REQUEST FOR PROPOSAL
No. JF180645P

OREGON STATE UNIVERSITY (OSU)
AUTOMATED PILOT BREWERY

PROPOSAL DUE DATE AND TIME

April 29, 2016 (3:00 PM, PT)

SUBMITTAL LOCATION

Oregon State University (OSU)
Procurement, Contracts and Materials Management
644 SW 13th Avenue
Corvallis, Oregon 97333

OSU Procurement, Contracts and Materials Management Offices are open Monday through Friday 8:00 am-12:00 noon and 1:00 pm-5:00 pm. Offices are closed during the 12:00 noon-1:00 pm lunch hour.

ELECTRONIC SUBMITTAL ADDRESS

bids@oregonstate.edu

(Updated: December 4, 2014)

1.0 GENERAL

1.01 SCHEDULE OF EVENTS

- Issue Date ..... March 18, 2016
- Deadline for Requests for Clarification or Change ..... April 8, 2016 (4:00 pm, PT)
- Proposal Due Date and Time ..... April 29, 2016 (3:00 pm, PT)

This Schedule of Events is subject to change. Any changes will be made through the issuance of Written Addenda.

1.02 PRE-PROPOSAL CONFERENCE

A Pre-Proposal Conference will not be held. Proposers who wish to view the site may schedule an appointment through the Administrative Contact list below.

1.03 ISSUING OFFICE

The Procurement, Contracts and Materials Management (PCMM) department of Oregon State University ("OSU") is the issuing office and is the sole point of contact for this Request for Proposal. Address all concerns or questions regarding this Request for Proposal to the Administrative Contact identified below.

1.04 ADMINISTRATIVE CONTACT

Name: James Figgins
Title: Purchasing Analyst III
Telephone: 541-737-6995
Fax: 541-737-2170
E-Mail: James.figgins@oregonstate.edu

1.05 DEFINITIONS

As used in this Request for Proposal, the terms set forth below are defined as follows:

a. "Addenda" means an addition to, deletion from, a material change in, or general interest explanation of the Request for Proposal.
b. "Exhibits" means those documents which are attached to and incorporated as part of the Request for Proposal.
c. "Proposal" means an offer, binding on the Proposer and submitted in response to a Request for Proposal.
d. "Proposer" means an entity that submits a Proposal in response to a Request for Proposal.
e. "Proposal Due Date and Time" means the date and time specified in the Request for Proposal as the deadline for submitting Proposals.
f. "Request for Proposal" (RFP) means a Solicitation Document to obtain Written, competitive Proposals to be used as a basis for making an acquisition or entering into a Contract when price will not necessarily be the predominant award criteria.
g. "Responsible" means an entity that demonstrates their ability to perform satisfactorily under a Contract by meeting the applicable standards of responsibility outlined in OSU Standard 580-061-0130.
h. "Responsive" means a Proposal that has substantially complied in all material respects with the criteria outlined in the Request for Proposal.
i. "Written or Writing" means letters, characters, and symbols that are intended to represent or convey particular ideas or meanings and are made in electronic form or inscribed on paper by hand, print, type, or other method of impression.

2.0 INTRODUCTION AND BACKGROUND

2.01 INTRODUCTION

Procurement, Contracts and Materials Management is seeking Responsive Responsible Proposers to submit Proposals for a Fully Automated Pilot Research Brewery.

2.02 BACKGROUND

The Department of Food Science and Technology at Oregon State University is one of the nation's oldest established programs. With world-class faculty, research and facilities, we prepare students to be industry leaders. The Fermentation Science program, one of just a handful in the nation, is a "hands-on" applied science addressing the use of microorganisms as processing agents in the production of wine and beer, as well as a variety of other fermented foods such as cheese, yogurt, soy sauce, pickles, breads and fermented vegetables. The equipment supplied from this solicitation will provide new opportunities utilizing the latest technologies for OSU students in the brewing industry.

2.03 OREGON STATE UNIVERSITY

Founded in 1868, Oregon State University is a comprehensive, research-extensive, public university located in Corvallis. OSU is one of only two American universities to hold the Land Grant, Sea Grant, Space Grant and Sun Grant designations. OSU is also the only Oregon institution to hold the Carnegie Foundation's top ranking for research universities, a recognition of the depth and quality of OSU's graduate education and research programs.

Through its centers, institutes, Extension offices and Experiment Stations, OSU has a presence in almost every one of Oregon's 36 counties, including its main campus in Corvallis, the Hatfield Marine Sciences Center in Newport and OSU-Cascades Campus in Bend. OSU offers undergraduate, masters and doctoral degrees through 12 academic colleges enrolling more than 26,000 students from every county in Oregon, every state in the country and more than 90 nations.

3.0 STATEMENT OF WORK

3.01 SAMPLE CONTRACT

A sample contract containing the Desired Specifications (Attachment A) and contractual terms and conditions is included at Exhibit A.

4.0 PROPOSER QUALIFICATIONS

4.01 MINIMUM QUALIFICATIONS

In order to qualify as a Responsive Proposer, the Proposer needs to meet the minimum qualifications below.

a. Proposer must have a minimum of ten (10) years' experience providing brewery equipment.
b. Must have previously supplied a fully automated research brewery.

4.02 PREFERRED QUALIFICATIONS

OSU will award additional points for Proposers able to meet the preferred qualifications below.

a. Proposer has a proven history providing similar brewery equipment to educational institutions.
b. Proposer has demonstrated experience implementing Siemens hardware for control and automation in the brewery.

5.0 REQUIRED SUBMITTALS

5.01 QUANTITY OF PROPOSALS

Submit one (1) electronic or hard copy via any of the methods detailed in the section below titled SUBMISSION. If submitting via hard copy, include one (1) electronic copy (PDF format) of Proposal on CD/DVD/flash drive. Proposals should contain original signatures on any pages where a signature is required (in the case of electronic submissions, either electronic signatures or scans of hand-signed pages should be included). Proposals should contain the submittals listed in this section below.

5.02 REQUIRED SUBMITTALS

It is the Proposer's sole responsibility to submit information in fulfillment of the requirements of this Request for Proposal. If submittals are not substantially compliant in all material respects with the criteria outlined in the RFP, it will cause the Proposal to be deemed non-Responsive.

REQUIRED SUBMITTALS	CHECKLIST
Description of how the goods or services offered specifically satisfy the statement of work described in section 3. At a minimum, The Proposer should provide: • Detailed information demonstrating the proposed solution meets the desired specifications listed in Attachment A of Exhibit A. • Provide literature and drawings detailing the proposed equipment. Information must be sufficient to allow OSU the ability to clearly understand proposed solution. • Provide delivery timeline, installation requirements and, if applicable, assumed responsibilities that OSU must provide.	☐
Detailed information about how the Proposer meets the minimum and preferred qualifications described in section 4. At a minimum, the Proposer should provide: • Brief company history showing a minimum of 10 years' experience in providing brewery equipment. • Provide brief listing of research breweries previously supplied. • If applicable, provide list of brewery equipment provided to educational institutions. • If applicable, provide detailed experience utilizing Siemens hardware.	☐
Exhibit B: Certifications, **fully completed and signed**.	☐
Exhibit C: References	☐
Exhibit D: Pricing, provide supplied spreadsheet. If necessary, provide additional itemized explanations and support for pricing provided on separate sheets.	☐
Exhibit E: Specifications Compliance Summary. Complete document clearly demonstrating what the proposed solution can meet. Provide additional sheets, if necessary, clearly explaining your proposed solution.	☐

6.0 EVALUATION

6.01 EVALUATION

The stages of review and evaluation are as follows:

a. Determination of Responsiveness:
OSU will first review all Proposals to determine Responsiveness. Proposals that do not comply with the instructions, that are materially incomplete, that do not meet the minimum requirements, or that are submitted by Proposers who does not meet minimum qualifications may be deemed non-Responsive. Written notice will be sent to Proposers whose Proposal is deemed non-Responsive identifying the reason. A Proposer has the right to appeal the decision pursuant to OSU Standard 580-061-130(5).

b. First Stage Evaluation:
Those Proposals determined to be Responsive will be evaluated using the required submittals. Proposals will be scored based on the evaluation criteria listed below. Scores will be used to determine

Proposers within a competitive range. The competitive range will be made of Proposers whose individual scores, when viewed together, form a group of the highest ranked Proposers above a natural break in the scores.

OSU reserves the right to ask follow-up questions of Proposers during first stage evaluations. The questions will be for the purpose of clarification of information already contained in submittals and not be an opportunity to submit additional documentation or change existing documentation.

OSU may award after the first stage evaluation to the highest ranked Proposer without moving on to the second stage evaluation. If this option is selected, Written notice of intent to award the Contract to the highest ranked Proposer will be provided to all Responsive Proposers, or an award may be made directly without notice of intent in those instances of a single Responsive Proposer.

c. Second Stage Evaluation:
If award is not made after the first stage evaluation, OSU may choose any of the following methods in which to proceed:

i. Issue a Written invitation to Proposers within the competitive range requesting an interview, presentation, site visit or any other evaluative method that is relevant to the goods or services solicited in the Request for Proposal. Written invitations will contain the evaluation criteria and scoring that will be used by the evaluation committee.

ii. Engage in oral or Written discussions with and receive best and final Proposals from all Proposers in the Competitive Range or all Proposers submitting Responsive Proposals. Discussions may be conducted for the following purposes:
- Informing Proposers of deficiencies in their initial Proposals;
- Notifying Proposers of parts of their Proposals for which OSU would like additional information; or
- Otherwise allowing Proposers to develop revised Proposals that will allow OSU to obtain the best Proposal based on the requirements set forth in this Request for Proposal.

The conditions, terms, or price of the Proposal may be altered or otherwise changed during the course of the discussions provided the changes are within the scope of the Request for Proposal. Best and final Proposals will be scored based on the evaluation criteria listed below.

Points awarded in the first stage evaluation will not be carried to the second stage evaluation. If a second stage evaluation of all Proposers does not produce an award that is in OSU's best interest, OSU may return to the first stage evaluation to advance additional Proposers to a second stage evaluation.

d. Additional Stages of Evaluation:
If after completion of the second stage of evaluation, an award is not made, OSU may add another stage of evaluation using any of the methods outlined in the second stage evaluation above.

6.02 EVALUATION CRITERIA

Points will be given in each criteria and a total score will be determined. The maximum points available for each criterion are identified below.

Evaluation Criteria	Points
Proposal relative to the Statement of Work (Attachment A of Exhibit A) This scoring will include the analysis of Exhibit E, "Specifications Compliance Summary"	60
Proposer's qualifications relative to minimum and preferred Qualifications (Section 4)	10
Price of the goods or services (Exhibit D)	30
Total	**100**

Pricing Calculation:
The Proposal that contains the lowest price to OSU will receive the maximum number of price points. A Proposal whose price is higher than the lowest submitted price will receive proportionately fewer price points, as demonstrated in the example below.

Proposer A's price is $450 (the lowest)
Proposer A is awarded 30 price points (the maximum)

Proposer B's price is $500
Proposer B is awarded 27 price points (450/500 x 30)

In the event of a discrepancy between unit prices and extended (arithmetically calculated) prices, unit prices will prevail over extended prices.

6.03 NEGOTIATIONS
OSU may commence serial negotiations with the highest ranked Proposer or commence simultaneous negotiations with all Responsive Proposers within the competitive range. OSU may negotiate:

a. The statement of Work;
b. The Contract price as it is affected by negotiating the statement of Work; and
c. Any other terms and conditions as determined by OSU.

