



OLYMPIC VALLEY PUBLIC SERVICE DISTRICT



EXHIBIT F-11
17 Pages

305 OLYMPIC VALLEY ROAD HVAC REPLACEMENT PROJECT

DATE: March 25, 2025

TO: District Board Members

FROM: Dave Hunt, District Engineer

SUBJECT: Professional Services Agreement (PSA) with an Independent 3rd Party Commissioning Services Consultant for the 305 Olympic Valley Road HVAC Replacement Project

BACKGROUND: Design and permitting for the 305 Olympic Valley Road HVAC Replacement Project is on-going, with bidding expected in April and a construction contract award at the May Board meeting.

At this time, the District needs to bring on a commissioning agent to provide independent 3rd party commissions services for the project.

DISCUSSION: An independent 3rd party commissioning agent is critical for the success of this project and necessary to ensure that the new boiler and control system functions as designed to meet required performance standards. The commissioning agent will reduce the risk of future issues through early identification of installation errors, design flaws, and/or operational inefficiencies.

Scope of work:

- Design review
- Review of contractor submittals
- Development of the commissioning plan
- Performance verification
- Code and standard compliance
- System testing and optimization
- Comprehensive documentation

The District and our mechanical engineer, AA-ME, interviewed and requested proposals from three (3) specialized commission consultants, including RSACx, UNVC, and McKinstry. Proposals were submitted by RSACx and UNVC with fee

estimates ranging from \$32,000-\$43,300. Staff and AA-ME are currently reviewing the proposals, and checking references, with a consultant selection in early March to keep up with our current design/bid/build schedule.

To maintain the project schedule, staff recommend that the Board authorize the General Manager to execute a Professional Services Agreement with the selected consultant in an amount not to exceed \$32,000-\$43,300.

ALTERNATIVES: 1. Approve a proposal from a 3rd party commissioning services for the 305 Olympic Valley Road HVAC Replacement Project in an amount not to exceed 43,300.

2. Do not approve a proposal for commissioning services.

FISCAL/RESOURCE IMPACTS: The project is budgeted as a capital replacement project funded equally through the Fire Department and Utility Department reserves. The total project budget is \$1,500,000 and includes consulting services for design, permitting, construction management, and 3rd party commissioning, construction, and District staff time.

RECOMMENDATION: Authorize the General Manager to execute a Professional Service Agreement with a 3rd party commissioning services consultant in an amount not to exceed \$43,300.

ATTACHMENTS:

- Proposal from RSACx dated March 12, 2025
- Proposal from UNVC dated March 17, 2025

DATE PREPARED: March 17, 2025

To: Olympic Valley Public School District

Attn: Dave Hunt

March 12, 2025

Project: Olympic Valley Boiler Replacement and VAV Upgrade

#25011-Cx

RSACx is pleased to provide this proposal to provide independent 3rd Party Commissioning Services for the above-mentioned project. RSACx is a charter member of the AABC Commissioning Group (ACG). Members of RSACx are LEED Accredited Professionals.

Scope of Work:

- **RSACx** shall provide documented confirmation that **ALL** systems and equipment associated with this project documents (***Design Development Drawing 2/6/25***) and as identified in the *Systems To Be Commissioned* section below, function according to criteria set forth in the project documents to satisfy the owner's operational needs.
- **RSACx** shall carry out this plan in 4 phases in accordance with project specifications, ACG commissioning guideline.
- All commissioning documentation including but not limited to, on-going project issues and corrections, Cx plan, contractor Pre-Functional Check Lists, Cx schedules and responsibilities will be maintained and updated on the **RSACx** web-based commissioning portal with access provided to all commissioning team members

Planning / Implementation:

- Review Owners Project Requirements (OPR) and Basis of Design (BOD)
- Design review 95% CD **See pricing (a1)**
- Review contractor submittals **See pricing (a1)**
- Provide commissioning milestones and durations, for inclusion into the master schedule
- Develop the commissioning plan, including Pre-Functional Check Lists (PFCL)
- Develop web-based commissioning portal
- Hold commissioning kick-off meeting (Via Virtual Meeting) to assemble the Cx team and educate all members of their individual roles and responsibilities during the commissioning process

Construction:

