data

- A. Prepare four sets prior to final inspection, bound in 8-1/2 x 11-inch text pages, three D side ring binders with durable plastic covers.
- B. Prepare binder covers with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS," title of project, and subject matter of binder when multiple binders are required.
- C. Part 1: Directory, listing names, addresses, and telephone numbers of Engineer, Supplier, Manufacturer, and/or Contractor, Subcontractors, and major equipment suppliers.
- D. Part 2: Project documents and certificates, including the following:
 1. Shop drawings and product data
 2. Instruction manuals for all equipment
 - a. The descriptions shall not be general or applicable to multiple types of sizes of Supplier, Manufacturer, and/or Contractor's equipment, but shall be project specific with references to equipment and drawings submitted by Supplier, Manufacturer, and/or Contractor.
 - b. Schematics, parts lists, and component location diagrams shall be included for all electronic circuitry and for all circuit boards. Parts list shall provide, where applicable, generic part numbers for components.
 - c. Each manual shall contain the following components as applicable:
 - 1) Cover
 - 2) Title Page

- 3) Table of Contents
- 4) List of Illustrations
- 5) List of Drawings and Tables
- 6) Equipment Description
- 7) Storage
- 8) Installation
- 9) Alignment and Calibration
- 10) Operation
- 11) Equipment Maintenance and Repair
- 12) Inactivation Procedures
- 13) Troubleshooting
- 14) Parts Lists
- 15) Special Tools and Instruments Lists

3. Air and water balance reports
4. Certificates
5. Photocopies of warranties and bonds

E. Submit one copy of completed volumes in final form 15 days prior to final inspection. This copy will be returned after final inspection, with Owner's comments. Revise and submit documents as required prior to final Application for Payment.

F. Submit final volumes revised, within ten days after final inspection.

1.07 QA/QC Documentation Package

- A. Prepare four sets prior to final inspection, bound in 8-1/2 x 11-inch text pages, three D side ring binders with durable plastic covers.
- B. Prepare binder covers with printed title "QA/QC DOCUMENTATION PACKAGE," title of project, and subject matter of binder when multiple binders are required.
- C. Part 1: Directory, listing names, addresses, and telephone numbers of Engineer, Supplier, Manufacturer, and/or Contractor, Subcontractors, and material suppliers.
- D. Part 2: Project documents and certificates, including the following:

1. The descriptions shall not be general or applicable to multiple types of materials, but shall be project specific with references to materials, equipment and drawings submitted by Supplier, Manufacturer, and/or Contractor.
2. Each manual shall contain the following components as applicable:
 - a. Cover
 - b. Title Page
 - c. Table of Contents
 - d. Workmanship Warranty
 - e. Material Warranty
 - f. Record Drawings (As built)
 - g. QA/QC Program Records
 - h. Mill Crest and Manufacturer Quality Certificate
 - i. Certificate of Analysis
 - j. Oven Aging and UV Aging Test Report
- E. Submit one copy of completed volumes in final form 15 days prior to final inspection. This copy will be returned after final inspection, with Owner's comments. Revise and submit documents as required prior to final Application for Payment.
- F. Submit final volumes revised, within ten days after final inspection.

1.08 Warranties

- A. Provide reproducible notarized copies.
- B. Submit prior to final Application for Payment.
- C. For items of Work delayed beyond date of Substantial Performance, provide updated submittal within ten (10) days after acceptance, listing date of acceptance as start of warranty period.

1.09 Spare Parts and Maintenance Materials

- A. General
 1. Provide a list of recommended on hand spare parts as per manufacturer's recommendations with current price of each. Include all spare parts considered necessary for first year of operation. These spare parts shall be in addition to those

specifically identified herein. In addition, supply all special tools necessary for installation, operation, and maintenance of the equipment furnished.

2. The list of recommended spare parts shall be accompanied by descriptions sufficiently detailed to identify the spare parts and the specific item or items to which it applies. Indicate the minimum recommended inventory for routine maintenance and installation, startup and continuous operation. Indicate whether the recommended spare is a stock item or special item, location of nearest supply point, approximate lead time required for shipment, and the part price.
 3. Spare parts shall be identical in design and manufacture and shall be interchangeable with the corresponding parts in the equipment supplied. Spare parts shall be carefully boxed and/or packed in waterproof packing for storage. Each box shall be properly marked or tagged and contain a list and identification numbers of the parts contained therein.
 4. The list of special tools shall be accompanied by descriptions sufficiently detailed to identify the function of the tool and the specific item or items for which it applies. Indicate whether the tool is required for installation, adjustment, or routine maintenance. If the tool is required, it shall be included in the Supplier, Manufacturer, and/or Contractor's scope of supply.
- B. Deliver to location directed by Owner; obtain receipt prior to final payment.

Part 2 Products

2.01 Not Used

Part 3 Execution

3.01 Not Used

**** END OF SECTION ****

SECTION 05 50 00 - METAL FABRICATIONS

Part 1 General

1.01 Section Includes

- A. Miscellaneous metalwork, including structural steel shapes, plates, and bars; steel ladders, grating, seat angles, and miscellaneous supports and guides.

