



300 Sierra Manor Drive, Suite 1  
Reno, NV 89511

December 17, 2024

Mr. Charles A. Moore  
**TRUCKEE MEADOWS FIRE AND RESCUE**  
3663 Barron Way  
Reno, NV 89511

**RE: Pre-Construction, Construction Management, and Administration Proposal  
TMFR Apple Fire Station Project**

Dear Mr. Moore:

Construction Materials Engineers, Inc. (CME) is pleased to submit the following proposal to provide professional services for Pre-Construction and Construction Management which includes Construction Administration Inspection Services for the Truckee Meadows Fire and Rescue Apple Fire Station Project.

## 1.0 PROJECT DESCRIPTION

We understand that the project includes the construction of a new fire station located off of Reno Technology Parkway near the Apple Data Center. At this time the project schedule is assumed to have an estimated Notice to Proceed (NTP) date of December 11, 2024 with a 62 week construction duration. Construction is expected to be completed by February 19, 2026.

## 2.0 SCOPE OF WORK

An itemized list of the specific activities included within each task is attached as part of our itemized estimated cost. At a minimum, the following construction administration services will be provided as detailed in the following six subtasks:

### 2.1 PRE-CONSTRUCTION SERVICES

- Conduct constructability review of the contract drawings.
- Conduct review of the construction contract, specifications, addendums, supplemental and geotechnical documents.
- Conduct review of bid results.
- Conduct review of initial project schedule
- Review submittals and RFIs and provide any feedback.
- Develop a QA/QC program for the project.

### 2.2 PROJECT MANAGEMENT

Provide construction project management on an as needed basis for 1.5 hours per week for 62 weeks.

- Provide oversight of construction administration services
- Provide monthly invoices with complete task breakdown
- Provide monthly budget summary of consultant services upon request

## 2.3 CONSTRUCTION MANAGEMENT & ADMINISTRATION

Provide contract administration services on an as needed basis (estimated part time with details shown on attached cost estimate). The administrator will provide the following:

- Review and provide recommendations on test results
- Review and provide recommendations on contractor's construction schedule and work progress
- Review construction for acceptance and/or mitigation
- Supervise the inspection and material testing activities
- Assist in change order review and approval.
- Pay Applications Review and Recommendation. Provide verification of contractor's monthly pay request. Provide recommendations to TMFR for payment
- Monthly field review of Contractor's Record Drawings.
- Assist in problem resolution with the TMFR and contractor personnel

## 2.4 MEETINGS

- Attend Design Team Review Meeting. Provide recommendations for pre-construction meeting agenda.
- Attend Pre-Construction Meeting.
- Attend weekly OAC Meetings and provide notes from the meetings.

## 2.5 CONSTRUCTION OBSERVATION

Provide one part time inspector during all construction activities for an average of 12-hours per week for the first 40 weeks and 15-hours for the last 22 weeks. Our special inspector will be the on-site inspector for the first 40 weeks, which allowed us to reduce our overall inspection hours during the first 40 weeks of the project. This inspector will provide the following:

- Monitor the work performed by the Contractor and verify that the work is in accordance with the plans and specifications
- Observation of Contractors compliance with the Contract Documents
- Daily Field Reports
- Testing Forms Documentation
- Will also provide CME's Special Inspection when required
- Photo documentation
- Review approved submittals for verify compliance in the field
- Verify compliance with RFI responses
- Observation of Electrical Testing
- Observation of Conduits, wire counts, and required testing.

## 2.6 PROJECT COMMISSIONING

Commissioning of the building mechanical, electrical, and plumbing systems to be performed by UNVC. UNVC will be available early in the construction process to assist with submittal review, drawing review, and MEP coordination/integration. UNVC will conduct pre-functional testing and functional testing activities and will assist in project closeout activities as they relate to MEP building equipment. CME will perform the following tasks in support of UNVC:

- Provide oversight of building commissioning process
- Coordinate with UNVC for building commissioning activities
- Attend commissioning meetings
- Attend commissioning related site walks as necessary

## 2.7 PROJECT CLOSEOUT

- Coordinate final punch list walk and provide final punch list document
- Permit Closeout Coordination (C of O, etc.)
- Final Conforming Change Order
- Letter of Final Completion Retention Request
- Help to Verify that all O&Ms are provided
- Final review to help with acceptance of Record Drawings.

## 2.8 EXCLUSIONS

- Submittal and RFI responses provided by Owner/Design Firm.
- Backup information for change documents provided by Owner/Design Firm.

## 3.0 ESTIMATED FEES

Based on our understanding of the project and the preliminary provided construction duration of 14 months, we will provide our Construction Administration, Inspection, and Materials Testing services, as outlined above, on a time and materials basis not to exceed the estimated total task fees of \$238,102.50. A ten percent contingency is included for any anticipated schedule and scope of work change. Attached is an itemized estimated cost breakdown.