6.04 INVESTIGATION OF REFERENCES
OSU reserves the right to investigate and to consider the references and the past performance of any Proposer with respect to such things as its performance or provision of similar goods or services, compliance with specifications and contractual obligations, and its lawful payment of suppliers, subcontractors, and workers. OSU may postpone the award or execution of the Contract after the announcement of the notice of intent to award in order to complete its investigation.

6.03 CONTRACT AWARD
Contract will be awarded to the Proposer who, in OSU's opinion, meets the requirements and qualifications of the RFP and whose Proposal is in the best interest of OSU. If a successful Contract cannot be completed after award, OSU may conclude contract negotiations, rescind its award to that Proposer, and return to the most recent RFP evaluation stage to negotiate with another Proposer(s) for award.

7.0 INSTRUCTIONS TO PROPOSERS

7.01 APPLICABLE STATUTES AND RULES
This Request for Proposal is subject to the applicable provisions and requirements of the Oregon Revised Statutes, Oregon Administrative Rules, and OSU Policies and Procedures.

7.02 COMMUNICATIONS DURING RFP PROCESS
In order to ensure a fair and competitive environment, direct communication between OSU employees other than the Administrative Contact or other PCMM representative and any party in a position to create an unfair advantage to Proposer or disadvantage to other Proposers with respect to the RFP process or the award of a Contract is strictly prohibited. This restricted period of communication begins on the issue date of the solicitation and for Proposer(s) not selected for award ends with the conclusion of the protest period identified in OSU Standard 580-061-0145(3) and for Proposers(s) selected for award ends with the contract execution. This restriction does not apply to communications to other OSU employees during a Pre-Proposal conference or other situation where the Administrative Contact has expressly authorized direct communications with other staff. A Proposer who intentionally violates this requirement of the RFP process or otherwise deliberately or unintentionally benefits from such a violation by another party may have its Proposal rejected due to failing to comply with all prescribed solicitation procedures. The rules governing rejection of individual solicitation responses and potential appeals of such rejections are at OSU Standard 580-061-0130.

7.03 MANUFACTURER'S NAMES AND APPROVED EQUIVALENTS

Unless qualified by the provision "NO SUBSTITUTE" any manufacturers' names, trade name, brand names, information and/or catalogue numbers listed in a specification are for information and not intended to limit competition. Proposers may offer any brand for which they are an authorized representative, which meets or exceeds the specification for any item(s). If Proposals are based on equivalent products, indicate in the Proposal form the manufacturers' name and number. Proposers shall submit with their Proposal, sketches, and descriptive literature, and/or complete specifications. Reference to literature submitted with a previous Proposal will not satisfy this provision. Proposers shall also explain in detail the reason(s) why the proposed equivalent will meet the specifications and not be considered an exception thereto. Proposals that do not comply with these requirements are subject to rejection. Proposals lacking any written indication of intent to provide an alternate brand will be received and considered in complete compliance with the specification as listed in the RFP.

7.04 REQUESTS FOR CLARIFICATION OR CHANGE

Requests for clarification or change of the Request for Proposal must be in Writing and received by the Administrative Contact no later than the Deadline for Request for Clarification or Change as specified in the Schedule of Events. Such requests for clarification or change must include the reason for the Proposer's request. OSU will consider all timely requests and, if acceptable to OSU, amend the Request for Proposal by issuing an Addendum. Envelopes, e-mails or faxes containing requests must be clearly marked as a Request for Clarification or Change and include the RFP Number and Title.

7.05 ADDENDA

Only documents issued as Written Addenda by PCMM serve to change the Request for Proposal in any way. No other direction received by the Proposer, written or verbal, serves to change the Request for Proposal. Addenda will be publicized on the OSU procurement website. Proposers are advised to consult the OSU procurement website prior to submitting a Proposal in order to ensure that all relevant Addenda have been incorporated into the Proposal. Proposers are not required to submit Addenda with their Proposal. However, Proposers are responsible for obtaining and incorporating any changes made by Addenda into their Proposal. Failure to do so may make the Proposal non-Responsive, which in turn may cause the Proposal to be rejected.

7.06 PREPARATION AND SIGNATURE

All Required Submittals must be Written or prepared in ink and signed in ink by an authorized representative with authority to bind the Proposer. Signature certifies that the Proposer has read, fully understands, and agrees to be bound by the Request for Proposal and all Exhibits and Addenda to the Request for Proposal.

7.07 PUBLIC RECORD

Upon completion of the Request for Proposal process, information in all Proposals will become subject records under the Oregon Public Records Law. Only those items considered a "trade secret" under ORS 192.501(2), may be exempt from disclosure. If a Proposal contains what the Proposer considers a "trade secret" the Proposer must mark each sheet of information as such. Only bona fide trade secrets may be exempt and only if public interest does not require disclosure.

7.08 SUBMISSION

Proposals must be received in the PCMM office no later than the Proposal Due Date and Time; it is the Proposer's responsibility to ensure that the Proposal is received prior to the Proposal Due Date and Time indicated in this RFP, regardless of the method used to submit the Proposal. Proposals may be submitted via the following method(s):

1) Electronic copy in PDF format included as attachment(s) in an e-mail sent to **bids@oregonstate.edu**. The e-mail subject line should contain the RFP No. and RFP title. Only those Proposals received at this e-mail address by the Due Date and Time will be considered Responsive; do not e-mail a copy of the Proposal to any other e-mail address. Proposals submitted directly to the Administrative Contact e-mail address will NOT be considered Responsive. It is highly recommended that the Proposer confirms receipt of the email with the Administrative Contact noted above or by calling 541-737-4261. The

Administrative Contact may open the e-mail to confirm receipt but will NOT verify the integrity of the attachment(s), answer questions related to the content of the Proposal, or address the overall Responsiveness of the Proposal.

2) Hard copy in a sealed package or envelope dropped off in person or delivered to the submittal location listed on the Request for Proposal cover sheet. The package or envelope should be addressed to the Administrative Contact. It is highly recommended that the Proposer confirms receipt of the Proposal with the Administrative Contact prior to the Proposal Due Date and Time.

All Proposals, including those submitted through electronic methods (if allowed), must contain Written signatures indicating intent to be bound by the offer. If the Proposer submits multiple versions of the Proposal via different methods and does not explicitly direct OSU as to which version to use, OSU will determine which version of the Proposal will be used for evaluation.

7.09 MODIFICATION

Prior to submittal, Proposers should initial modifications or erasures in ink by the person signing the Proposal. After submittal but prior to the Proposal Due Date and Time, Proposals may be modified by submitting a Written notice indicating the modifications and a statement that the modification amends and supersedes the prior Proposal. After the Proposal Due Date and Time, Proposers may not modify their Proposal.

7.10 WITHDRAWALS

A Proposer may withdraw their Proposal by submitting a Written notice to the Administrative Contact identified in this Request for Proposal prior to the Proposal Due Date and Time. The Written notice must be on the Proposer's letterhead and signed by an authorized representative of the Proposer. The Proposer, or authorized representative of the Proposer, may also withdraw their Proposal in person prior to the Proposal Due Date and Time, upon presentation of appropriate identification and evidence of authority to withdraw the Proposal satisfactory to OSU.

7.11 LATE SUBMITTALS

Proposals and Written notices of modification or withdrawal must be received no later than the Proposal Due Date and Time (in the case of electronic submissions, the time/date stamp of the email received at the PCMM office must be no later than the Proposal Due Date and Time). OSU may not accept or consider late Proposals, modifications, or withdrawals except as permitted in OSU Standard 580-061-0120. Sole responsibility rests with the Proposer to ensure OSU's receipt of its Proposal prior to the Proposal Due Date and Time. OSU shall not be responsible for any delays or misdeliveries caused by common carriers or by transmission errors, malfunctions, or electronic delays. Any risks associated with physical delivery or electronic transmission of the Proposal are borne by the Proposer.

7.12 PROPOSAL OPENING

Proposals will be opened immediately following the Proposal Due Date and Time at the Submittal Location. Proposer may attend the Proposal opening. Only the names of the Proposers submitting Proposals will be announced. No other information regarding the content of the Proposals will be available.

7.13 PROPOSALS ARE OFFERS

The Proposal is the Proposer's offer to enter into a Contract pursuant to the terms and conditions specified in the Request for Proposal, its Exhibits, and Addenda. The offer is binding on the Proposer for one hundred twenty (120) days. OSU's award of the Contract constitutes acceptance of the offer and binds the Proposer. The Proposal must be a complete offer and fully Responsive to the Request for Proposal.

7.14 CONTINGENT PROPOSALS

Proposer shall not make its Proposal contingent upon OSU's acceptance of specifications or contract terms that conflict with or are in addition to those in the Request for Proposal, its Exhibits, or Addenda.

7.15 RIGHT TO REJECT

OSU may reject, in whole or in part, any Proposal not in compliance with the Request for Proposal, Exhibits, or

Addenda, if upon OSU's Written finding that it is in the public interest to do so. OSU may reject all Proposals for good cause, if upon OSU's Written finding that it is in the public interest to do so. Notification of rejection of all Proposals, along with the good cause justification and finding of public interest, will be sent to all who submitted a Proposal.

7.16 AWARDS

OSU reserves the right to make award(s) by individual item, group of items, all or none, or any combination thereof. OSU reserves the right to delete any item from the award when deemed to be in the best interest of OSU.

7.17 LEGAL REVIEW

Prior to execution of any Contract resulting from this Request for Proposal, the Contract may be reviewed by a qualified attorney for OSU pursuant to the applicable Oregon State University Standards, Oregon Revised Statutes and Oregon Administrative Rules. Legal review may result in changes to the terms and conditions specified in the Request for Proposal, Exhibits, and Addenda.

7.18 PROPOSAL RESULTS

A Written notice of intent to award will be issued to all Proposers. The Proposal file will be available for Proposer's review during the protest period at the PCMM Department. Proposers must make an appointment with the Administrative Contact to view the Proposal file. After the protest period, the file will be available by making a Public Records Request to OSU Office of General Counsel.

7.19 PROPOSAL PREPARATION COST

OSU is not liable for costs incurred by the Proposer during the Request for Proposal process.

7.20 PROPOSAL CANCELLATION

If a Request for Proposal is cancelled prior to the Proposal Due Date and Time, all Proposals that may have already been received will be returned to the Proposers. If a Request for Proposal is cancelled after the Proposal Due Date and Time or all Proposals are rejected, the Proposals received will be retained and become part of OSU's permanent Proposal file.

7.21 PROTEST OF CONTRACTOR SELECTION, CONTRACT AWARD

Any Proposer who feels adversely affected or aggrieved may submit a protest within three (3) business days after OSU issues a notice of intent to award a Contract. The protest must be clearly identified as a protest, identify the type and nature of the protest, and include the Request for Proposal number and title. The rules governing protests are at OSU Standard 580-061-0145.

EXHIBIT A
SAMPLE CONTRACT AND TERMS AND CONDITIONS

This Contract is between Oregon State University for its Food Science & Technology ("OSU"), and [Contractor's name] ("Contractor").

WHEREAS, OSU competitively solicited for the goods outlined in this Contract under Request for Proposal number JF180645P entitled "Oregon State University (OSU) Automated Pilot Brewery" and Contractor was selected as the Proposer best able to provide these goods; and

WHEREAS, Contractor understands the requirements for the goods outlined in this Contract, and is willing and able to provide, in accordance with the terms of this Contract, the goods;

NOW, THEREFORE, OSU and Contractor agree as follows:

1. CONTRACT TERM AND TERMINATION:

A. CONTRACT TERM.
This Contract is effective on the date of last signature and expires on the date Contractor has delivered all goods in accordance with the requirements of this Contract and the goods have been accepted by OSU. All manufacturer warranties pass through to OSU.