1.02 References

- A. Detailing for Steel Construction, Second Edition, as issued by the AISC.
- B. Metal Framing Manufacturers Association Standard Publication MFMA-1.

1.03 Submittals

- A. Submit the following under the provision of Section 01 33 00 of these Specifications: Shop Drawings showing dimensions, details, and necessary accessory items.

1.04 Delivery, Storage, and Handling

- A. Fabricated metal shall be delivered on long-bed trucks or trailers adequately supported to prevent bending and other damage. Adequate preparations shall be made for unloading and handling prior to delivery of materials. Materials shall be unloaded by hand, by appropriate slings, or other means that will prevent damage. Materials shall be stored above ground in such a manner as to prevent rusting and bending, and shall be protected with waterproof covers.

Part 2 Products

2.01 General

- A. Materials for miscellaneous metalwork shall be as follows:

Material	Specification
Steel shapes, plates, bars, clips and similar items	ASTM A36
Steel pipe	ASTM A53, Type S, Grade B
Steel tubing	ASTM A500, Grade B
Stainless steel	ASTM A320, Type 304
Aluminum	ASTM B241, Alloy 6061-T6

2.02 Seat Angles, Miscellaneous Supports and Guides

- A. Seat angles and supports for grating, supports for floorplates, clips, plates and angles for precast wall panels, lintels and guides for slide gates shall be steel, of sizes shown, and shall be hot-dip galvanized after fabrication.

2.03 Metal Framing System for Pipe Supports, Anchors and Guides

- A. General: The bolted metal framing system shall be made of channel, fittings, and hardware as defined in the Metal Framing Manufacturers Association Standard Publication MFMA-1.
- B. Material and Finishes:
 - 1. Hot-Dip Galvanized After Fabrication: Channels Hot-Dipped Galvanized After Fabrication shall be made from steel meeting the minimum requirements of ASTM A570, Grade 33. Eighteen gauge and lighter channel shall be ASTM A611, Grade C steel. Channels shall be Hot-Dip Galvanized After Fabrication in accordance with ASTM A123. All 1/4-inch fittings shall be formed from ASTM A635 steel and Hot-Dip Galvanized After Fabrication in accordance with ASTM A123.
 - 2. Stainless Steel: Stainless Steel Channel and accessories shall be of AISI Type 304 or Type 316 Stainless Steel.
- C. Dimensions: Metal Framing Channel shall be cold formed 12 Ga., 14 Ga., or 16 Ga. steel. All channels shall have a nominal overall width of 1-5/8 inch and have a 7/8 inch slot face opening. All testing and tolerances shall be in accordance with the latest MFMA-1 Standard.
- D. Metal Framing System Components:
 - 1. Components shall be from a single manufacturer such as B-Line System, Inc., or Unistrut Corporation and include the following components:
 - a. Strut Channel – Model B22 or P1000
 - b. Combination Strut Channel – Model B52A or P4101
 - c. Pipe Clamp – Model B2400 or P2558
 - d. Adjustable Brace – Model B634 or P2815
 - e. Concrete Insert – Model B22I or P3253
 - f. End Cap – Model B205 and B287 or P1180 and P2280A
 - g. Spring Nut – Model N226 or P1009
 - h. Bolt – Model HHCS 3/8 x Size or HHCS037 x Size

2.04 Galvanizing

- A. Hot-Dip Galvanizing: Large structural steel items such as columns and beams shall be galvanized only if specifically shown on the Drawings. Galvanizing by the hot-dip process shall conform to the applicable requirements of ASTM A123, A153, A384, A385, and A386.

- B. Field Repair of Galvanizing: Field repair of galvanizing shall be done using Z.R.C. Cold Galvanizing Compound.

2.05 Bolts, Nuts and Washers

- A. Bolts shall physically conform to ASTM A193, Grade B8M. Bolt and nut dimensions shall conform to ANSI B18.2. Washer dimension shall conform to ANSI B27.2.
 - 1. Above ground nuts and bolts shall conform to ASTM A307 unless noted as stainless steel. Carbon steel bolts, nuts and washers shall be hot-dip galvanized after fabrication.
 - 2. All below ground bolts shall be stainless steel. Stainless steel bolts and accessories shall be Type 304 material. Bolts shall be Stainless steel, Grade B, heavy hex, in accordance with the requirements of Class C of ASTM A153. Nuts shall conform to the requirements of ASTM A563. Nuts shall be Grade A, heavy hex, hot dip zinc-coated in accordance with Class C of ASTM A153. Washers shall be Grade A, hot dip zinc-coated in accordance with Class C of ASTM A153.
 - 3. All thread is not allowed unless authorized by the Engineer.

2.06 Expansion Bolts

- A. Expansion bolts shall be wedge-type bolts, and shall be Molly Parabol Concrete Anchors. Expansion bolts shall be stainless steel. Components of stainless steel expansion bolts, including nuts, washers and wedges, shall be stainless steel. Minimum embedment lengths and edge distances shall be as recommended by the manufacturer, unless otherwise shown on the Drawings.