- Update the commissioning plan
- Coordinate/schedule the commissioning process
- Observe site installations
- Document and track construction issues
- Develop Functional Performance Test (FPT)
- Track and review PFCL's (Completed by contractors)
- Track and review contractor equipment and system start-ups
- Track and review BMS point verification
- Track and review BMS graphic screenshots
- Review final test and balance report

Acceptance:

- Carry out and document Functional Performance Tests on the systems and equipment associated with this project and as identified in the *Systems To Be Commissioned* section below
- Verify reported test and balance results
- Document and track issues discovered during FPT's
- Verify training requirements are completed
- Submit final commissioning report

Post Acceptance:

- Verify all corrective items are complete from acceptance phase
- Perform seasonal testing as required for cooling and heating systems

Systems To Be Commissioned Are Outlined Below:

- (2) Boilers, (2) Heat Exchangers, (7) Pumps, (1) Glycol Feeder, (1) Existing AHU, (32) VAV boxes
 - Automation system controls hardware and software
 - HVACR systems and components
 - TAB verification

Scope Clarifications:

1. **RSACx** will be provided any and all pertinent data needed to perform and complete the commissioning process such as: controls sequences, drawings, specifications, submittals and operation & maintenance manuals
2. **RSACx** shall not be responsible for excessive delays in the commissioning of the included systems due to construction issues or lack of cooperation from the contractors to complete or repair deficiencies noted
3. **RSACx** will need the cooperation of all contractors to perform systems functional testing. The controls contractor will be needed the majority of testing to manipulate the system for balancing and commissioning
4. Upon commissioning completion, **RSACx** shall turn over soft copies of the final commissioning report

Exclusions:

RSACx is an Independent 3rd party commissioning company and shall not be responsible for the following:

- Repairs, programming and/or installation of controls hardware or software
- MEP coordination
- Construction means, methods, site safety program, or any contractor project management functions
- IAQ management
- Electrical service and distribution commissioning
- Building envelope commissioning
- Blower Door Testing
- HEPA filter testing and certification

- Process piping
- Med gas piping
- Fume hood certification
- Performance and bid bond
- LEED requirements
- Test and balance contractor tasks
- Liquidated damages
- Offsite commissioning

Schedule for Document Review

Phase:	Events
Planning / Implementation	• Review OPR and BOD • Initial project schedule review
Construction	• 95% Design Drawing review See pricing (a1) • Contractor submittal review See pricing (a1) • Start-up schedule review • Commissioning schedule review • Operation and maintenance manual review • Training requirements review • Commissioning plan review & update
Acceptance	• Seasonal tests as required • Commissioning report & executive summary
Post Acceptance	• Update final commissioning report if applicable

Pricing:

Total Proposed Price for: Fundamental Cx Services.....	\$29,720
(a1) Total Proposed Add Price for: Design and Submittal Review.....	\$1,400

Please do not hesitate to call if you have any questions or need additional information.