B. TERMINATION.
This Contract may be terminated at any time by mutual consent of both parties or by OSU upon thirty (30) days' written notice. In addition, OSU may terminate this Contract at any time by written notice to Contractor if (a) Federal or state statutes, regulations or guidelines are modified or interpreted in such a way that the services are no longer allowable or appropriate for purchase under this Contract; (b) any license or certificate required by law or regulation to be held by the Contractor to provide the services required by this Contract is for any reason denied, revoked, or not renewed; or (c) OSU fails to receive funding, appropriations, allocations or other expenditure authority as contemplated by OSU's budget and OSU determines, in its assessment and ranking of the policy objectives explicit or implicit in OSU's budget, that it is necessary to terminate the Contract, or (d) if the OSU program for which this Contract was executed is abolished.

OSU may also terminate this Contract at any time by written notice for default (including breach of contract) if (a) Contractor fails to timely provide services or materials called for by this Contract; or (b) Contractor fails to perform any of the other provisions of this Contract, or so fails to pursue the work as to endanger performance of this Contract in accordance with its terms and conditions, and after receipt of written notice from OSU, fails to correct such failures within ten (10) days. Termination of this Contract under this Section or any other section is without prejudice to OSU's other rights and remedies.

C. REMEDIES FOR CONTRACTOR'S DEFAULT.
In the event Contractor is in default (which includes without limitation, incomplete services), OSU may, at its option, pursue any or all of the remedies available to it under this Contract and at law or in equity, including, but not limited to: (a) rejection

of the services, (b) requiring Contractor to correct any defects without charge, (c) negotiation with Contractor to sell the services to OSU at a reduced price, (d) termination of the Contract, (e) withholding all moneys due for the services Contractor has failed to deliver within any scheduled completion dates or has performed inadequately or defectively, (f) initiation of an action or proceedings for damages, specific performance, or declaratory or injunctive relief, or (g) exercise of its right of set off. These remedies are cumulative to the extent the remedies are not inconsistent, and OSU may pursue any remedy or remedies singly, collectively, successively, or in any order whatsoever.

2. REQUIRED GOODS, SERVICES, PRICING AND DELIVERY SCHEDULE.

Contractor shall deliver to OSU the following goods for the prices specified in this section.

A. GOODS AND SERVICES.
As listed in Attachment A.

B. SERVICES INCIDENTAL TO GOODS.
a. TRAINING: Contractor shall train to OSU's satisfaction the individuals identified by OSU in the operation, adjustment, repair and maintenance of goods delivered under this Contract. Commissioning of the goods is required.
b. PRICING:
As shown in Attachment B

C. DELIVERY.
Contractor shall deliver goods F.O.B. Destination, Prepaid and Allowed. Responsibility and liability for loss or damage remain with the Contractor until final inspection and acceptance, when responsibility passes to OSU except as to latent defects, fraud and Contractor's warranty obligations.

Delivery shall be made to:
Department of Food Science and Technology
Oregon State University
3051 SW Campus Way
Corvallis, Oregon 97331

D. NECESSARY COMPONENTS.
Unless specified otherwise, Contractor shall include all components, hardware and parts necessary for complete and proper assembly, installation and operation of goods.

E. NEW AND UNUSED GOODS.
Unless specified otherwise, Contractor shall deliver goods that are new, unused and produced from current production inventory. Contractor shall provide goods manufactured from only those components that the manufacturer offers in the manufacturer's current parts catalog for goods and carry full manufacturer warranties.

F. WARRANTIES.
Contractor warrants all goods delivered to be free from defects in labor, material, and manufacture and to be in compliance with specifications in the Solicitation Document. All implied or expressed warranty provisions of the Uniform Commercial

Code, at ORS Chapter 72, are incorporated into this Contract. All warranties run to OSU.

G. NON-COMPLIANCE.
If any goods or component parts are recalled by a regulatory body or the manufacturer, or discovered by Contractor not to comply with applicable regulatory standards or the Specifications, Contractor shall immediately notify OSU of the recall or non-compliance, and shall provide copies of the recall notice or notice of non-compliance, as applicable, and all other supporting documentation for the recall or non-compliance determination. OSU may elect to (a) reject goods in whole or in part, or (b) revoke its acceptance of goods in whole or in part. If OSU rejects goods or revokes its acceptance of goods, Contractor shall remove the particular goods from OSU's possession at no cost to OSU and shall reimburse OSU for all payments made for those goods.

3. COMPENSATION:

A. INVOICES AND PAYMENT TO CONTRACTOR.
Contractor shall send invoices to OSU for goods and services delivered and accepted by OSU. Contractor shall include in each invoice:

a. The Contract number or Purchase Order number;
b. The quantity of goods ordered, the quantity of goods delivered, the date goods were delivered, and the price per unit;
c. A description of services performed, the dates services were performed, all deliverables delivered during the period of the invoices, the rate(s) for services performed, and the total cost of services;
d. The total amount due and the payment remittance address.

Contractor shall send all invoices to OSU's Department Administrator or to the Department to which the services were provided if a Department Administrator is not specified.

OSU shall pay Contractor for services performed at the prices and rates specified herein. Contractor shall look solely to OSU for payment of all amounts OSU owes to Contractor. Payment of OSU contracts is normally made within 30-45 days following the date the invoice is received. After 45 days, Contractor may assess overdue account charges up to a maximum of two-thirds of one percent (2/3 of 1%) per month or eight percent (8%) per annum on the outstanding balance pursuant to ORS 293.462.

4. INSURANCE:

A. GENERAL LIABILITY INSURANCE.
Contractor shall obtain, at Contractor's expense, and keep in effect during the term of this Contract, Commercial General Liability Insurance, including Products and Completed Operations coverage, with minimum limits of $2 Million per occurrence and $4 Million aggregate. Such insurance policy is to be issued by an insurance company authorized to do business in the State of Oregon with an A.M. Best rating of at least A-VII, or such other insurance carrier approved in writing, in advance, by OSU. OSU and its officers, board members, employees, and agents shall be

included as additional insured in said insurance policy.

B. AUTOMOBILE LIABILITY INSURANCE.
Contractor shall obtain, at Contractor's expense, and keep in effect during the term of this contract, Automobile Liability Insurance. This coverage can be provided by combining the Automobile Liability Insurance with the General Liability Insurance. Coverage limits shall not be less than $2,000,000 combined single limit per occurrence.

C. PROPERTY INSURANCE.
The Contractor must maintain Property Insurance during the term of the Contract that covers all property used for Contract work and all Contractor-owned property that is stored at OSU.

D. PRIMARY COVERAGE.
Insurance carried by Contractor under this Contract shall be the primary coverage and OSU's insurance is excess and solely for damages or losses for which OSU is responsible.

E. WORKERS' COMPENSATION.
The Contractor, its subcontractors, if any, and all employers providing work, labor or materials under this Contract are subject employers under the Oregon Workers' Compensation law and shall comply with ORS 656.017, which requires them to provide workers' compensation coverage that satisfies Oregon law for all their subject workers, unless such employees are exempt under ORS 656.126.

F. CERTIFICATES OF INSURANCE.
As evidence of the insurance coverages required by this Contract, the Contractor shall furnish Certificate(s) of Insurance to the OSU Contract Administrator, upon request. The Certificate(s) will specify all of the parties who are Additional Insureds (or Loss Payees). Insurance coverages required under this Contract shall be obtained from acceptable insurance companies or entities. Contractor shall be financially responsible for all deductibles, self-insured retentions and/or self-insurance included hereunder.

G. NOTICE OF CANCELLATION OR CHANGE.
Each insurance policy required by the insurance provisions of this Contract shall provide the required coverage and shall not be suspended, voided or canceled except after thirty (30) days prior written notice has been given to OSU, except when cancellation is for non-payment of premium, then ten (10) days prior notice may be given. Such notice shall be sent directly to OSU. If any insurance company refuses to provide the required notice, the Contractor or its insurance broker shall notify OSU of any cancellation, suspension, non-renewal of any insurance within seven (7) days of receipt of insurers' notification to that effect.

5. INDEMNIFICATION:

A. INDEMNITY.
a. Contractor shall indemnify and hold harmless OSU and its officers, board members, employees, agents and other representatives against claims, expenses, or losses: (i) that result from Contractor's negligence, wrongful acts or

willful misconduct, or (ii) alleging Contractor's services, information or materials supplied by Contactor to OSU under this Contract, or OSU's use of any of the foregoing infringes on any patent, copyright, trade secret, trademark, or other proprietary right of a third party.

b. OSU's right to receive indemnification under this Section is conditioned upon OSU giving reasonably prompt notice and assistance of any claim; provided however, that OSU's failure to provide notice and assistance does not limit OSU's right to indemnification except to the extent such failure or assistance materially affects Contractor's ability to defend the claim.

c. Contractor's indemnification obligation under this Section includes but is not limited to all of OSU's expenses of litigation, court costs and reasonable attorney fees.

B. DEFENSE.
   a. Contractor shall have control of the defense with counsel reasonably acceptable to OSU, except that: (i) OSU may join the defense with its own counsel and at its own expense if OSU determines there is a conflict of interest or there is an important government principle at issue, and (ii) OSU'S consent is required for any settlement that requires OSU to pay any money, does not release OSU from all liability from the claim, or adversely affects OSU's interest.

6. LAWS AND POLICIES:

A. APPLICABLE LAW; JURISDICTION AND VENUE.
   a. The laws of the State of Oregon (without giving effect to its conflict of laws principles or laws) govern all matters arising out of or relating to the Contract, including, without limitation, its validity, interpretation, construction, performance or enforcement. Any party bringing a legal action or proceeding against the other party arising out of or relating to this Contract shall bring the legal action or proceeding in the Circuit Court of Oregon for Benton County.

   b. Notwithstanding paragraph (a), if a legal action or proceeding must be brought in a federal forum, the party shall bring the legal action or proceeding in the United States District Court for the District of Oregon. This paragraph does not authorize Contractor to bring a legal action or proceeding against OSU in a federal forum except to the extent Congress has validly abrogated OSU's sovereign immunity. This paragraph is also not a waiver by OSU of any form of immunity, including without limitation sovereign immunity and immunity based on the Eleventh Amendment to the United States Constitution.

   c. Except as set forth in paragraph (b), the parties consent to in personam jurisdiction in the above courts and waive any objection to venue and any objection that the forum is inconvenient.

B. COMPLIANCE WITH APPLICABLE LAWS AND POLICIES.
   a. The parties shall at all times comply with all applicable federal, state and local laws, regulations, executive orders and ordinances pertaining to their respective businesses, products or services, employment obligations, and the subject matter of this Contract. The parties shall at all times comply with all applicable

standards and policies of OSU, including without limitation any such laws or regulations regarding employment discrimination. If this Contract is being funded with federal funds, Contractor agrees to comply with all applicable federal contracting statutes, regulations and policies.

b. Without limiting the generality of the foregoing, Contractor expressly agrees to comply with the following laws, regulations and executive orders to the extent they are applicable to the Contract: (i) Titles VI and VII of the Civil Rights Act of 1964, as amended; (ii) Paragraphs 503 and 504 of the Rehabilitation Act of 1973, as amended; (iii) the Americans with Disabilities Act of 1990, as amended; (iv) Executive Order 11246, as amended; (v) the Health Insurance Portability and Accountability Act of 1996; (vi) the Age Discrimination in Employment Act of 1967, as amended, and the Age Discrimination Act of 1975, as amended; (vii) the Vietnam Era Veterans' Readjustment Assistance Act of 1974, as amended; (viii) ORS Chapter 659, as amended; (ix) the Family Educational Rights and Privacy Act of 1974, 20 U.S.C. § 1232g; (x) the Health Insurance Portability and Accountability Act requirements noted in OAR 125-055-0115; (xi) the Oregon Consumer Identity Theft Protection Act, ORS 646A.600-646A.628; (xii) all regulations and administrative rules established pursuant to the foregoing laws; and (xiii) all other applicable requirements of federal and state civil rights and rehabilitation statutes, rules and regulations. These laws, regulations and executive orders are incorporated by reference herein to the extent that they are applicable to the Contract and required by law to be so incorporated.