Part 3 Execution

3.01 General Requirements

- A. Measurements shall be verified at the Project site. Holes shall be punched 1/16-inch larger than the nominal size of the bolt, unless otherwise specified. No drifting of bolts or enlargement of holes will be allowed to correct misalignment.
- B. Dissimilar metals shall be protected from galvanic corrosion by means of pressure tapes, coatings or isolators.
- C. Metalwork to be embedded in concrete shall be placed accurately and held in position while the concrete is placed.
- D. Structural steel that is completely encased in concrete shall not be galvanized or painted and shall have a clean surface for bonding to concrete.

3.02 Fabrication

- A. Fabrication and workmanship shall be performed in accordance with the AISC Specification for Design, Fabrication, and Erection of Structural Steel for Buildings.

Fabrication, including cutting, drilling, punching, threading, and tapping required for miscellaneous metal or adjacent work shall be performed prior to hot-dip galvanizing.

3.03 Connections

- A. Welded: Welding shall be done by operators who have been qualified by tests as prescribed by the AWS in Standard Chylifaction Procedure to perform the type of work required. The quality of welding shall conform to AWS Structural Welding Code.
- B. Bolting: Bolts for structural and miscellaneous steel connections shall extend no further than twice the bolt diameter past the nut. Washers shall be installed at the nut on bolt assemblies. Stacking of nuts or washers on bolts will not be permitted. Bolted connection shall conform to AISC and shall be as shown on the Drawings.

3.04 Seat Angles, Supports and Guides

- A. Seat angles for grating and supports for floor plates shall be set so that the gratings and floor plates are supported evenly and maintain the grating and floor plates flush with the floor.

3.05 Grating

- A. Openings in concrete surfaces for gratings, floor and miscellaneous cover plates shall be field measured for proper cut-outs and proper size. Holes through gratings and cover plates shall be banded. Dimensions shall be field verified to ensure proper fit prior to ordering. Grating shall be attached to supports with a minimum of four hold-down clips per panel.

3.06 Cleaning

- A. After installation, damaged surfaces of shop primed metals shall be cleaned and touched-up with the same material used for the shop coat.

3.07 Repair and Galvanizing

- A. Damaged areas of galvanizing shall be cleaned with mineral spirits followed by wire brushing. After wire brushing, areas shall be cleaned with Z.R.C. metal conditioner and coated with Z.R.C. Cold Galvanizing Compound in accordance with the manufacturer's printed instructions and recommendations.

** END OF SECTION **

SECTION 43 10 00 – ENCLOSED LANDFILL GAS FLARE

Part 1 General

1.01 Section Includes

- A. A single vendor to furnish all labor, materials, equipment, and incidentals necessary for an enclosed landfill gas flare to be delivered to the project site.
- B. An enclosed flare designed and constructed to operate as a complete pre-assembled unit to minimize field installation and start-up time.
- C. Complete fabrication, assembly, pre-wiring, and testing (functional wiring check, simulated operation, proper operation of all safety system, etc.) prior to shipment.
- D. Complete system documentation for equipment, fabrication, operations and maintenance.
- E. System Components Include:
 - 1. Flame arrestor.
 - 2. Enclosed Flare.
 - 3. Instrumentation for temperature, pressure, flame scanner, etc.
 - 4. Piping, valves and appurtenances.
 - 5. Pilot fuel train.
- F. The vendor shall deliver the enclosed landfill gas flare to the project site located at 9411 NE 94th Avenue, Vancouver, WA 98662.
- G. All equipment shall be manufactured in accordance with codes and guidelines as specifically detailed herein and in accordance with applicable portions of the following (latest edition):
 - 1. Local laws and ordinances.
 - 2. State and Federal laws.
 - 3. National Electrical Manufacturers Association (NEMA)
 - 4. Underwriters Laboratories (UL).
 - 5. American National Standards Institute (ANSI).
 - 6. ASTM International (ASTM).
 - 7. American Society of Mechanical Engineers (ASME).

8. American Petroleum Institute (API).
9. Institute of Electrical and Electronic Engineers (IEEE).
10. Steel Structures Painting Council (SSPC).
11. Manufacturers Standardization Society (MSS).
12. Instrument Society of America (ISA).
13. Industrial Risk Insurance (IRI).
14. Factory Mutual (FM).
15. United States Environmental Protection Agency (USEPA).