Respectfully,

Michael H. Schowengerdt
Michael H. Schowengerdt, CxA

Terms and Conditions

1. The addressee as listed in this proposal shall be referenced as the "CUSTOMER"
2. Terms of payment: RSACx shall be paid in full upon receipt of **each** invoice. In the event that full payment is not received by RSACx within 60 days of invoice, then RSACx has the right to suspend services immediately and pursue payment.
3. The CUSTOMER shall pay RSACx any applicable taxes or government charges, which are required in connection with the service or material, furnished in addition to the final contract price agreed upon.
4. Additional repairs and/or materials: due to the complexity of HVAC systems and equipment, as work progresses there may be the need for additional repairs or materials, which could not have been anticipated at the time this agreement was accepted. Therefore, the price, subject to provisions herein, may be adjusted. However RSACx shall notify CUSTOMER of the price and description of any additional work / material and obtain Customer's written consent prior to undertaking such additional work / material.
5. Partial invoice(s) may be submitted for any portion of delivered material and/or completed work. All labor hours will be billed on a monthly basis.
6. Delays beyond the reasonable control of either party shall not be the liability of either party to this agreement.
7. Warranty: RSACx guarantees that all labor shall be performed in a workman like manner. No claim for defective workmanship may be brought upon any cause of action, however, unless CUSTOMER has provided RSACx with written notice of such defect within forty-five (45) days after completion and delivery of Final Cx report. This warranty is in lieu of all other warranties, expressed or statutory including the implied warranties of merchantability. Under this agreement, RSACx's obligation to repair, replace or issue credit for any defective part(s) or component(s) shall be the CUSTOMER'S exclusive remedy. The customer shall have the same guarantee as RSACx on Part(s) or component(s) furnished by others.
8. RSACx agrees to maintain adequate insurance while performing services on the customer's property.
9. RSACx shall not, under any circumstances, be liable for any accident, injury, breakage, loss or damage to the equipment or machinery, appliances, or property connected therewith or the resultant consequences, unless such loss or damage is caused by negligent acts of omission or commission by RSACx's agents, employees, or subcontractors.
10. RSACx shall not be liable for damages due to chemical/electro-chemical attack, in a currently existing defective condition(s) including any future progression of such defective condition(s), or any cause beyond RSACx's reasonable control.
11. Neither party to this agreement shall hold the other responsible for any indirect or consequential damages of a commercial nature such as, but not limited to, loss of revenue or loss of any equipment or facilities: or for commercial damages based on strict liability.
12. In the event of a judicial determination that any provision within this agreement is unenforceable or fails in its essential purpose, such determinations shall have no effect on the enforceability of the balance of the provisions herein.
13. RSACx shall not be required to perform tests, install any equipment or make modifications to systems or equipment that may be recommended or directed by insurance companies, government, state municipal, or other authority.
14. RSACx shall provide the services and/or parts in accordance with the "Terms and Conditions", "Scope of Work" which constitutes an entire agreement and shall become valid after acceptance by customer and approved by RSACx.

Proposal Acceptance

Project: Olympic Valley Boiler Replacement and VAV Upgrade

Please select accepted services below:

- ☐ Fundamental Cx Services
- ☐ Design and Submittal Review

Acceptance of proposal to perform the above referenced work:

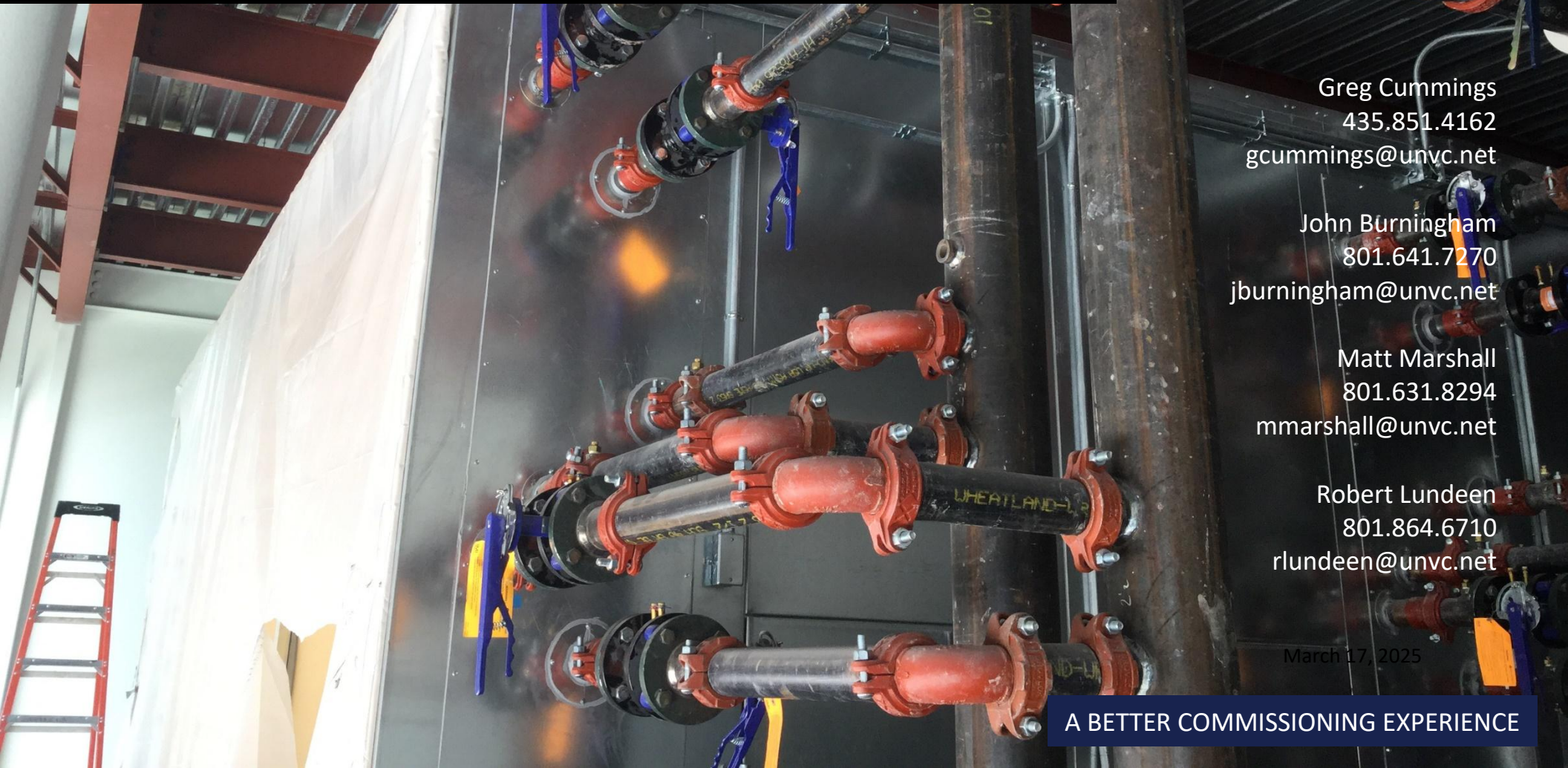
Signature_____

P.O. No._____

Project start date_____



Olympic Valley Boiler Plant and Controls System Commissioning Services Tiered Proposal – 03.17.2025



Greg Cummings
435.851.4162
gcummings@unvc.net

John Burningham
801.641.7270
jburningham@unvc.net

Matt Marshall
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Robert Lundeen
801.864.6710
rlundeen@unvc.net

March 17, 2025

A BETTER COMMISSIONING EXPERIENCE

Roger,

Thanks for contacting Levi and inviting us to propose commissioning services for replacing the Olympic Valley Boiler Plant and Controls System. Here are a few things to note: Levi Mitchell will be the Project Manager and CxA. He will be supported by Scott Payne, a controls expert of 35+ years, Derek Shupe, a TAB Tech of 35 years, and Garrett Dodge, who has been running our testing teams for the last 8 years. Matt Marshall will support all efforts to ensure timeliness and proper engineering coordination.

We have provided the Olympic Valley project with a tiered approach, with one level of service aligning with the minimal requirements and the other based on our suggested best practices; we provide this service for 90% of our institutional clients that have long-term cost in mind. It is common for private sector projects to call for a functional testing verification of 100% of major pieces of equipment, yet only 25% of terminal units. Additionally, it is the norm for prefunctional testing to be completed by the contractor and only the paperwork reviewed by the CxA. From experience, buildings are most successful with a 100% verification of points in person by the CxA. This allows our team to have a more significant and consistent presence on-site. This helps us become a resource to the contracting team as systems are being installed, and is more effective than having us come in at the end of the project to point out issues when there is little to no time left in the construction schedule and fixing things is more expensive.

After reviewing the drawings and specifications with our retro-commissioning specialist, Derek Shupe, he offered the following insights. We encourage you to integrate these insights into your design reviews and discussions.

Pre-Bid Observations- UNVC Value insights, Derek Shupe--

1. During the demo of the existing re-heat coils, a sampling of the heating water should be analyzed as to its condition prior to connecting the new coils. If the water samples indicate that the water condition is poor, steps should be taken to improve the water quality prior to connecting the new coils to the existing system.
2. VAV Boxes that serve multiple rooms or areas with only 1 thermostat may need to be verified that each diffuser is balanced to the proper air flow, otherwise unsatisfactory room temperatures may exist when the new VAV box is installed.
3. The mechanical contractor will need to pay close attention when filling the system after the new coils are installed to ensure that the make-up system keeps up and the system pressure is maintained.
4. There is a question about the Glycol Feeder. Does it only feed the snowmelt system or other parts of the hydronics as well?