Our services are dependent on your project duration and the provided scope of work. Any changes to the mentioned scope and provided project schedule may result in a change in cost. All services outside the mentioned scope including retests will be provided on a time and materials basis in accordance with our current standard fee schedule.

## 3.1 SUMMARY OF FEE

Table 1 below contains a rolled up summary of the estimated fees for all tasks.

Table 1: Summary of Estimated Fees	
Task	Estimated Fees Per Task
Task 1 – Pre-Construction Services	\$11,900.00
Task 2 – Project Management	\$6,200.00
Task 3 – Construction Management & Administration	\$32,810.00
Task 4 – Meetings	\$17,865.00
Task 5 – Construction Observation	\$117,450.00



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Task 6 – Project Commissioning	45,477.50
Task 7 – Project Closeout	6,400.00
<b>Total Estimated Fees:</b>	<b>238,102.50</b>

We thank you for the opportunity to submit this proposal and look forward to its favorable consideration. If you have any questions, please contact us.

Sincerely,



Kyle Payne  
CM - Project Manager  
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Jon A. Del Santo  
Principal  
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JAM:JAD:KRP:jam:  
V:\Projects\Minor Proposals\2024\Washoe County TMFR - No, 35 - Apple\CM Proposal Documents\2024.13.24 - CM Proposal Revision With Commissioning Scope



**TRUCKEE MEADOWS FIRE AND RESCUE - APPLE FIRE STATION  
PRE-CONSTRUCTION, CONSTRUCTION MANAGEMENT, INSPECTION,, AND MATERIALS TESTING  
62 WEEK SCHEDULE**

TRUCKEE MEADOWS FIRE & RESCUE

DATE : 12/17/2024

ACTIVITY	QUANTITY	UOM	QUANTITY	UOM	RATE	TOTAL	COMMENTS
<b>TASK 1 - PRE-CONSTRUCTION SERVICES</b>							
CM - PROJECT MANAGER	70	HRS			\$ 170.00	\$ 11,900.00	PRE-CONSTRUCTION MANAGEMENT
						\$	11,900.00
<b>TASK 2 - PROJECT MANAGEMENT</b>							
SENIOR PROJECT MANAGER	62	WKS	0.5	HRS	\$ 200.00	\$ 6,200.00	
						\$	6,200.00
<b>TASK 3 - CONSTRUCTION MANAGEMENT &amp; ADMINISTRATION</b>							
CM - PROJECT MANAGER	62	WKS	1.5	HRS	\$ 170.00	\$ 15,810.00	CONSTRUCTION COORDINATION
CM - CHANGE ORDER REVIEW	15	EA	2	HRS	\$ 170.00	\$ 5,100.00	15 CO'S @ 2 HRS/CO
CM - MONTHLY PROGRESS PAYMENT REVIEW	14	MONTHS	2	HRS	\$ 170.00	\$ 4,760.00	MONTHLY FOR 14 MONTHS
CM - MONTHLY RECORD DRAWING REVIEW	14	MONTHS	2	HRS	\$ 170.00	\$ 4,760.00	MONTHLY FOR 14 MONTHS
CM - MONTHLY SCHEDULE REVIEW & COORDINATION	14	MONTHS	1	HRS	\$ 170.00	\$ 2,380.00	MONTHLY FOR 14 MONTHS
						\$	32,810.00
<b>TASK 4 - MEETINGS</b>							
CM - PROJECT MANAGER	2	HRS			\$ 170.00	\$ 340.00	PRE-CONSTRUCTION MEETING
INSPECTOR - REG.	2	HRS			\$ 130.00	\$ 260.00	PRE-CONSTRUCTION MEETING
VEHICLE	4	HRS			\$ 15.00	\$ 60.00	PRE-CONSTRUCTION MEETING
CM - PROJECT MANAGER	62	EA	1.5	HRS	\$ 170.00	\$ 15,810.00	WEEKLY OAC MEETING
VEHICLE	62	EA	1.5	HRS	\$ 15.00	\$ 1,395.00	WEEKLY OAC MEETING
						\$	17,865.00
<b>TASK 5 - CONSTRUCTION OBSERVATION</b>							
INSPECTOR - REG.	40	WKS	12	HRS	\$ 130.00	\$ 62,400.00	ON SITE CONSTRUCTION OBSERVATION
VEHICLE	40	WKS	12	HRS	\$ 15.00	\$ 7,200.00	ON SITE CONSTRUCTION OBSERVATION
INSPECTOR - REG.	22	WKS	15	HRS	\$ 130.00	\$ 42,900.00	ON SITE CONSTRUCTION OBSERVATION
VEHICLE	22	WKS	15	HRS	\$ 15.00	\$ 4,950.00	ON SITE CONSTRUCTION OBSERVATION
						\$	117,450.00
<b>TASK 6 - PROJECT COMMISSIONING</b>							
UNVC COMMISSIONING SERVICES	1	LS	+	10%	\$ 31,000.00	\$ 34,100.00	COMMISSIONING SERVICES
CM - PROJECT MANAGER	6	WKS	6	HRS	\$ 170.00	\$ 6,120.00	COMMISSIONING OVERSIGHT
VEHICLE	6	WKS	6	HRS	\$ 15.00	\$ 540.00	COMMISSIONING OVERSIGHT
CM - PROJECT MANAGER	17	EA	1.5	HRS	\$ 170.00	\$ 4,335.00	COMMISSIONING MEETINGS
VEHICLE	17	EA	1.5	HRS	\$ 15.00	\$ 382.50	COMMISSIONING MEETINGS
						\$	45,477.50
<b>TASK 7 - PROJECT CLOSEOUT</b>							
CM - PROJECT MANAGER	30	HRS			\$ 170.00	\$ 5,100.00	CLOSEOUT SERVICES
INSPECTOR - REG.	10	HRS			\$ 130.00	\$ 1,300.00	CLOSEOUT SERVICES
						\$	6,400.00
<b>ESTIMATED TOTAL FEE:</b>						<b>\$ 238,102.50</b>	