1.02 System Description

- A. Provide a unitized, modular, enclosed landfill gas flare including all components necessary for a complete and operational system. The enclosed flare shall be capable of operating throughout the entire range of flow rate/methane content without any extra manipulation of equipment, instruments, and/or components (e.g., removal of burner tips, restrictions of louver openings, etc.).
- B. The landfill gas blower flare system shall be designed for the process media and site conditions listed in subsection 1.07 while operating on a sporadic, intermittent or continuous basis.
- C. When the flare instrumentation, controls, and devices are connected to the Owners supplied control panel and PLC logic, the user interface shall be capable of the following, in accordance with permit requirements.
 1. The PLC logic and flare louvers shall be capable of controlling and maintaining a constant temperature based on the selected set point.
 2. Thermocouple control selection to be “rolling” type to automatically select the proper thermocouple temperature based on the flow of LFG to the flare.
 3. The selected thermocouple is to be used as the temperature for the process variable (of the PID loop) for louver adjustments.
 4. A manual select switch will be provided in the Owner supplied panel, to alternate to each thermocouple as an alternative (intended for use during thermocouple failure and replacement periods).
 5. The thermocouples shall be capable of measuring and recording operational temperature at one (1) of three (3) or more thermocouples located on the flare stack,

- D. The enclosed landfill gas flare shall be capable of operating at the entire range of landfill gas flow rate from 9 to 90 scfm via staged burner nozzles in the single burner assembly (at 50 percent by volume methane).

1.03 Submittals

- A. Shop Drawings: Before any of the materials of the Section are delivered to the job site, the Supplier, Manufacturer, and/or Contractor shall submit complete shop drawings to the Engineer in accordance with the provisions of Section 01 33 00 of these Specifications. Shop drawings shall show all details of:
 - 1. Equipment dimensions, component parts and list of materials.
 - 2. All applicable equipment certifications (e.g., UL, FM, etc.).
 - 3. Descriptive literature, bulletins, and/or catalog information of equipment and instruments.
 - 4. Installation and mounting details.
 - 5. The total weight of the equipment, including the weight of the single largest item.
 - 6. Complete performance data that will indicate full compliance with the Specifications; performance curves for flow, methane, temperature, pressure capacity.
 - 7. Complete electrical interconnect diagram showing all wires and terminals between the control panel and external devices.
- B. Materials list: Submit four (4) copies of a complete list of all materials, instruments, and equipment proposed to be furnished and installed under this portion of the work, giving manufacturer's name, catalog number, and catalog cut for each item where applicable.
- C. Following installation, the Supplier, Manufacturer, and/or Contractor shall provide to the Engineer the equipment supplier's written report certifying that equipment:
 - 1. Has been properly installed and connected.
 - 2. Is in accurate alignment.
 - 3. Is free from undue stress imposed by piping or mounting bolts.
- D. Submit warranties as specified in accordance with subsection 1.09 of these specifications.
- E. Special arrangement: If proposed equipment requires an arrangement differing from that indicated on the drawings and as specified, prepare and submit for review detailed structural, mechanical, and electrical and process/instrumentation drawings and equipment lists, materials of construction and operating instructions, showing all necessary changes and all special features of proposed equipment. The Supplier,

- Manufacturer, and/or Contractor shall make such changes, if approved by the Engineer, at no additional cost to Owner.
- F. Exceptions to the applicable requirements, Drawings, Specifications, and applicable codes and standards.
 - G. Certification that the equipment furnished for this project does not exceed the sound pressure specified herein.
 - H. An operation and maintenance manual shall be furnished.
 - 1. Submit a minimum of four (4) physical copies and an electronic copy (Adobe PDF file [.pdf] or approved equivalent).
 - 2. The manual shall be prepared specifically for this project and shall include all required catalog cuts, drawings, specifications, equipment list, descriptions, definitions, procedures, and information necessary to instruct operating and maintenance personnel unfamiliar with such equipment.
 - 3. The manual shall include diagnostic table for identifying and correcting errors, malfunctions, and other problems that may occur during system operations. The manual shall include a list of spare parts, a list of suppliers, with phone numbers and contact info, for equipment parts that may need servicing or replacement.
 - I. Test Procedures: Detailed outline of functional test procedures shall include a step by step description of the proposed tests, a list of all test equipment including calibration dates, and signoff sheets.
 - J. Spare Parts: In addition to the spare parts recommended by this specification, a list of manufacturer's recommended spare parts shall be submitted for the blower and flare system.

1.04 Quality Assurance

- A. The Enclosed Landfill Gas Flare, including all ancillary equipment, shall be furnished by a manufacturer who is fully experienced, reputable, and qualified in the manufacture of the equipment to be furnished. The manufacturer shall have experience in supplying equipment for the landfill gas handling systems, and shall have a minimum of five (5) year's experience in design and manufacture of this type of equipment. The manufacturer shall have a minimum of ten (10) similar enclosed flares in successful operation in North America. Include manufacturers testing reports for a minimum of three (3) similar units with the qualifications submittals.
- B. The Enclosed Landfill Gas Flare shall be manufactured by Perennial Energy, Inc. of West Plains, Missouri, John Zink Company of Tulsa, Oklahoma, Parnel Biogas, Tulsa, Oklahoma, or approved equal.
- C. Qualifications of manufacturer: Products used in the work of this section shall be produced by manufacturers regularly engaged in the manufacture of landfill gas

handling, processing, and combustion systems and with a history of successful production acceptable to the Engineer.

- D. Basis of acceptance: The manufacturer's recommended installation procedures, when approved by the Engineer, will become the basis for inspecting and accepting or rejecting actual installation procedures used on this work.