PROJECT UNDERSTANDING

- Project – 26,000 sq. ft. approx.
- 4 month construction duration (duct to substantial completion)
- Owner Representative: Oly Valley Public Service Dist. Dave Hunt
- Contractor: TBD
- Mechanical Engineer: Ainsworth Associate
- Electrical Engineer: PK Electrical
- Controls: QCS INC.

The following systems shall be commissioned:

- Mechanical Systems
- VAV Boxes
- Heat Exchangers
- Piping – Including Expansion tanks and Air Separators
- Pumps
- Boilers
- Glycol Feed Unit
- Unit Heaters
- BMS Graphics and Points

COMMISSIONING TEAM

Project Manager/CxA	Levi Mitchell	Main point of contact in meetings, coordination, the driver of all Cx efforts
Project Engineer	Matt Marshall, PE	Engineering oversight and support to team members
Controls	Scott Payne	Controls reviews, meetings, testing
Balancing RCx	Derek Shupe	Specialist of TAB rebalancing
Testing	Garret Dodge	Coordinate and perform all testing
Project Principal	John Burningham	Oversight and support to all team members

We will work consistently from the beginning of the project, ensuring the building works, is comfortable, and can be maintained efficiently after everyone else has moved on. We look forward to working with you to show you the benefits of a well-commissioned building. If you have any questions or need clarification, please call me at 801.641.7270.

Regards, John Burningham and Levi Mitchell

SYSTEMS COMMISSIONING ACTIVITIES

SYSTEMS COMMISSIONING TIERED APPROACH

Buildings differ in size, purpose, importance, budget, and performance level. We tailor the commissioning approach to align with the needs of the project. We have provided two options here for your review to provide the owner with the best commissioning possible while maintaining the budget. While the core services of the RFP are met, we believe our additional recommended efforts assist the project in meeting the requirements of the various systems, improve energy and longevity, improves operator/facilities experience, and provides the owner with greater satisfaction. Note the CxA document provided in the RFP provides a generous amount of latitude and is not definitive in what is required.

Activity	Systems Commissioning Activity Description	Recommended Best Practices	Basic CX	Notes
DESIGN PHASE ACTIVITIES				
Cx Specifications	UNVC to provide a clear concise description of the Cx process, milestones, including roles/responsibilities of project team members, for review by the project team and incorporation into the contract documents.	X	X	
CD Drawing Reviews (50 - 85% Set)	UNVC to provide a review of CD drawing sets related to the OPR, owner priorities, performance, functionality, access, etc. The following systems will be reviewed. - Mechanical Systems - Temperature Controls - Project Specifications – Div. 23 (mechanical/controls upgrades)	X	X	
CD Cx Design Review Meeting	UNVC to review with project team the CD drawing review comments from UNVC and owner operators. UNVC to review with project team the DD drawing review comments. We anticipate multiple meetings through DD and CDs.	X		
Sequence of Operations/Controls Integration Meetings	UNVC to facilitate a review of proposed controls strategies as they relate to the OPR and the owner's operational practices. Ensure participation of the owner's building operators. The BAS points and trends will be reviewed to ensure they provide building operators with valuable data and graphics. Discuss the needs for an energy usage graphics page as appropriate.	X		
PRECONSTRUCTION & CONSTRUCTION PHASE ACTIVITIES				
Substitution Requests	UNVC to review proposed substitution requests as it relates to the functional performance of the MEP systems as required by the OPR. Building operators to review requests (optional). Substitution review will be coordinated with facilities management for operational impacts.	As Needed		