C. FEDERALLY REQUIRED PROVISIONS.

a. Equal Employment Opportunity – Contractor shall comply with E.O. 11246, "Equal Employment Opportunity," as amended by E.O. 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," and as supplemented by regulations at 41 CFR part 60, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor."

b. Rights to Inventions Made Under a Contract or Agreement – If this Contract is for the performance of experimental, developmental, or research work, the Federal Government and OSU have rights in any resulting invention in accordance with 37 CFR part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any implementing regulations issued by the awarding agency.

c. Clean Air Act (42 U.S.C. 7401 et seq.) and the Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.), as amended – If this Contract provides for payments in excess of $100,000, Contractor shall comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401 et seq.) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251 et seq.). Violations shall be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

d. Byrd Anti-Lobbying Amendment (31 U.S.C. 1352) – Contractors who apply or bid for an contract of more than $100,000 shall file a certification that it will not and has not used Federally appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a

Member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Contractor shall require any subcontractor who applies or bids for subcontract in excess of $100,000 to provide a similar certification to the next higher tier (Contractor or subcontractor as applicable). Each tier shall also disclose any lobbying with non-Federal funds in connection with obtaining any Federal award. Contractor or subcontractor must forward any disclosures from tier to tier up to OSU.

e. Debarment and Suspension (E.O.s 12549 and 12689) - No contract shall be made to parties listed on the General Services Administration's List of Parties Excluded from Federal Procurement or Nonprocurement Programs in accordance with E.O.s 12549 and 12689, "Debarment and Suspension." This list contains the names of parties debarred, suspended, or otherwise excluded by agencies, and contractors declared ineligible under statutory or regulatory authority other than E.O. 12549. If this Contract is in excess of the small purchase threshold, Contractor hereby certifies they are not listed on the General Services Administration's List of Parties Excluded from Federal Procurement or Nonprocurement Programs.

D. PUBLIC RECORDS LAW NOTICE.
OSU advises Contractor that information OSU receives may be subject to public inspection under Oregon Public Records Law (ORS 192.410-192.505).

E. SAFETY AND HEALTH REQUIREMENTS/HAZARD COMMUNICATION.
Services supplied under this Contract shall comply with all federal Occupational Safety and Health Administration (OSHA) requirements and with all Oregon safety and health requirements, including those of the State of Oregon Workers' Compensation Division. Contractor shall notify OSU prior to using products containing hazardous chemicals to which OSU employees may be exposed. Products containing hazardous chemicals are those products defined by Oregon Administrative Rules, Chapter 437. Upon OSU's request, Contractor shall immediately provide Material Safety Data Sheets, as required by OAR ch. 437, for the products subject to this provision.

F. EXPORT CONTROL.
Contractor acknowledges that OSU has students and faculty who are foreign nationals who may work with the services, product or technology received from Contractor pursuant to this Contract. Contractor represents that it has informed OSU in writing, prior to executing this Contract if it is providing OSU any product or technology subject to the U.S. Export Administration Act of 1979, the Export Administration Regulations and the International Traffic in Arms Regulations, and if so, under what Commerce Control List number(s) or U.S. Munitions List number(s) it is controlled.

G. FIREARMS POLICY.
OSU has a policy that prohibits Contractor and Contractor's employees, agents, and subcontractors from possessing firearms on OSU property.

H. PARKING.
Contractors doing business on the OSU campus may be required to have a permit to park if utilizing restricted street parking or parking lots. Contractor parking permits

may be obtained through OSU's Office of Transit & Parking Services.

I. SEXUAL HARASSMENT POLICY.
OSU has policies that prohibit sexual harassment of members of the OSU community and in keeping with those policies Contractor and Contractor's employees, agents, and subcontractors are prohibited from engaging in sexual harassment of members of the OSU community.

J. SMOKING POLICY.
OSU has a policy that prohibits Contractor and Contractor's employees, agents, subcontractors from smoking on the OSU campus or other OSU owned property. The smoking prohibition includes all indoor and outdoor spaces.

K. WEBSITE ACCESSIBILITY.
If Contractor is designing or developing web page(s) for OSU under this Contract, Contractor shall design and develop (as applicable) the web page(s) in conformance with OSU's Policy on Information Technology Accessibility available at http://oregonstate.edu/accessibility/ITpolicy.

7. GENERAL TERMS AND CONDITIONS:

A. ORDER OF PRECEDENCE.
In the event of a conflict, all the terms and conditions of this Contract, its exhibits, and any amendments thereto supersede all terms and conditions on any forms used by the Contractor.

B. NO THIRD PARTY BENEFICIARY.
OSU and Contractor are the only parties to this Contract and are the only parties entitled to enforce its terms. Nothing in this Contract gives, is intended to give, or shall be construed to give or provide any benefit or right, whether directly, indirectly, or otherwise, to third parties

C. ASSIGNMENT/SUBCONTRACT/DELEGATION.
Contractor shall not assign, subcontract, delegate or otherwise transfer any of its rights or obligations under this Contract, without the prior written approval of OSU. Any assignment of rights or delegation of duties is prohibited under this Section, whether by merger, consolidation, dissolution, operation of law or any other manner. Any purported assignment of rights or delegation of duties in violation of this Section is void. OSU's consent to delegation does not relieve Contractor of any of its performance obligations.

D. WAIVER.
No waiver of an obligation under this Contract is effective unless it is in writing and signed by the party granting the waiver. No failure or delay in exercising any right or remedy, or in requiring the satisfaction of any condition under this Contract operates as a waiver or estoppel of any right, remedy or condition.

E. ACCESS TO RECORDS AND AUDIT.
Contractor shall maintain accurate books, records, documents, and other evidence (collectively, "Records") following accounting procedures and practices sufficient to reflect properly all costs of whatever nature claimed to have been incurred and

anticipated to be incurred in the performance of this Contract. Contractor shall permit OSU and the federal government and their respective duly authorized representatives to have access to the Records that are directly pertinent to this Contract for the purpose of conducting an audit, or other examination, or for creating excerpts or transcripts. Contractor shall maintain Records for OSU's review for at least six years beyond the term of the Contract. Contractor shall promptly remedy any discrepancies involving deviation from the terms of this Contract and shall promptly reimburse OSU for any commitments or expenditures found by OSU to have been in excess of amounts authorized by OSU under this Contract.

OSU shall have the right to an independent third-party audit of the Contractor's records associated with or related to the goods or services provided for under this Contract. OSU may request an independent third-party audit no more than one time per calendar year. OSU will determine the time-period that will be the subject of the audit. However, the entire term of the Contract, including the original term and any subsequent renewals or extensions, may be the subject of the independent third-party audit at any time. Contractor shall bear the full cost of such independent third-party audit.

F. GOVERNMENT EMPLOYMENT STATUS.
Contractor certifies that either (a) it is not currently employed by OSU or the federal government; or (b) if Contractor is so employed, Contractor has fully disclosed to OSU in writing such employment status, is in full compliance with any statutes, regulation, and OSU or the federal government policies regarding employee contracting, and agrees to indemnify and hold harmless OSU for any failure by Contractor to comply with such statutes, regulations, or policies.

G. INDEPENDENT CONTRACTOR STATUS.
The services to be rendered under this Contract are those of an independent contractor. OSU reserves the right (a) to determine and modify the delivery schedule for the services and (b) to evaluate the quality of the services; however, OSU may not and will not control the means or manner of Contractor's performance. Contractor is responsible for determining the appropriate means and manner of performing the services. Contractor is not an officer, employee or agent of OSU as those terms are used in ORS 30.265. Contractor has no authority to act on behalf of OSU and shall not purport to make any representation, contract, or commitment on behalf of OSU.

H. NOTICE.
a. A party giving or making any notice, request, demand or other communication (each a "Notice") pursuant to this Contract shall give the Notice in writing and use one of the following methods of delivery: personal delivery, United States Postal Service Registered or Certified Mail (return receipt requested and postage prepaid), overnight courier (with all fees prepaid), facsimile or e-mail to the other party's address as listed on the signature page of this Contract. Notice to OSU is to be delivered to the Contract Administrator and Departmental Administrator except where this Contract expressly directs or permits delivery of Notice to a different Department.

b. Notice is effective: (i) if given by facsimile, upon receipt by the sending party of an appropriate facsimile confirmation; (ii) if given by e-mail, by confirmation of

receipt by return e-mail, which is not satisfied by an automatically-generated message that the recipient is out of the office or otherwise unavailable; or (iii) if given by any other means, when delivered at the address specified in this Section.

OSU Contract Administrator
OSU PCMM
ATTN: 180645 Contract Administrator
644 SW 13th Street
Corvallis, OR 97333
Telephone: (541) 737-4261
Fax: (541) 737-2170
E-mail: pacs@oregonstate.edu

and:

OSU Departmental Administrator
[Name]
[Title]
[Address]
[City, State, Zip]
Telephone: [Phone Number]
Fax: [Fax Number]
E-mail: [E-Mail Address]

CONTRACTOR Contract Administrator
[Name]
[Title]
[Address]
[City, State, Zip]
Telephone: [Phone Number]
Fax: [Fax Number]
E-mail: [E-Mail Address]

I. OSU NAME AND TRADEMARK.
Contractor shall not identify this Contract, nor use OSU's names, trademarks, service marks, or other proprietary marks in any of Contractor's marketing material, advertising, press releases, publicity matters or other promotional materials without the prior written consent of OSU, which consent may be withheld in OSU's sole discretion.

J. RECYCLED PRODUCTS.
Contractors will use recycled products, as defined in ORS 279A.010(1)(ii), to the maximum extent economically feasible in the performance of the Contract.

K. SALES AND USE TAXES.
OSU shall pay all applicable sales, excise, or use taxes in connection with this Contract. Invoices shall separately identify all such taxes and shall include either Contractor's sales tax or use tax permit number. Contractor shall be responsible for all other taxes, including taxes based upon Contractor's income. Contractor shall indemnify, defend, and hold harmless OSU from and against any interest, penalties, or other charges resulting from the non-payment or late payment of taxes or other charges for which Contractor failed to invoice OSU or which Contractor otherwise failed to pay in a timely manner.

L. FORCE MAJEURE.
Neither party is responsible for delay caused by an act or event that prevents the party from performing its obligations under this Contract where such cause is beyond the party's reasonable control and the nonperforming party has been unable to avoid or overcome the act or event by the exercise of due diligence. Such acts or events include without limitation fire, riot, acts of nature, terrorist acts, or other acts of political sabotage or war. Contractor shall make all reasonable efforts to remove or

eliminate such a cause of delay and shall, upon cessation of the cause, diligently pursue performance of its obligations under this Contract. However, if delay due to a force majeure event continues for an unreasonable time, as determined by OSU, then OSU is entitled to terminate the Contract.