1.05 Delivery, Storage, and Handling

- A. All parts shall be properly protected so that no damage or deterioration will occur during a prolonged delay from the time of shipment until installation is completed and the units and equipment are ready for operation.
- B. The equipment shall be delivered on site as fully assembled as transportation will allow. Factory-assembled parts and components shall not be dismantled for shipment unless permission is received in writing from the Engineer.
- C. Finished surfaces of all exposed openings shall be protected by wooden blanks, strongly built, and securely bolted thereto.
- D. Each box or package shall be properly marked to show its net weight in addition to its contents.

1.06 Equipment Certification

- A. All equipment included with the enclosed landfill gas flare, which is used in connection with landfill gas or propane, or is electrically-powered, must be certified under appropriate Underwriters Laboratories (UL) standards.

1.07 Site Conditions

- A. Operating conditions:

1. Ambient Conditions:

Condition	Value
Site Latitude	45.6868°
Site elevation, ft-msl	214
Climate	Short hot summers to mild wet winters
Ambient Dry Bulb Temperature, °F	21 to 91
Average Annual Rainfall, in	42

- 2. Process Media: 100 percent saturated landfill gas at up to 120 degrees Fahrenheit (°F).

3. Landfill Gas composition, (percent by volume):

Compound	Concentration (% vol)
Methane (CH ₄)	25 to 55
Carbon Dioxide (CO ₂)	25 to 45
Nitrogen (N ₂)	5 to 25

Compound	Concentration (% vol)
Water (H ₂ O, Vapor)	1 to 12
Oxygen (O ₂)	0 to 4
Argon (Ar)	0 to 1
Hydrogen (H)	less than 1
Trace Compounds	less than 1

Trace Compounds may contain hydrogen sulfide, carbon monoxide, sulfides, disulfides, mercaptans, and non-methane organic compounds. Typical non-methane organic compounds include: trichlorofluoromethane, trichloroethylene, benzene, vinyl chloride, toluene, perchloroethylene, methylene chloride, ethyl benzene, and dichloroethylene. Other compounds may be present.

1.08 Performance

- A. The enclosed landfill gas flare shall be capable of meeting or exceeding the following emission limits when operating under site conditions described above:
1. Gas flow rates: The flare system shall be capable of operating at a landfill gas flow rate and a landfill gas heat flow rate of 10 percent maximum load rating through 100 percent maximum load rating (10:1 Turndown ratio) described earlier in this section. The emission and destruction/reduction efficiencies and NO_x and CO levels shall remain in compliance with the specified emission limits set herein without the use of supplemental fuel.
 2. Gas Supply Pressure: The flare system shall require a maximum of 10 inches W.C. landfill gas pressure at the inlet of the flame arrester.
 3. Nitrous oxide (NO_x) emissions: Less than 0.06 lbs/MMBtu.
 4. Carbon monoxide emissions: Less than 0.15 lbs/MMBtu.
 5. Minimum 98 percent destruction removal efficiency (DRE) of non-methane organic compounds or less than 0.050 lb/MMBtu NMOC's as hexane at 3 percent by volume O₂.
- B. Visible Emissions:
1. The enclosed landfill gas flare shall be capable of operating with no visible emissions (0% opacity) except for periods not to exceed a total of five (5) minutes during any two (2) consecutive hours as determined using EPA Method 22.
 2. Visible emissions from the landfill gas flare shall not exceed zero percent opacity for more than three (3) minutes in any one (1) hour period as determined in accordance with the Southwest Clean Air Agency's (SWCAA's) Method 9 (see Appendix A of SWCAA 400).

1.09 Warranty and Guarantees

- A. Workmanship and Materials: The Supplier, Manufacturer, and/or Contractor shall warrant the enclosed flare and components being supplied to the Owner against defects in workmanship and material for a period of no less than one (1) year from the date of equipment acceptance by the Owner.
- B. Emission Limits: The Supplier, Manufacturer, and/or Contractor shall warrant the destruction efficiency, performance, and emission limits of the enclosed flare and components being supplied to the Owner for a period of no less than one (1) year from the date of acceptance by the Owner.
- C. In the event that the equipment fails to perform as specified, the equipment manufacturer shall promptly repair or replace the defective equipment without any cost to the Owner (including handling and shipment costs).

Part 2 Products

2.01 General

- A. Equipment shall not have been in service, except for shop tests, at any time prior to delivery. The equipment shall be furnished factory assembled to the extent possible and ready for installation.
- B. Equipment shall be designed and proportioned to have liberal strength, stability, and stiffness and shall be especially adapted for the intended service. Ample room and facilities shall be provided for inspection, operations, maintenance, repairs, and adjustments.
- C. Parts of equipment shall be amply proportioned for all stresses which may occur during operation and for any additional stresses which may occur during fabrication, transportation, handling, and erection.
- D. These Specifications are intended to give a general description of what is required, but do not cover all requirements of the equipment as offered. They are, however, intended to cover the furnishing and delivery of all materials, instruments, equipment, and apparatus as required. Auxiliary equipment necessary for proper operation of the Enclosed Landfill Gas Flare not mentioned in these Specifications or shown on the PLANS shall be furnished.
- E. At all levels of performance of the enclosed flare, the sound pressure shall not exceed 85 dbA over a frequency range of 37.8 to 9,600 cycles per second. Measurement shall be made a distance of 3 feet from the outer face of the equipment. The manufacturer shall certify that the equipment furnished for this project does not exceed the specified sound pressure. This written certification shall be submitted with the Shop Drawings.
- F. A brass or stainless steel nameplate shall be attached to each piece of equipment in a conspicuous place. The following information shall be plainly marked on the nameplate: name and address of the manufacturer, serial number, model number, date of manufacturer (month and year, at a minimum), and any other information necessary for complete identification.