Activity	Systems Commissioning Activity Description	Recommended Best Practices	Basic CX	Notes
Submittal & Shop Drawing Review	UNVC to review 100% Cx related shop drawings and submittals. At a minimum, reviews will address constructability, sequencing, performance, function, durability, and related systems interface. Deviations from the OPR must be noted. Provide review comments to MEP and DAS related submittal and shop drawings either concurrently or sequential to the design team's review. UNVC to track all comments for resolution.	X	X	
Review ASIs and Proposed Change Orders	UNVC to review and assist in contract document modifications, ASI and Proposed Change Orders, related to the necessary changes to the building MEP and DAS systems. Building operators to review requests (optional). Ensure the priorities of the owner as established in the OPR are maintained and not unintentionally compromised.	As Needed		This review prevents coordination issues, keep the UNVC and operators, fully aware of the approved systems.
Develop Preliminary Cx/Construction Schedule	UNVC to coordinate with the general contractor in identifying Cx milestones within the overall project schedule. UNVC will ensure milestones are placed appropriately and tracked on the project schedule. It is anticipated that the schedule will be revisited and adjusted on an ongoing basis as discussed in Pull Planning MEP meetings (below).	X	X	
Cx Kick Off Meeting	UNVC to facilitate an in-person meeting for the project team with a review of the Cx process including roles, responsibilities, deliverables, schedule, OPR, and milestones.	X	X	
Sequence of Operations/Controls Integration Coordination Meeting	UNVC to facilitate a (second) review of proposed controls strategies. Ensure participation of the MEP engineering team, building operators, subcontractors, and related vendors. Meeting to occur after submittals have been approved.	X		
Test and Balance Coordination Meeting	Review the Test and Balance requirements with the project team to ensure the requirements are met as needed for commissioning and substantial completion. TAB scheduling will be reviewed as it relates to commissioning efforts.	X		This meeting will be held online
Commissioning Meetings and Site Inspections	UNVC to facilitate with the project team periodic coordination meetings to review the commissioning effort. Issues to be reviewed typically include sequencing, constructability, testing, schedule, field issues, and resolutions. It is suggested that the building operators attend whenever possible. Site inspection of current MEP efforts also included. Frequency as follows: • Early Construction - Cx Kick Off meeting only • Construction/MEP Install - Onsite once a month until duct installation • MEP Pull Planning/Huddle – Attend per contracting schedule (anticipating monthly) • Testing/Substantial Completion - Onsite weekly and daily as needed for 100% checkout.	X 12 Meetings & 12 Site Inspections		Based upon a 4-month Duct to Substantial Completion Duration
Commissioning Meetings and Site Inspections	UNVC to facilitate with the project team periodic coordination meetings to review the commissioning effort. Issues to be reviewed typically include sequencing, constructability, testing, schedule, field issues, and resolutions. It is suggested that the building operators attend whenever possible. Site inspection of current MEP efforts also included. Frequency as follows: • Early Construction - Cx Kick Off (Onsite or Virtual) • Construction/MEP Install – Onsite for PFT review of Contractors early installations • Testing/Substantial Completion - Onsite weekly as needed for 25% checkout.		X 8 Meetings & 8 Site Inspections	Based upon a 4-month Duct to Substantial Completion Duration

Activity	Systems Commissioning Activity Description	Recommended Best Practices	Basic CX	Notes
Site Observation Report Response	General Contractor to document the efforts to remediate issues presented in the Cx site observation report. UNVC to document in Action Log.	X	X	
Cx Process Tracking	UNVC to ensure GC updates the owner at each Owner/Architect/Contractor meeting. OAC meeting minutes to track the following: • Number of open Cx issues • Number of resolved issues • Date of last site observation/site test • Date of next site observation/site test • Major issues	X	X	This is to ensure the commissioning efforts stay on the radar of the OAC group throughout construction.
Pre-Functional Testing Activities				
First Install Reviews	UNVC to review first one to two installations of equipment to ensure proper installation per the construction documents, industry standards and manufacture's recommendations. This prevents errors from being repeated prior to PFT. The following at a minimum are required: • VAVs • Piping – Pipe trains, hangers, and insulation • Controls, sensors, and wiring	X		First install review ensures subsequent installs are correct.
Pre-Functional Acceptance Testing (PFT) – UNVC Performed	UNVC will create and fill out the PFT forms for ALL pieces of equipment. UNVC to then visually review each piece of equipment at 100% to ensure proper installation of all the systems. • Mechanical equipment - 100% • Hydronic piping flush and chemical treatment (UNVC reviewed on-site) • Boiler replacement, safeties, startup, and controls • Controls – 100% point-to-point and 100% sequence checkout	X		
Pre-Functional Acceptance Testing (PFT) – Contractor Performed	UNVC will create PFT forms for ALL pieces of equipment. THE CONTRACTOR to then visually review each piece of equipment to ensure proper installation of all the systems. UNVC to review the completed forms, not the equipment onsite. Contractor fills out and we verify 20%.		X	
Static Testing – Contractor Performed, UNVC Witnessed	UNVC must review and witness that the static testing is completed per NETA, SMACNA, IPC or NEC specifications. UNVC must witness testing at the following rates: • Duct Leakage - 1st test • Pipe Pressure - 1st test • Pipe Flushing - Attend beginning, strainer blowdown, and end of flush	X		
Static Testing – Contractor Performed, UNVC Reviews Forms	UNVC must review the static testing forms completed per NETA, SMACNA, IPC or NEC specifications. Contractor to complete and provide for UNVC review of forms only, not equipment.		X	