M. MWESB REPORTING.

Upon request by OSU, Contractor is required to provide a report on the dollar volume of products provided under the Contract which are purchased by the Contractor from firms which are defined as follows:

Disabled Veteran Enterprise means a business that is at least 51% owned by one or more disabled veterans. A disabled veteran is a veteran of the military, naval, or air service of the United States with a service connected disability who is a resident of the State of Oregon. To qualify as a veteran with a service connected disability, the person must be currently declared by the United States Veterans Administration to be 10% or more disabled as a result of service in the armed forces. The business must be licensed and registered in the state of Oregon.

Disadvantaged Business Enterprise (DBE) is a small business with average annual gross receipts less than $17,420,000. The business must be owned and controlled by one or more socially and economically disadvantaged individual(s). The one or more socially and economically disadvantaged individual(s) must have made a contribution of capital to the business, which is commensurate with their ownership interest. Socially and economically disadvantaged individual(s) are people who have been subjected to racial or ethnic prejudice or cultural bias because of their identity as members of a group without regard to their individual qualities. The business must be independent. The business must be licensed and registered in the state of Oregon.

Emerging Small Business, (defined in ORS 200.005), is a licensed and registered business located in Oregon for which the average annual gross receipts for the three previous tax years do not exceed $3,266,219 for construction and $1,088,740 for non-construction businesses. The business must have fewer than 29 employees.

Minority Business Enterprise, (defined in ORS 200.005), is a business which is at least 51% owned by one or more minority individuals or, in the case of any publicly owned business, at least 51% of the stock of which is owned by minority individuals. Minority individuals are Black Americans, Hispanic Americans, Native Americans, Asian-Pacific Americans, and Asian-Indian Americans. The business must be licensed and registered in the state of Oregon.

Women Business Enterprise, (defined in ORS 200.005), is a business which is at least 51% owned by one or more women. The woman or women must have managerial and operational control over all aspects of the business. The one or more women owner(s) must have made a real and substantial contribution of capital or expertise to the business, which is commensurate with their ownership interest. The business must be licensed and registered in the state of Oregon.

This report shall be in consolidated form showing all such purchases under the Contract. This report will be provided on an annual basis to OSU. This report will provide a cumulative figure that shows year to date amounts for each supplier

ownership category.

N. EXECUTION AND COUNTERPARTS.
This Contract may be executed by facsimile or PDF and in two or more counterparts, each of which shall be deemed an original and all of which together shall constitute one instrument.

O. SURVIVAL.
The terms and conditions of this Contract that by their sense and context are intended to survive termination or expiration hereof shall so survive.

P. SEVERABILITY.
If any provision of this Contract is determined to be invalid, illegal or unenforceable, the remaining provisions of this Contract remain in full force and effect if the essential terms and conditions of this Contract for both parties remain valid, legal and enforceable.

Q. MERGER.
This Contract, including all documents referred to herein and attached hereto, constitutes the entire agreement between the parties and supersedes all prior representations, understanding and agreements between the parties. It is the complete and exclusive expression of the parties' agreement on the matters contained in this Contract. No amendment, consent, or waiver of terms of this Contract shall bind either party unless it is in writing and signed by authorized representatives of each of the parties. Any such amendment, consent, or waiver is effective only in the specific instance and for the specific purpose given.

ATTACHMENT A
DESIRED SPECIFICATIONS

Table of Contents

OSU Supplied Equipment

OSU will be providing equipment that must be utilized in the final design. The donated equipment list cannot be fully identified until an Award has been made to this RFP. The donated equipment will align with the Awarded Proposal so cannot be fully known upfront. The Awarded Proposer will be required to work with OSU in adjusting the submitted design and/or pricing accordingly. It is not anticipated that the donated equipment will have a major impact on any Proposal.

1. Overview:

1.1. Objective:

It is the intention of the Brewing Science Laboratory within the Department of Food Science to request proposals to design, fabricate, ship F.O.B. Destination, Prepaid and Allowed, and commission a fully automated research pilot brewing system to meet specifications within this document.
The Brewing Science Lab is world renown as a hop/beer research and brewing education center. The existing pilot brewery incorporates no automation and limited data acquisition but provides an excellent environment of experiential learning for brewing students. The modernization of the pilot brewery will encompass most current and vetted brewing technologies, incorporate automation and process control where possible, and implement data acquisition.

1.2. Performance Requirements:

The targeted brew-length for this traditional 5 vessel system is 2.5hl at 15P but the expectation is to produce 1.5 to 3 hl at 8 to 22 °Plato. Included in this request is a complete hot side brewhouse, cold side cellar/tank farm, CIP equipment, malt milling/handling, hot and cold water tanks, and system automation for process integration. The brewery must be flexible with the ability to easily incorporate, communicate with, and control additional equipment (mash filter, hammer mill, centrifuge – see section 14: Customer Supplied). The OEM is expected to incorporate donated equipment or software with no mark-up with the exception of implementation at cost (see Section 2.3 and 3.3 Hammer Mill and Meura Mash Filter).

1.3. Scope of Work:

The following sections define the scope of work planned for this project. The specifications stated here serve as desired minimum requirements and are not intended to limit alternatives or revisions that will result in an improved system.
Each section defines the deliverables associated with each functional area of the brewing system.

1.4. Instructions to Proposers:

For the purpose of these Desired Specifications, the Proposer is hereafter referred to as the “original equipment manufacturer” or “OEM”. The Oregon State University Brewing Science Laboratory is hereafter referred to as the “Customer”.
Proposers shall attach a copy of this document and annotate each specification item with the following (Attachment E):
C = Will comply with requirement as specified
X = Take exception to requirement as specified
A = Proposed alternative method or solution to requirement as specified. Attach additional pages with a detailed explanation to support consideration

2. Malt Handling, Milling, and Grist Handling:

2.1. Malt Handling:

The OEM shall provide a Malt Loading Bin (>50kg capacity). The Malt Loading Bin may be located on ground level with a chain conveyor or equivalent to transport malt to mezzanine level (approximately 5 m height) for milling.
Malt may be pre-weighed by customer prior to bin loading
OPTION: The Malt Loading Bin may be located on the mezzanine level (location of mills) with proper conveyance to the mills to eliminate conveyor system for cost savings.

2.2. Mill:

Provide a properly sized, adjustable gap, 4 roll Mill.

The Mill shall have a capacity of 100-500kg/hour to supply brewing industry standard grist. (Buhler LEFA –V2 or equivalent)
The Mill shall include an intermediate vibrating sieve to remove flour and fine grits between roller sets
Foreign material magnets shall be installed at the intake to protect the mills.

2.3. Hammer mill:

The OEM shall integrate a Customer supplied hammer mill into the system (including automation), for a Meura pilot mash filter (see Section 3.3). Mill will run at 500kg/h, motor specifications TBD.

2.4. Grist:

Grist from either Mill shall be delivered via chain conveyor or equivalent to a Grist Hopper (capacity =/>80kg grist) then diverted to either of two Mash Cookers.
Properly sized, solenoid operated, pneumatic actuated, butterfly/gate valves shall be provided to control flow of grist or malt.
The Grist Hopper shall be equipped with load cells integrated into the process control system to monitor and control grist weight.
Level sensors shall be provided to detect empty or overfilled bins/hoppers. This shall signal the controller to stop conveying or milling when bin/hopper is empty or overfilled.
Construction material of bins and hoppers shall be specified by OEM with consideration given to durability (durable paint on steel sheet is acceptable).

2.5. Controls for Malt Handling, Milling, and Grist Handling:

Item	Device	Measured Unit	Size
Malt Loading Bin Empty Detection	Level Switch		OEM specified
Malt Bin Overfill Detection	Level Switch		OEM specified
Conveyor to Mill Divert Valves for Malt	Proximity	Open/Closed	4” or DN100
Conveyor to Mash Divert Valves for Grist	Proximity	Open/Closed	
Grist Hopper	Load cells	Kg	=/>80kg
Grist Bin Overfill Detection	Level Switch		OEM specified
Conveyor Empty	TBD		OEM specified
Roller Mill	Motor		
Hammer Mill	Motor		
Malt Conveyor	Motor		
Grist Conveyor	Motor		

3. Brewhouse:

3.1. Mash Tuns/Cookers:

Mash cookers shall be sized to handle a varying grist load of 10-100 kg each.
Mash cookers shall have steam jackets on the bottom and on lower side wall of the vessel.
Each Steam jacket shall be individually controlled so a small amount of grist can be mashed using only the bottom jacket.
Each mash cooker shall be fully enclosed (upper hoods or tops) with manway access for maintenance, lighting, sight-glass (if manway is not clear), and vent stack.
Each mash cooker shall have a pre-masher/grist hydrator located on the top of the vessel, properly sized for hydration of grist.
Each mash cooker shall be agitated from the bottom with a frequency drive controlled motor. The agitators shall have stainless steel mixing blades. The peripheral speed of the agitator blades shall not exceed 3 m/s.
Heating of the mash shall be tightly controlled within 1°C of set temperature using </=14.9 psi steam. A heating rate of 1°C/minute is the target for a typical mash.

Two temperature transmitters shall be installed in each vessel, one in the lower section for adjunct cooking (10kg grain/adjunct coverage) and the other placed for full brew size.
The bottom of Mash Cookers shall be designed to ensure quick and efficient draining.
Each Mash Cooker shall have an appropriately sized outlet towards the lower bottom for quick and efficient transfer of mash/cereal out of and into vessel.
A properly sized, variable frequency drive controlled product pump (progressive cavity or positive displacement is preferred) shall be located between the two Mash Cookers so mash or adjunct can be pumped between vessels to facilitate decoction mashing or American double mash.
The same pump shall be suitable for transferring mash to the Lauter Tun or Mash Filter.
The OEM shall supply level transmitters to monitor vessel volumes and monitor volumes pumped into or out of vessel.
Both Mash Cookers shall be equipped with spray balls, piping, and valves and shall be fully integrated into the overall CIP system within the brewery.
Construction of vessels shall be FOOD GRADE 304. The OEM Shall specify gauge adequate for application. The vessels shall be adequately insulated, for brewery application, covering the steam jacketing, protected by external cladding.