- G. If necessary, modifications shall be made in the manufacturer's standard product to make it conform to the specific requirements of the Specifications and to requirements contained in regulations issued by public agencies. Such modifications shall be noted in Shop Drawing submittals.

2.02 Automatic Shutoff Valve

- A. An automatic shutoff valve shall be installed at the inlet to the flame arrestor. The automatic shutoff valve shall consist of a high performance butterfly valve with a 316 stainless steel disc and Viton resilient seat. The actuator shall be a pneumatically controlled with spring assist shutoff.

2.03 Flame Arrestor

- A. Flame arrestor shall be installed at the inlet to the flare. The pressure drop it imposes on the system is a maximum of 2 inches of water column (in.H₂O). The flame arrestor shall be constructed of cast aluminum housing with aluminum flame element. The flame element shall be removable for cleaning. The flame arrestor shall be eccentric design for mounting in the horizontal position. The piping and arrestor housing shall be fully supported when the arrestor element is removed for service. The flame arrestor shall have a temperature switch to shut down system upon high flame arrestor temperature resulting from flashback. The flame arrestor shall be provided with 1/2-inch FNPT sample port on the top of the housing on both sides of the element for pressure monitoring such that both flare back pressure and flare and flame arrestor back pressure can be monitored. The flame arrestor shall be provided with a 3/4-inch FNPT drain port on the bottom of the housing for draining condensate. Flame Arrestor shall be manufactured by Varec, Enardo, or Groth, and shall bear appropriate UL certification.

2.04 Enclosed Flare

- A. The enclosed landfill gas flare shall be a unitized, modular system including all components for a complete and operational system.
- B. The enclosed landfill gas flare shall be pre-piped and pre-wired to the extent possible, requiring minimal field assembly,
- C. The enclosed flare shall include, but not be limited to, the following components
 - 1. Flare stack: The flare stack shell shall be constructed of 1/4-inch minimum thickness ASTM A36 carbon steel, and shall be a minimum diameter and height sufficient to maintain the destruction efficiency performance requirements describe above. Sections of the flare cylinder shall be attached via continuous welds conforming to AWS D1.1 standards. The flare stack shall have the following properties and accessories.
 - a. Lifting lugs: Minimum two (2) lifting lugs shall be provided, each capable of carrying the entire weight of the unit.
 - b. Maximum internal temperature rating: 2,000 °F.

- c. Maximum external skin temperature: 250 ° F.
 - d. Concrete Pad Protection: Flare mounting shall be designed such that a minimum of 4 inches of passively ventilated air space is provided beneath the insulated flare floor and the concrete pad.
 - e. Insulation: Three (3) layers of ceramic fiber insulation blanket (maximum 2,300NF) shall be provided as combustion cylinder protection. Two (2) one inch layers of 8 lbs/ft³ blanket shall be installed, using overlap outer face construction methods, over one (1) 2-inch layer of 4 lbs/ft³ density material. Insulation shall be attached to the flare wall and floor with inconel 600 series studs and washers.
 - f. Insulation coating: High temperature, sprayed on surface sealer/protectant.
 - g. Manway: Min. 22-inch by 22-inch square door with hinges, insulated, and installed above burners.
 - h. View ports: Five (5) 2-inch NPT with removable tempered glass covers and cooling holes. Two (2) shall be located at the base of the flare to view the pilot flame and the base of the main flame. Each shall be located such that they offer a view of each thermocouple.
 - i. Thermocouple ports: Three (3), 2-inch NPT with bushing and cooling holes.
 - j. Source test ports:
 - 1) General: Conform to the requirements of 40 CFR Appendix A to Part 60, Method 1
 - 2) Minimum of four (4), 4-inch NPT with cooling holes.
 - 3) Installed at 90° intervals around the outer circumference and 1/2 stack diameter below the top of the flare stack. The port shall be cut flush with the interior diameter (ID) of the flare stack.
 - 4) Provisions shall be made for insertion of the emission test instrument probe without compromising the integrity of the ceramic fiber lining or the testing.
 - k. Main gas inlet nozzle: Stainless steel, raised faced slip on weld flange meeting the requirements of 150 # ANSI specifications, size is ANSI 6-inch.
 - l. Propane fueled pilot gas inlet nozzle: 1/2-inch NPT.
2. Burner: The burner unit shall have the following properties and accessories:
- a. Assembly: Multiple, small gas port, primary air mixed burner assembly consisting of a minimum of five (5) individual burners. The burner assembly shall be of the “primary air damper” type, designed to allow up to 60 percent

of the theoretical stoichiometric air required for combustion to be mixed with the landfill gas prior to ignition. The primary air dampers beneath each burner port shall be adjustable throughout their range from outside the flare cylinder, with the flare in full operation.