Activity	Systems Commissioning Activity Description	Recommended Best Practices	Basic CX	Notes
Start Up Testing & Assistance – UNVC Witnessed	UNVC to be onsite for the startup of all major pieces of equipment, as listed below, to ensure proper procedures per manufacturers' recommendations. UNVC to ensure that startup forms are completed by manufactures' representative using manufactures' recommended forms. - Air Handler (verify new controls and VFD settings on existing equipment) - Boilers - Pumps	X		UNVC is on site to ensure proper start up by manufacturer and contractor. We will ensure startup techs understand what is required so it is done right the first time
Start Up Testing – UNVC Reviews Forms	Contractor to perform start up testing per manufactures' recommendations. UNVC reviews completed forms. UNVC to ensure that startup forms are completed by manufactures' representative using manufactures' recommended forms. - Boilers - Pumps Manufactures and contractor to ensure proper start up.		X	
Contractor Readiness Forms	Contractor to complete checklist that each piece of equipment is fully ready for FPT.	X	X	Process ensures contracting teams are fully ready for testing.
Functional Performance Testing Activities				
Test and Balance	UNVC to review the T&B report and verify 15% of what is being reported. UNVC to ensure proper flows and that field settings are carried over to graphics.	X	X	
Functional Performance Testing (FPT) – 100% Testing by UNVC	UNVC will create Functional Performance Testing (FPT) forms. UNVC will perform all the testing (not the contractor). All forms will be completed by UNVC (not the contractor). A 100% confirmation of all commissioned systems will be required as noted below. - Mechanical equipment - 100% - Hydronic piping flush and chemical treatment - Boiler replacement, safeties, startup, and controls - Controls Point to Point - 100% - Controls Sequence of Operations - 100% - Test & Balance – Review entire report and verify 15% of field measurements 4-Week Trend Study	X		Operations and maintenance manuals and startup reports are delivered to UNVC prior to FPT.
Functional Performance Testing (FPT) – 100% Testing by Contractor, Sample Witnessed by UNVC	UNVC will create Functional Performance Testing (FPT) forms. UNVC will NOT perform the testing. UNVC to witness testing performed at the following rates. A 25%/100% confirmation of terminal/major systems will be required as noted below. - Major mechanical equipment - 100% - Terminal mechanical equipment – 25% Lighting – 20% Panelboards – 20% - Plumbing fixtures - 20% Mixing valves – 20% Electrical outlets – 2 per circuit - Controls Point to Point - 25% - Controls Sequence of Operations - 25% - Test & Balance - 15%		X	