For each Mash Cooker:

3.1.1. Size:

Grist load per cooker: 10-100 kg
Minimum size 2.5 hl
Maximum size 5 hl

3.1.2. Mechanical Equipment:

Manway
Sight glass
Light(s) fitting(s)
Pre-masher/grist hydrator for grist hydration installed in top of vessel
Variable frequency drive controlled agitator
Variable frequency drive controlled mash pump
Inlet in upper bottom of vessel for pumping mash in
Outlet in lower bottom of vessel for pumping mash out
Vent stack
CIP incorporated, spray ball, piping, and valves

3.1.3. Electrical Equipment:

Light(s)
Two temperature transmitters – lower for adjunct, middle for full brew
Modulating control for steam valves on two steam jackets on bottom and side-walls
Level transmitters
Flow meter for mash transfer between mash cookers or to lauter or mash filter
Variable frequency drive control for mash pump
Variable frequency drive control for agitator
Discrete control of inlet and outlet valves on vessel

3.1.4. Control for each Mash Cooker:

Item	Device or Property	Measured unit	Minimum/Maximum
Agitator	VFD Speed of rotation	Meters/second or RPM	<3 m/s at peripheral end of blade
Mash heating/cooking Control	Temperature Control	Degrees C	= 1°C/minute low limit = 5°C/minute high limit
Mash Temperature	Temperature Transmitter	Degrees C	One at 7-liter volume level One at 50-liter volume level

Mash Volume	Level Transmitter	Liters	10-liter low limit 300-liter high limit
Mash Flow	Flow Meter	Liters/minute	>=15 l/minute
Mash pump – cookers to lauter/mash filter	VFD	Meters/second or RPM	
Drain valve	State	Open/closed	
Inlet valve	State	Open/closed	

3.2. Lauter Tun:

The OEM shall supply a Lauter Tun appropriately sized to handle a 1.5hl 22°P through 3hl 8.0°P brew length with a load range of 120-220kg/m^2.
The Lauter Tun shall be equipped with topside manway, light, sight-glass (if manway is not clear), and vent stack.
The Lauter screen shall be milled top and bottom to appropriate size and open surface area to comply with industry standard (0.7 to 1.2 mm gaps and a free flow-through surface of up to 13%)
Screen shall be removable for proper cleaning and inspection
The Lauter Tun shall be equipped with a mash inlet towards the upper bottom above the Lauter screen and be sized to allow mash run-in times of less than 10 minutes and velocity in the inlet opening not greater than 1 m/s.
The Lauter Tun shall be equipped with a properly sized sparging system utilizing tempered brewing liquor – see water mixing station.
The Lauter Tun shall be fitted with a stainless steel raking system with mash knives, driven from the bottom of the tank with a variable frequency drive controlled motor. Knives shall be designed to guarantee uniformity of grain bed and prevent channeling. This system shall also serve as a spent grain bar (may be manually lowered for that operation).
Speed of rotation and depth of rakes shall be controlled via pressure differential from a pressure differential transmitter.
A “GEA Varinline” housing shall be placed on the run-off piping for a customer supplied optic meter placement at a future date.
The Lauter Tun shall be fitted with a spent grain opening and chute for simple grain-out to customer supplied grain cart.
A properly sized, variable frequency drive controlled product pump shall be provided for vorlauf and transfer of wort to kettle. A progressive cavity or positive displacement pump is preferred.
A mass flow meter (customer supplied) shall be installed in-line for measuring wort density, flow rate, flow total, and temperature.
The Lauter Tun shall be equipped with an elongated sight glass (heat resistant, Pyrex or equivalent) on the side of the vessel so mash bed striation can be observed.
The Lauter Tun shall be equipped with spray balls, piping, and valves and shall be fully integrated into the overall CIP system within the brewery. This includes spray jets under the Lauter screen.
Construction of vessel shall be FOOD GRADE 304. The OEM shall specify gauge adequate for application. The vessels shall be adequately insulated, for brewery application, covering the steam jacketing, protected by external cladding.

3.2.1. Size:

Lauter Tun total volume: 4-4.5hl.
Usable volume: 3.75-4.2hl.
Height of screen from bottom: 10-20mm.
Screen open surface: 11-13%

3.2.2. Mechanical Equipment:

Manway
Sight glass
Sight glass down the side for viewing of grain bed
Light(s) fitting(s)

Removable, milled lauter screen
Variable frequency drive controlled rake-speed
Automatic Rake height adjustment based on pressure differential of grain bed
Grain-out apparatus on rake assembly
Inlet in upper bottom of vessel for pumping mash in
Outlet in lower bottom of vessel for pumping wort out
Sparging system
Variable frequency drive controlled wort pump for Lauter/Mash Filter to Kettle
Varinline housing from GEA in piping from Lauter Tun outlet OPTION: optical sensor for turbidity measurement and rake height control in conjunction with pressure differential
Mass flow meter for wort to Kettle
Spent grain opening and chute
Sample cock for physical evaluation of wort run-off
Vent stack
CIP incorporated, spray ball, piping, and valves

3.2.3. Electrical Equipment:

Light(s) fitting(s)
Temperature transmitter
Pressure transmitter on side wall and under screen
OPTION: Optical sensor for turbidity
Mass flow meter
Variable frequency drive control for wort pump
Control of inlet and outlet valves on vessel

3.2.4. Control for Lauter Tun:

Item	Device or Property	Measured unit	Minimum/Maximum
Mash Inlet Valve	State	Open/closed	
Wort run-off valve	State	Open/closed	
Mash Inlet - run-off	Flow rate/totalized	Minutes	=/< 10 minutes
Mash Inlet - run-off	Flow Velocity	Meters/second	<1 m/s
Mash Differential	Pressure Indicator	mmWS	OEM specified
Wort run-off turbidity	Optical		OEM specified
Mash/bed temperature	Temperature transmitter	°C	
Rake Speed	Speed of rotation	Meters/second or RPM	Stop/slow
Knife Height	Pressure and/or Optical	mmWS and Trubidity	OEM specified
Wort pump – Lauter to Kettle	Frequency	m/s or rpm	Mash pump
Wort run-off to Kettle	Mass, flow rate, totalize	Plato, liters/minute, liters	

3.3. Mash Filter:

A 3 hl Meura Pilot Mash Filter – will be supplied by the customer. The Mash Filter will be shipped to the OEM location for integration with system or shipped to the installation location as directed by the OEM.

3.4. Kettle:

The OEM shall specify the size of Kettle. The Kettle shall be versatile in terms of volume flexibility, heating source, and hop form.
The Kettle shall be fitted with individually controlled steam jackets on the side and bottom for boiling with whole hops at various knockout wort volumes (1.5 – 3 hl).
An appropriately sized steam heated external Wort Boiler (<14.9 psi steam) shall also be integrated into the Kettle system, recipe options in control software will select which heating source is applied.
The external Wort Boiler shall be designed to accommodate pelletized hops or liquid hop products including appropriate valves to prevent inclusion of wort and hops when whole hops are used in the Kettle.

The OEM shall supply a properly sized variable frequency drive controlled pump to circulate wort from the bottom outlet to a wort spreader (through the external boiler if used or by-passed if not).
The Kettle shall be fitted with an over-boil preventer.
The Kettle shall be fitted with a Varinline housing from GEA located in kettle bottomThe Kettle shall be equipped with a topside manway, light, sight-glass (if manway is not clear), and vent stack appropriately designed to prevent condensate from return to the Kettle.
OPTION: The vent stack may be designed with a vapor condenser heat exchanger to capture energy from Kettle vapors and eliminate need for venting stack vapors from the brewery building. See specification of Brewery Vapor Removal (section 3.9. below).
The Kettle shall be equipped with spray balls, piping, and valves and shall be fully integrated into the overall CIP system within the brewery.
Construction of vessel shall be FOOD GRADE 304. The OEM shall specify gauge adequate for application. The vessels shall be adequately insulated, for brewery application, covering the steam jacketing, protected by external cladding.

3.4.1. Size:

Kettle total volume range: 4- 7hl.
Usable maximum volume: 3.5 -6.5hl.
Usable minimum volume: 1.5hl

3.4.2. Mechanical Equipment:

Manway
Sight glass
Light(s) fitting(s)
External boiler - <14.9 psi steam
Steam jacket on bottom of vessel and side walls
Varinline housing from GEA located in kettle bottomInlet in bottom of vessel for pumping wort in from lauter/mash filter
Inlet for pumping from external boiler
Outlet in lower bottom of vessel for pumping wort out
Variable frequency drive controlled wort pump – for circulation with or without external boiler and for transferring casting wort from Kettle to Whirlpool
Wort spreader
Flow meter for measuring flow of wort through external boiler and for cast wort
Vent stack
Vapor condenser
CIP incorporated, spray ball, piping, and valves

3.4.3. Electrical Equipment:

Light(s) fitting(s)
Over-boil sensor – safety shut-off of steam to prevent boiling wort from exiting Kettle
Temperature transmitter
Level transmitter
Modulating control for steam valves on jackets and on external boiler
Variable frequency drive control for wort pump
Discrete control of inlet and outlet valves on vessel
Flow meter between outcast pump and external boiler

3.4.4. Control for Kettle:

Item	Device or Property	Measured unit	Minimum/Maximum
Wort Inlet Valve from Lauter Tun	State	Open/closed	
Wort Volume from Lauter Tun	Flow/total	Liters	
Wort Inlet Valve from External Wort	State	Open/closed	

Boiler			
Wort Density from Lauter Tun	Mass flow meter	Density or °P	
Wort run-off valve	State	Open/closed	
Flow meter – pump and external boiler	Flow rate	Liters/minute	
Wort pump – Kettle to Whirlpool	Frequency	m/s or rpm	
Temperature Control, cascaded	Wort temperature Steam pressure	°C PSI or Equivalent	</= 14.9 psi

3.5. Whirlpool:

Whirlpool shall be designed for proper separation of hot-break and solids material.
A heat exchanger between Kettle and Whirlpool shall be provided. The heat exchanger shall be properly sized to lower the temperature of the wort from 100°C to less than 80°C during transfer from Kettle using water from the customer's cooling tower or CLT. The heat exchanger shall be equipped with piping and valves and shall be fully integrated into the overall CIP system within the brewery. The heat exchanger may be the same heat exchanger used for final wort cooling but shall be designed and installed to use the hop back for worts containing whole hops.
The Whirlpool shall be equipped with topside manway, light, sight-glass (if manway is not clear), and vent stack.
The Whirlpool shall be equipped with spray balls, piping, and valves and shall fully integrated into the overall CIP system within the brewery.
Construction of vessel shall be FOOD GRADE 304. The OEM shall specify gauge adequate for application. The vessels shall be adequately insulated, for brewery application, covering the steam jacketing, protected by external cladding.

3.5.1. Size:

Whirlpool total volume: 6 – 9hl.
Usable maximum volume: 6 – 9hl.
Usable minimum volume: 1.5hl.
Ratio of diameter to wort height 3:1 @ 2.5hl

3.5.2. Mechanical Equipment:

Manway
Sight glass
Light(s) fitting(s)
Heat exchanger for wort from kettle – tube and shell or plate and frame – OEM specified
Valves for cooling water to heat exchanger
Piping and valves to hop-back pre and post whirlpool
Inlet in bottom of vessel for pumping wort in from the kettle
Outlet in lower bottom of vessel for pumping wort out
Variable frequency drive controlled wort pump to heat exchanger
Flow meter
Vent stack
CIP incorporated, spray ball, piping, and valves

3.5.3. Electrical Equipment:

Light
Temperature transmitter
Level transmitter
Variable frequency drive control for wort pump
Discrete control of inlet and outlet valves on vessel
Discrete control of valves to hop-back

Flow meter between outcast pump and heat exchanger
Temperature control of wort from kettle to whirlpool

3.5.4. Control for Whirlpool:

Item	Device or Property	Measured unit	Minimum/Maximum
Wort Inlet Valve from kettle	State	Open/closed	
Flow meter – wort flow rate and volume from kettle	Flow/total	Liters/minute	
Wort pump – whirlpool to heat exchanger	VFD	m/s or rpm	OEM Specified
Temperature indicator and control –Wort cooling at heat exchanger	Temperature transmitter	Degrees C	Reduce cast wort from +100°C to </=80°C
Wort outlet valve from whirlpool	State	Open/closed	
Valves to/from hop-back	State	Open/closed	
Flow meter – wort flow rate and volume from whirlpool to heat ex	Flow/total	Liters/minute	OEM Specified

3.6. Hop Back:

The Hop back shall be designed to hold all types of hop material (whole hops, pelletized hops).
The Hop back shall have the flexibility to run wort from kettle through hop back to whirlpool or whirlpool through hop back to heat exchanger.
The Hop back shall be equipped with spray balls, piping, and valves and shall be fully integrated into the overall CIP system within the brewery.
Construction of vessels shall be FOOD GRADE 304, OEM will specify gauge adequate for application.