- b. Construction: 304L/316L Stainless Steel (less than 0.03 percent carbon content) with castable refractory venturi liners.
 - c. Burner Warranty: The Stainless Steel portions of the burner assembly shall be warranted by the manufacturer to perform for the purpose for which it is intended, to achieve emission limits as outlined in 1.08, and to be capable of maintaining compliant operation over the range of specified design pressures, flow rates and heat rates for a minimum period of two (2) years from date of delivery to site when operated continuously (greater than 85 percent Duty Cycle) within the specified design flow rate and heat loading limits.
 - d. Refractory: Removable, cast venturi burner lining assemblies, 2,700NF rating.
3. Thermocouples: Three (3) each, type K, housed in Inconel sheaths.
 4. Ultraviolet scanner: Honeywell or Engineer approved equivalent, Factory Mutual reviewed. Device shall be "self-checking" type. The ultraviolet scanner shall be compatible with the flame safeguard controller in the flare control panel.
 5. Propane pilot system: Removable pilot assembly rated at 40,000 Btu/hr, including pressure regulator, pressure indicator, solenoid valve, manual shutoff valve and pilot gas pressure manometer port.
 6. Total combustion and quenching air control: Motor operated, 12-gauge, galvanized steel damper(s) with 3/4-inch shaft at each inlet. 4-20 mA (DC) actuator damper motor(s) shall be utilized at the louver(s). Actuators shall cause louver(s) to fail open on loss of signal. Limit switches shall be provided on each louver actuator arm to confirm louver is closed during purge cycle. The louver and motor shall be mounted on a frame with hinges to allow the louver assembly to open as a door for access to the bottom of the burner assembly.
 7. Electronic spark ignition: 6,000 V and 20 mA electronic igniter assemblies, removable from outside of flare without disconnecting conduit or wiring. Spark ignition transformer shall be enclosed in a protective housing, meeting NEMA 4 criteria and shall receive the 120 V AC power and hi-tension conduits. Igniter shall be installed such that energy release at the point of ignition shall be adequate to reliably ignite the pilot gas burner.
 8. Flare anchor system: Flare mounting feet shall be provided such that appropriate anchorage can be provided using a HILTI HIT C-100 System using HFA or HAS inserts. Anchor bolt size, embedment depth, and location (spacing) with the flare foundation shall prevent overturn from wind load and seismic activities. Flare shall be designed to withstand loads and stresses per the requirements of UBC110 mph

wind loading and seismic zone 4 criteria (most current local seismic zone classification).

9. Finish: High temperature primer and finish coat over sand-blast prepared metal. Sand blasting shall be to SPC SP-6 guidelines.
10. Flare junction enclosure/main control panel: The flare mounted junction box(s) / panel(s) shall meet NEMA 4 criteria, and shall house all of the flare mounted electrical gear required to meet the operational requirements of this specification.
11. The flare shall include a purge blower assembly which shall be mounted near the base of the flare cylinder. This system shall also be provided with a “proof of purging” system to insure that the active purge cycle is completed prior to enabling the ignition sequence. A flow or pressure switch will be included with the purge blower to confirm purge blower operation.

2.05 Spare Parts

- A. The following spare parts shall be included with the enclosed landfill gas flare:
 1. Two (2) thermocouples.
 2. Ultraviolet scanner with focusing lens.
 3. Flame switch.
 4. Louver motor with arm crank and ball joint.
 5. Pilot ignitor, ignition transformer, and ignition cable.
 6. Propane solenoid valve and regulator.
 7. Solenoid valve for pneumatic actuator on auto shutoff valve.

2.06 Control Logic

- A. The enclosed landfill gas flare shall be capable of operating under the following typical control logic with control panel, PLC and programming provided by others.
- B. Sequence of Normal (Automatic Mode) Operation:
 1. With the PILOT, SHUTDOWN VALVE, and BLOWER mode switches in the “AUTO” position, turn the FLARE SYSTEM switch from “OFF” to “AUTO”.
 2. The limit switches on the automatic safety shutoff valve must indicate valve is in full-closed position prior to beginning system operation. The pilot and main thermocouples and UV scanner must not detect the presence of flame prior to beginning system operation. The thermal valve fusible link must not be broken.