Activity	Systems Commissioning Activity Description	Recommended Best Practices	Basic CX	Notes
Point to Point Testing – 100% Testing by UNVC	UNVC to provide point to point testing of the following systems at 100%. Record offsets needed for calibration. Proper Building Management Systems (BMS) integration to be verified. Analog outputs, analog inputs, digital outputs, and digital inputs will be tested.	X		
Point-to-Point Testing – 100% Testing by Contractor, 25% Reviewed by UNVC	UNVC to provide point-to-point testing of the following systems at 25%. Record offsets needed for calibration. Proper Building Management Systems (BMS) integration to be verified. Analog outputs, analog inputs, digital outputs, and digital inputs will be tested.		X	
Sequence of Operations (SOO) Testing – 100% Testing by UNVC	UNVC to review and test 100% of SOOs for all mechanical, plumbing, and electrical equipment. All main systems and pieces of equipment plus at least two terminal pieces of each system must be tested. The controls contractor must be present. Verify and provide documentation (screen shots) that SOOs meet the intent of the OPR.	X		
Sequence of Operations (SOO) Testing – 100% Testing by Contractor, 25% Reviewed by UNVC	UNVC to review and test 25% of SOOs for all mechanical, plumbing, and electrical equipment. All main systems and pieces of equipment plus at least two terminal pieces of each system must be tested. The controls contractor must be present. Verify and provide documentation (screen shots) that SOOs meet the intent of the OPR.		X	
Proportional, Integral, and Derivative (PID) Loops	UNVC to test each PID loop for hysteresis and tuning. To increase effectiveness, Auto-Tuning is prohibited.	X		Untuned loops are often mistaken as design problems.
Retesting of Equipment and Systems	UNVC to coordinate with contracting team for retesting efforts. In the event of a failure, all parties to support the effort to investigate and provide a remediation path to be taken by the contracting team. *Retesting in excess of this or by failure to follow the remediation path to be at the expense of the General Contactor via the Owner.	*X	*X	
Issues Resolution	UNVC to provide timely assistance the project team members to aid in the resolution of deficiency, omissions, and non-conformance issues. UNVC will request relevant contractors be present for site inspections.	X	X	
Flushing and Cleaning	UNVC to verify onsite proper flushing and clean procedures are implemented and followed per manufactures recommendations. 10% of blow down valves will be reviewed to ensure the system has not only been flushed and cleaned, but the strainers are clean as well.	X		
Substantial Completion	UNVC to provide the owner a list of outstanding commissioning related issues for incorporation into the overall design team punch list. We recommend that the CxA be a representative of the owner for MEP completion to ensure systems are fully ready and only minor issues spill into occupancy.	X	X	Owner to hold retainage from the general contracting team as necessary.

CLOSEOUT ACTIVITIES				
Operations and Maintenance Manual Review	UNVC to review the O&M manuals to ensure all systems and equipment have the proper manuals, submittals, and shop drawings, per the OPR. • Construction documents (drawings & specifications) • Approved submittals of commissioned systems • As-Built drawings • As-Built sequence of operations • Design setpoints for all commissioned systems • Actual setpoints for all commissioned systems • Sensor recalibration maintenance schedule	X		
Training	UNVC will review training agendas submitted and ensure that the training is sufficient, relevant, comprehensive, inclusive of connected systems per the OPR. The training must include the following: • Emergency instruction and procedures • Operational instruction and procedures • Review of the related systems manuals • Purpose of equipment • Overview of related systems • Explanation of how equipment is controlled • Design requirements • Troubleshooting procedures • Indicators that the equipment is functioning correctly • Indicators that the equipment is not functioning correctly • Maintenance and inspections procedures • Repair procedures • Overview of related maintenance record logs	X		
Training Evaluation	UNVC to administer a training evaluation based upon ASHRAE 0-2013 Appendix P. Results reported to the owner. Retraining costs may be borne by the contractor including compensation for professional wages lost as a result.	X		
Six Month Post Occupancy Review & Seasonal Testing	UNVC to facilitate a review of the commissioned systems with the design team, vendors, contracting team, building operators to review new issues, warranty issues, unresolved issues, etc. prior to the expiration of the warranty period.	X		

Final Cx Report	Final report to include the following. All drawing reviews, final OPR, final Cx plan, site reports, startup reports, testing reports, TAB report, and controls point-to-point report. • Executive summary • Unresolved issues • OPR or owner project requirements • Cx design reviews • Cx submittal reviews • Static test forms • Start Up reports • Cx meeting minutes • PFT results • FPT results • Sequence of Operations and Point-to-Point reports • Trending reports • Issues log • Owner training documents (agenda, forms, evaluation forms) • Final Cx plan	X	X	
Final 11 Month Warranty Review	UNVC to attend if outstanding commissioning items remain.	X		

FEE SUMMARY				
Activity		UNVC Best Practices	Basic Cx	Notes
Total Services Fee: 26,000 Square Feet (approximately)		\$43,330	\$32,000	

- UNVC to provide all testing equipment as it relates to the commission scope. For any test that UNVC is to witness, the expectation (and noted in the specs) is that the contractor will provide their own testing equipment.
- UNVC to provide 3 days advanced notice, 7 when possible, for all site visits.
- Retesting of failed equipment or systems will be billed to the contractor via the Owner. Retesting will be provided by UNVC in an expedient manner such that deficiencies do not collect over time but are eliminated as they are identified. Retesting efforts to be billed at \$175 per hour with a 4-hour minimum.



John Burningham
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jburningham@unvc.net