3.7. Heat Exchanger and Aeration:

The OEM shall supply a properly sized two-stage heat exchanger that will utilize cooling water from customer's cooling tower or CLT for stage one and glycol from customer's glycol unit for stage two.
The Heat exchanger shall be constructed of suitable materials typical for a brewery heat exchanger.
The OEM shall supply an aeration system for cooled wort from heat exchanger with the ability to accurately deliver sterile air or O2 as specified by OEM.
The aeration system shall be equipped with an air/gas flow meter and sight glass.
The aeration system shall accurately deliver air/O_2 to achieve a specified dissolved oxygen (DO) level between 6 and 20 ppm O_2.
The OEM shall install a Varinline housing from GEA in piping for future implementation of in-line DO measurements.
The Heat exchanger and aeration system shall be equipped with piping and valves and shall be fully integrated into the overall CIP system within the brewery.

3.7.1. Size:

The OEM shall specify for cooling =/< 3hl wort from 100°C to ~20°C in first stage and 25°C to 8°C in second stage –product capacity of 0.6m^3/h – 600 liters per hour.
Aeration system shall deliver dissolved O2 in wort in a selectable range from 6-20 ppm.

3.7.2. Mechanical Equipment:

Sight glass
Two stage heat exchanger
Valves for cooling water to heat exchanger

Valves for glycol to heat exchanger
CIP incorporated piping and valves for heat exchanger and aeration system
Wort aeration jet
Air/gas meter
Varinline housing from GEA

3.7.3. Electrical Equipment:

Light(s) fitting(s)
Temperature transmitters for wort entering and leaving heat exchanger
Temperature transmitters for cooling water entering and leaving heat exchanger
Temperature transmitters for glycol entering and leaving heat exchanger
Temperature control of wort

3.7.4. Control for heat exchanger:

Item	Device or Property	Measured unit	Minimum/Maximum
Temperature transmitters and control – Wort cooling at heat exchanger	Temperature	Degrees C	Reduce cast wort from +100°C to </=80°C

3.8. Brewhouse Skid and Deck:

The equipment listed for the hot side of the brewhouse shall be mounted on a properly sized skid constructed of stainless steel.
The OEM shall supply a brewing deck for ease of access to the hot side vessels.
The deck shall provide sufficient overhead clearance to allow access and observation of piping, valves, and mechanical under the deck.
The top of the deck should be between 121cm(4ft) and 152cm (5ft). Maximum area height for the hot side brewhouse is approximately 365cm (12ft).
The deck shall be made of stainless steel material and take into account safety and ergonomic concerns for operators and observers.
The deck shall have stainless steel railings and stairs on both ends for ease of access. Final measurements and dimensions will be determined after drawings and engineering of the project are completed.

3.9. Brewhouse Vapor Removal:

The brewery location in a historic district prohibits venting of vapors from the side of the building.
The ceiling height is approximately 8.2 meters. A single vent stack penetrating the roof may be acceptable to the Historic District.
OPTION: A vapor-condensing unit for the Brewhouse vessels may be implemented as an alternate to a vent stack.

3.10. Brewhouse piping, valves, wiring, and pneumatics:

All piping and valves shall be stainless steel and shall meet food grade standards. The OEM shall specify the appropriate sizing and construction.
OEM shall supply a hard pipe fence and gate from the brewhouse to the cellar for wort transport and CIP/return. Flexibility needs to be built in so the cellar can be cleaned concurrently during a brew. Hose may be used from the cellar gate to individual CCV tanks for cost savings.The OEM shall assemble, pipe, wire, fit, and test all systems of the Brewhouse at the manufacturer's site with suitable break points, terminations, labeling and documentation to support final installation at the installation site without the aid of the OEM.

4. Water Handling System:

4.1. Hot Liquor Tank (HLT):

The HLT shall be sized appropriately to supply the Brewhouse with hot water to support two brews in one day.
The unit may be heated with either a steam jacket or internal coil and shall be equipped with temperature control and level control.
The HLT shall be equipped with a pump to transfer hot water to the mixing station.
The HLT shall be equipped with spray balls, piping, and valves and shall be fully integrated into the overall CIP system within the brewery
Construction of vessel shall be FOOD GRADE 316. The OEM shall specify gauge adequate for application. The vessels shall be adequately insulated, for brewery application, covering the steam jacketing, protected by external cladding.

4.1.1. Mechanical Equipment:

Modulating valve for temperature control
Valves
Pump

4.1.2. Electrical Equipment:

Temperature transmitter
Temperature controller
Level transmitter
Tank full level switch

4.1.3. Control for HLT:

Item	Device or Property	Measured unit	Minimum/Maximum
Temperature transmitter and control – Hot water	Temperature	Degrees C	OEM Specified
Content Probe	State	On/off	
Tank Full Level Switch	State	On/off	
Pump	State	On/off	

4.2. Cold Liquor Tank:

The CLT shall be sized appropriately to supply the Brewhouse with cold water for two brews in one day.
The CLT unit shall be equipped with temperature transmitter and level control.
The CLT shall be equipped with spray balls, piping, and valves and shall be fully integrated into the overall CIP system within the brewery.
Construction of vessel shall be FOOD GRADE 304. The OEM shall specify gauge adequate for application. The vessels shall be adequately insulated, for brewery application, covering the wall and bottom and protected by external cladding.

4.2.1. Mechanical Equipment:

Valves
Pump

4.2.2. Electrical Equipment:

Temperature transmitter
Level transmitter
Tank full level switch

4.2.3. Control for CLT:

Item	Device or Property	Measured unit	Minimum/Maximum
Temperature transmitter – cold water	Temperature	Degrees C	
Content probe	State	On/off	
Tank Full Level Switch	State	On/off	
Pump	State	On/off	

4.3. Mixing Station:

A mixing station for water from the HLT and CLT to Brewhouse shall provide water at variable set temperatures to appropriate locations such as strike water, sparge water, and cooling water.
The mixing station shall be automated and connected to the process controller.
The station may also accommodate the CIP skid. This shall be the input location for the CIP access to the brewery in the form of a CIP-water-panel.

4.3.1. Mechanical Equipment:

Modulating valves with positioners, pneumatically actuated for temperature control
CIP water flow connection panel, manual valves and swivel bend to direct CIP to brewhouse process equipment

4.3.2. Electrical Equipment:

Temperature controller
Flow meter for water mixing station

4.3.3. Control for Mixing Station:

Item	Device or Property	Measured unit	Minimum/Maximum
Flow meter – water flow rate and volume from HLC and CLT	Flow/total	Liters/minute	
Temperature transmitter and control - Hot and cold water mixing	Temperature	Degrees C	

4.4. Water Treatment:

Customer supplied
OPTION: High flow, carbon filter for incoming water to HLT and CLT

5. Cellar:

The cellar shall be composed of (10-15) 1.5 hl usable volume CCV tanks.
(4 to 6) 3 hl usable volume tanks.
(2 to 4) 6 hl usable volume tanks.
One 3 hl usable volume pressure rated (=>25psi) tank
One 6 hl usable volume pressure rated (=>25psi) tank

The tanks may be mounted on skids for ease of shipment and cost savings.
The tank dimensions shall be specified by the OEM based on requirements.
1.5 hl and 3 hl tanks shall have cooling jackets on the cone and sidewall .
6 hl tanks shall have two side wall jackets as well as a cone jacket to support capacity for one or two brews.
The Fermentors shall be equipped with precise temperature control with a range of -2°C to 25°C.
The Tanks will have manways for accessing interior, preferably at the top.
The Fermentors will be equipped with spray balls, piping, and valves and shall be fully integrated into the overall CIP system within the cellar.

The OEM shall supply a movable, centrifugal beer pump to transfer product. The OEM will shall specify an appropriately sized pump for this application.
Construction of vessels shall be FOOD GRADE 304. The OEM shall specify gauge adequate for this application.
Vessels shall be jacketed with appropriate insulation, for brewery application covering the tank wall and protected by stainless steel cladding.

5.1. Mechanical Equipment:

FOOD GRADE 304 SS Food and beverage grade
Dimple jackets on two cooling zones for glycol, one on cone, one on sidewall
For the 6 hl only:
Dimple jackets on cooling zones for glycol, one on cone, two zonal sidewall jackets to facilitate 3 and 6 hl ferments (individual cooling zones for each). Temperature transmitter well number and location to be determined by the OEM to ensure maintenance of accurate cooling temperature.
The Fermentors shall have 55 - 60 degree cone angle
Non-pressure rated at 14.9 PSI
Pressure rated tanks at 25 PSI
The Fermentors shall be double walled and insulated
Adjustable feet for leveling or on multiple tanks on a leveling skid
Rotating racking arm/valve
Sample valve – Perlick style
Drain elbow/valve
Port for inserting carbonation stone
Temperature well (dimensions of well to be determined by supplier)
Clamps and gaskets for valves/accessories
Lift and ladder hooks for 6 bbl tank (TBD by supplier) if necessary
Manway– top manway preferred (with “D” ring for hop bag)
4” TC Top port with stainless steel “D” ring for hop bag if top manway is not employed
Sight glass
Light(s) fitting(s)
Service valves for cooling jackets from glycol
Cleaning/air valve combination with non-return valve, safety valve, and vacuum valve
Adjustable bunging apparatus
CIP incorporated, spray ball, piping, and valves
Movable centrifugal beer pump for the cellar

5.2. Electrical Equipment:

Light(s) fitting(s)
Temperature transmitters
Temperature control
Temperature control panel for cellar

5.3. Control for Fermentor:

Item	Device or Property	Measured unit	Minimum/Maximum
Temperature Control	Temperature transmitter/control	°C	OEM Specified

6. CIP System:

The OEM shall provide a CIP system with a moveable pump for CIP return.
The CIP system shall be integrated in the automation controller application program to perform proper cleaning and to ensure a hygienic state of all process equipment.
OEM shall supply conductivity measurements in-line on the unit to ensure proper chemical concentration.

6.1. Mechanical Equipment:

FOOD GRADE 316 construction
Steam or electric heat
Valves for inlet and outlet
Sight glass
Strainer
CIP supply pump
CIP return pump

6.2. Electrical Equipment:

Temperature transmitter
Temperature Control
Conductivity transmitter

6.3. Control for CIP System:

Item	Device or Property	Measured unit	Minimum/Maximum
Temperature Control	Temperature transmitter/control	°C	OEM Specified
Caustic Concentration	Conductivity transmitter	microSiemen/cm	OEM Specified

7. Glycol Unit:

The OEM shall specify a glycol chiller unit with the capacity to support the Fermenter tank farm and second stage of heat exchanger. The customer will buy the glycol chiller separately based on recommendation specified by OEM.

8. Condensate Return:

All equipment using steam as the heating source shall be connected to a central condensate return line.
A condensate return pump shall be installed in-line to return condensate to the steam plant.
The OEM shall specify the condensate return pump based on over-all design of the brewhouse and condensate to be generated.

9. Dust Handling:

Brewing system and controller application program shall be designed to support dust handling at the grain bin, mills, and grist hopper.
The OEM shall specify a Dust collection system of appropriate size for safe and efficient dust removal.
OPTION: The Dust collection system may be supplied by customer for cost savings.

10. Design, Automation, and Control:

Automation and control shall be presented in process flow sheets, piping and instrument diagrams (P&ID), process descriptions, equipment selection, and definitions of measuring instruments and automation
These models shall be clearly segregated into these categories:

1. Milling and Malt Handling
2. Brewhouse
3. Cellar, CIP Plant, Hot and Cold Liquor System

The OEM shall supply a fully automated electronic control to support the complete brewery plant including:

- Milling, malt handling, grist handling, and dust control
- Mashing

- Lautering
- Wort boiling
- Hop dosing
- Whirlpool
- Wort cooling
- Brewhouse water handling
- CIP-cycles for the Brewhouse
- Vapor removal
- Condensate removal
- Control of temperature in the tank farm/cellar

The control system will work within a commonly used brewing software platform designed for process automation.
Siemens US will supply a Siemens Braumat Compact control system based on its SIMATIC PCS 7 control system platform. To include such hardware and software necessary for control and visualization of the new research brewery here at OSU.