3. The louvers shall automatically close. Upon limit switches confirming that the louvers have closed, the purge blower will be activated to purge the flare stack with ambient air for a specified time interval; time interval to be selected by Engineer based on internal volume of flare. Operation of the purge blower shall be confirmed via output from the purge blower pressure/flow switch.
4. Upon confirmation of purge blower operation and completion of the purge cycle, the pilot solenoid valve shall open and the spark igniter shall energize for up to 1 minute (adjustable) to ignite the pilot gas. If ignition (confirmed via UV scanner) does not occur within 60 seconds, the system shall shut down and annunciate an alarm.
5. After pilot ignition, and flame presence confirmation, a signal shall be sent to the open the automatic safety shutoff valve. Automatic safety shutoff valve open position shall be confirmed via open signal from limit switch.
6. Upon valve open confirmation, the active landfill gas blower shall start.
7. Landfill gas shall then be sent to the flare, and normal operation is achieved.
8. If flare fails to reach normal operating temperature within a specified time interval (adjustable), or experiences low temperature during normal operations for more than a specified time interval (adjustable), the temperature controller shuts down the unit and sends a signal to annunciate "Low Flare Temperature Shutdown".
9. If the flare exceeds the maximum temperature set-point, an over temperature signal shall shut down the unit and shall send a signal to annunciate "High Flare Temperature Shutdown".
10. If the main flame is extinguished for any reason, the system shall shut down and send a signal to annunciate "Flame Failure".
11. Should the landfill gas flow rate fall below an adjustable set point for nominally 30 seconds, the main control panel shall send a signal to the flare controls, the flare shall shut down and send a signal to annunciate "Flame Failure".
12. Should the inlet valve fail to open or close as required based upon control system logic or manual operator selection demand, the system shall shut down send a signal to annunciate "Inlet Valve Fail". This shut down shall require operator attention for repair and manual restart.
13. All blower flare system startup stages (as described in 1 through 6 above), automatic safety shutoff valve position and non-combustible gas composition (as described in 11 and 12 above) shall be confirmed through UL-certified burner controller, and shall not be confirmed by the Programmable Logic Controller (see Part 2.16.5 of this Section for PLC description). The burner controller shall cause a system shutdown (along with associated alarms) in the event that any stage of the system startup cannot be confirmed.

- C. The flare system may be operated in the “AUTO VACUUM”, “AUTO FLOW RATE”, or “AUTO TIMER” modes of operation. In the “AUTO TIMER” mode, the operator can select the “On Time-of-Day” and “Off Time-of-Day” inputs. These operational modes, as well as other control conditions and set-points are selectable on the “Touch Screen” operator interface device mounted on the front of the control panel.
- D. Safeties: The system shall be shut down under the following conditions as a minimum:
 - a. Burner controller shutdown/failure
 - b. Blower motor overcurrent
 - c. Blower motor undercurrent (surge)
 - d. Blower motor excessive vibration
 - e. Flame Failure
 - f. High Temperature at Flame Arrestor
 - g. High condensate level in Moisture Separator
 - h. Shutdown by Operator
 - i. Emergency Shutdown by Operator
 - j. Automatic Safety Shutoff Valve not fully opened or fully closed
 - k. Pilot Failure
- E. The LFG flow rate (in scfm), methane composition (in percent by volume), oxygen content (in percent by volume), and flare stack temperature (in degrees Fahrenheit) shall be measured and recorded on a continuous basis on an aggregated period of not less than every five (5) minutes.

Part 3 Execution

3.01 Permits

- A. Obtain all necessary certifications and permits.

3.02 Work by Others

- A. The Owner will engage the service of separate Contractor for the unloading of the flare and any shipped loose components. The Contractor will also setup and mount the flare to the concrete base in accordance with the flare manufacturer’s instructions.

3.03 Existing Conditions

- A. Inspection:

1. Prior to all work of this section, the Supplier, Manufacturer, and/or Contractor and the flare manufacturer representative in charge shall carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
 2. Verify that the work of this section may be installed in accordance with all pertinent codes and regulations, the original design, and the referenced standards.
- B. Discrepancies:
1. In the event of discrepancy, the Supplier, Manufacturer, and/or Contractor shall immediately notify the Engineer.
 2. The Supplier, Manufacturer, and/or Contractor shall not permit the manufacturer's representative in charge of system start-up to proceed with commissioning in areas of Discrepancy until such discrepancy has been resolved.

3.04 Installation

- A. General: Handling and installation the work of this section in strict accordance with the manufacturer's recommendations as approved by the Engineer.
- B. Installation shall proceed in compliance with the submitted installation schedule, as approved by the Engineer.
- C. All components shipped loose shall be installed by the Supplier, Manufacturer, and/or Contractor including any instrumentation, conduit/wiring, electrical devices, valves, actuators, piping, and flame arrestor.
- D. The work of this section shall be installed plumb and perpendicular to piping where required on Construction Drawings.
- E. Painting: Marred or abraded surfaces shall be cleaned and refinished in accordance with the manufacturer's recommendations.

3.05 Start-up and Testing

- A. Factory Test: The entire system, including all controls, shall be tested at the manufacturer's plant before shipment. Complete test reports shall be submitted to the Owner and Engineer to show all system controls operate correctly prior to shipment.
- B. Field Test: Provide onsite testing and training by a manufacturer's field technician/engineer.

3.06 Cleaning

- A. Clean exposed surface of all grease, dirt and other foreign materials.
- B. Touch up all marred or abraded surfaces as specified herein.

* * END OF SECTION * *