The control system shall be flexible and adjustable in the field by the customer to allow adding new equipment, monitoring and control as needed. The control system application programs shall be open and not protected so customer can make changes and modifications to the process and controls as needed.
The OEM shall grant free license to OSU to use and revise application programs.
OSU and its representatives will not divulge or otherwise share OEM's intellectual property with others without prior consent and signed non-disclosure agreement.
The customer agrees to protect the intellectual property of the OEM.
The control system shall integrate all I/O's, MCC, VFD's, temperature regulation, analogue and digital inputs and outputs, all starter motors, and valve blocks.
The proposal shall include all control enclosures, PLC, computer, licenses, programs, and visualization.

11. Data Acquisition:

All process data from the Brewhouse and other subsequences from the brewing process shall be archived into a file format that can be easily accessed by the staff.
Data shall be stored in such a way as to provide easy access to past brews history. Data should be easily exported to EXCEL, XML, or Dbase files.

12. ASME, Control Enclosures, and Electrical Components:

All mechanical components will be calculated and engineered in accordance with ASME regulation.
Control enclosures and all electrical equipment for controlling the brewery shall be UL listed and stamped.
Control enclosures shall be NEMA 4-X rated enclosures or equivalent.
All electrical components will be engineered in accordance with UL and NEC regulations and acceptable for us in the United States.

13. Pumps:

Pump	Control	Type	Flow Rate Range l/m
Mash Pump between cookers and cast	Variable Frequency	Progressive cavity or positive displacement	0-20 l/m
Wort Pump from Lauter Tun/Mash Filter to Kettle	Variable Frequency	Progressive cavity or positive displacement	0-5 l/m
Boiler and cast Wort Pump from Kettle to Whirlpool	Variable Frequency	Centrifugal	0-40 l/m
Cast wort from Whirlpool to heat exchanger	Variable Frequency	Centrifugal	0-10 l/m
Hot Liquor Tank to Mixing Valve	On/off	Centrifugal	
Cold Liquor Tank to Mixing Valve	On/off	Centrifugal	
CIP Supply	On/off	Centrifugal	
CIP Return	On/off	Centrifugal	

Centrifugal pumps shall be from one manufacturer with parts lead time of less than one week. Progressive cavity or positive displacement pumps shall be from one manufacturer with parts lead time of less than one week.
Option: The number of pumps may be reduced by serving multiple duties if piping, valving, and automation can accommodate.

14. OSU Supplied Services, Commissioning and Training:

Power: 110V 100amp, 208V 100amp, 480V 60amp
Steam: 70 psi, food grade boiler chemicals, condensate return to steam plant
Compressed air: 100 psi dry air
Water: 60 psi potable and industrial water
Cooling water: 22°C cooling water from tower, capacity TBD based on demand
Siemens US will supply a Siemens Braumat Compact control system based on its SIMATIC PCS 7 control system platform; to include such hardware and software necessary for control and visualization of the new research brewery here at OSU. Commissioning and Training shall be provided by Awarded Proposer.

ATTACHMENT B
PRICING (Exhibit D of RFP)

EXHIBIT B
CERTIFICATIONS

By signature on this certification the undersigned certifies that they are authorized to act on behalf of the Proposer and that under penalty of perjury the undersigned will comply with the following:

SECTION I. OREGON TAX LAWS
The undersigned hereby certifies under penalty of perjury that the Proposer, to the best of the undersigned's knowledge, is not in violation of any tax laws described in ORS 305.380(4).

SECTION II. AFFIRMATIVE ACTION
The undersigned hereby certifies that they have not discriminated against Minority, Women or Emerging Small Business Enterprises in obtaining any required subcontracts, pursuant to OSU Standard 580-061-0030 (3).

SECTION III. COMPLIANCE WITH SOLICITATION
The undersigned agrees and certifies that they:
1. Have read, fully understands and agrees to be bound by the Request for Proposal and all Exhibits and Addenda to the Request for Proposal; and
2. Are an authorized representative of the Proposer, that the information provided is true and accurate, and that providing incorrect or incomplete information may be cause for rejection of the Proposal or Contract termination; and
3. Will furnish the designated item(s) and/or service(s) in accordance with the Request for Proposal and the Contract; and
4. Has provided a correct Federal Employer Identification Number or Social Security Number with the Proposal.

SECTION IV. PERMISSIVE COOPERATIVE PROCUREMENTS
If Proposer is awarded a contract from this Request for Proposal, Proposer hereby (check one)

☐ agrees

☐ disagrees

to offer the resulting contractual terms and prices to other public institutions.

Authorized Signature:_____ Date:_____

Name (Type or Print):_____ Telephone:(_____)_____

Title:_____ Fax:(_____)_____

FEIN ID# or SSN# (required):_____ Email:_____

Company:_____

Address, City, State, Zip:_____

Construction Contractors Board (CCB) License Number (if applicable):_____

Business Designation (check one):
☐ Corporation ☐ Partnership ☐ LLC ☐ Sole Proprietorship ☐ Non-Profit

EXHIBIT C
REFERENCES

REFERENCE 1

COMPANY: _____ CONTACT NAME: _____
ADDRESS: _____ PHONE NUMBER: _____
CITY, STATE ZIP: _____ FAX NUMBER: _____
WEBSITE: _____ E-MAIL: _____
GOODS OR SERVICES PROVIDED: _____

REFERENCE 2

COMPANY: _____ CONTACT NAME: _____
ADDRESS: _____ PHONE NUMBER: _____
CITY, STATE ZIP: _____ FAX NUMBER: _____
WEBSITE: _____ E-MAIL: _____
GOODS OR SERVICES PROVIDED: _____

REFERENCE 3

COMPANY: _____ CONTACT NAME: _____
ADDRESS: _____ PHONE NUMBER: _____
CITY, STATE ZIP: _____ FAX NUMBER: _____
WEBSITE: _____ E-MAIL: _____
GOODS OR SERVICES PROVIDED: _____

EXHIBIT D
PRICING SHEET

	Item	QTY	Unit Price	Total
1	Malt Handling System	1		0
2	Four Roller Malt Mill	1		0
3	Integration of Customer Supplied Hammer Mill	1		0
4	Grist Handling System	1		0
5	Mash Tun with Agitator and Temperature Control	2		0
6	Integration of Customer Supplied Meura Mash Filter	1		0
7	Lauter Tun with Adjustable Rakes	1		0
8	Kettle with Steam Jackets and External Colandria	1		0
9	Whirlpool	1		0
10	Whirlpool Heat Exchanger	1		0
11	Hop Back	1		0
12	Heat Exchanger - Two Stage for Wort Cooling	1		0
13	Aeration System for Wort	1		0
14	Brewhouse Skid and Deck (Stainless Steel)	1		0
15	Brewhouse Vapor Removal System	1		0
16	Brewhouse Piping, Valves, Wiring, Condenstate Return and Pneumatics	1		0
17	Hot Liquor Tank with Temperature Control	1		0
18	Cold Liquor Tank	1		0
19	Water Mixing Station	1		0
20	Clean in Place System on Movable Skid	1		0
21	1.5 hl CCV Fermentation Tanks with Valves and Fittings (10-15 ea)	15		0
22	3 hl CCV Fermentation Tanks with Valves and Fittings (4-6 ea)	6		0
23	6 hl CCV Fermentation Tanks with Valves and Fittings (2-4 ea)	4		0
24	Dust Handling System	1		0
25	Design, Automation, Control, and Data Acquisition (including computers)	1		0
26	Control Enclosures and Electrical Components	1		0
27				0
28	Commissioning	1		0
29	Training	1		0
30	Shipping	1		0
	TOTAL PROPOSED SOLUTION COSTS			

Note: Please complete provided pricing sheet above. OSU desires, if necessary, due to budgetary constraints, to remove non-priority items. Attach supporting documentation and clarifications if required.

EXHIBIT E
SPECIFICATIONS COMPLIANCE SUMMARY

C = Will comply with requirement as specified
X = Take exception to requirement as specified
A = Proposed alternative method or solution to requirement as specified.

C	X	A	Item
			2. Malt Handling, Milling, and Grist Handling
			2.1. Malt Handling System
			2.2. Four Roll Malt Mill
			2.3. Integration of Customer Supplied Hammer Mill
			2.4. Grist Handling System
			2.5. Controls for Malt Handling, Milling, and Grist Handling
			3. Brewhouse
			3.1. Mash Tuns/Cookers
			3.1.1. Size - Mash Tuns
			3.1.2. Mechanical Equipment - Mash Tuns
			3.1.3 Electrical Equipment - Mash Tuns
			3.1.4 Control – Mash Tuns
			3.2. Lauter Tun
			3.2.1. Size - Lauter Tun
			3.2.2. Mechanical Equipment - Lauter Tu
			3.2.3 Electrical Equipment - Lauter Tun
			3.2.4 Control – Lauter Tun
			3.3. Integration of Mash Filter
			3.4. Kettle
			3.4.1. Size - Kettle
			3.4.2. Mechanical Equipment - Kettle
			3.4.3 Electrical Equipment - Kettle
			3.4.4 Control – Kettle
			3.5. Whirlpool
			3.5.1. Size - Whirlpool
			3.5.2. Mechanical Equipment - Whirlpool
			3.5.3 Electrical Equipment - Whirlpool
			3.5.4 Control – Whirlpool
			3.6. Hop Back
			3.7. Heat Exchanger and Wort Aeration
			3.7.1. Size – Heat Exchanger/Aeration System
			3.7.2. Mechanical Equipment – Heat Exchanger/Aeration System
			3.7.3 Electrical Equipment – Heat Exchanger/Aeration System
			3.7.4 Control – Heat Exchanger/Aeration System
			3.8. Brewhouse Skid and Deck
			3.9. Brewhouse Vapor Removal
			3.10. Brewhouse Piping, Valves, Wiring, and Pheumatics

C	X	A	Item
			4. Water Handling System
			4.1. Hot Liquor Tank
			4.1.1. Mechanical Equipment - HLT
			4.1.2. Electrical Equipment - HLT
			4.1.3. Control - HLT
			4.2. Cold Liquor Tank
			4.2.1. Mechanical Equipment - CLT
			4.2.2. Electrical Equipment - CLT
			4.2.3. Control - CLT
			4.3. Mixing Station
			4.3.1. Mechanical Equipment – Mixing Station
			4.3.2. Electrical Equipment – Mixing Station
			4.3.3. Control – Mixing Station
			4.4. Water Treatment – OEM Supplied High Flow Carbon Filter for Sweet Water
			5. Cellar
			5.1. Mechanical Equipment - Cellar
			5.2. Electrical Equipment - Cellar
			5.3. Control - Cellar
			6. CIP System
			6.1. Mechanical Equipment - CIP
			6.2. Electrical Equipment – CIP
			6.3. Control - CIP
			7. Glycol Unit – OEM Specifications, Customer Supplied
			8. Condensate Return
			9. Dust Handling System
			10. Design, Automation, and Control
			11. Data Acquisition
			12. ASME, Control Enclosures, and Electrical Components
			13. Pumps
			14. Customer Supplied Services

Provide necessary supporting documentation when taking exception clearly describing your proposed solution.