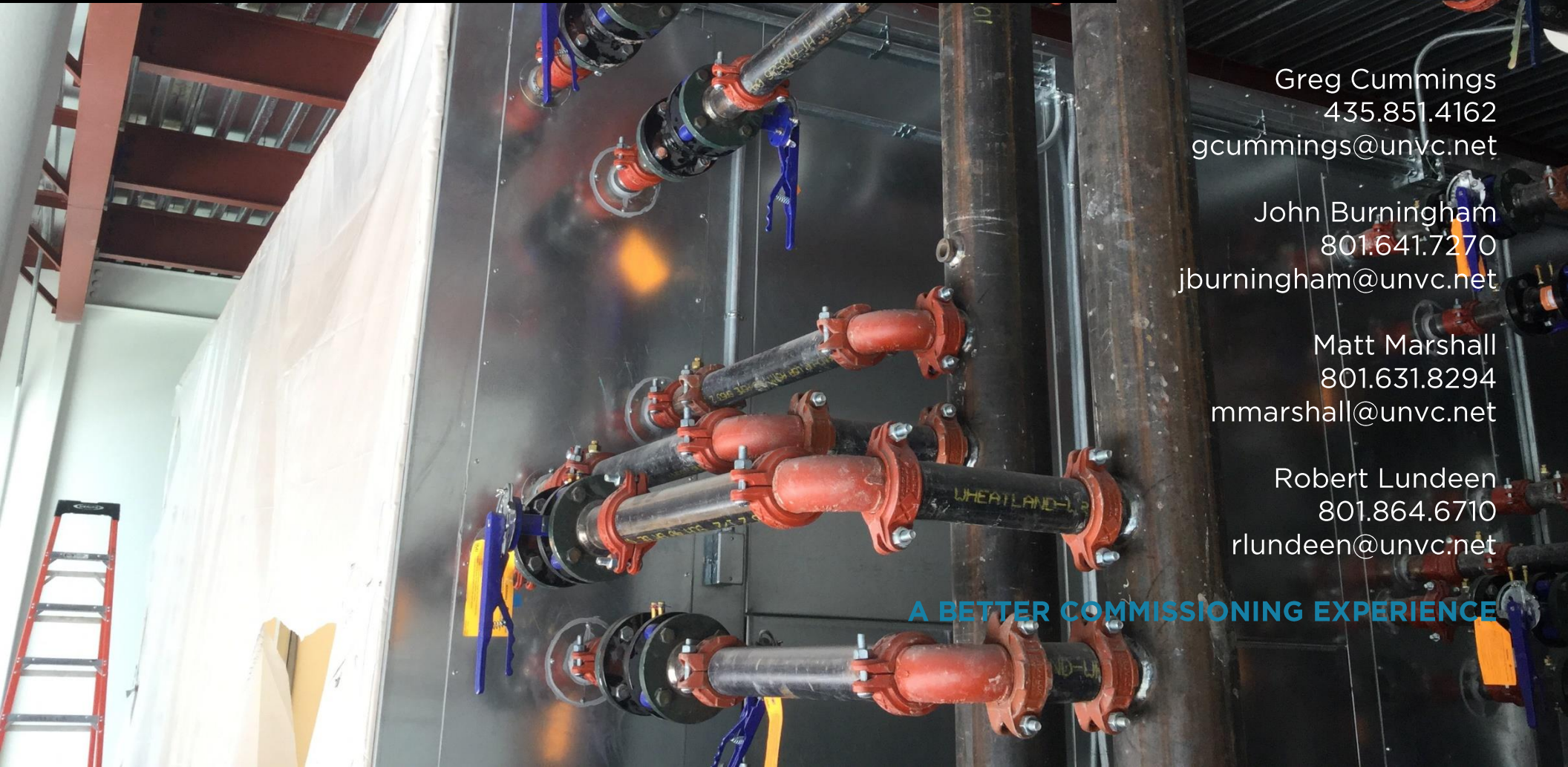
**NOTES:**

1. ASSUMED 62 WEEKS FOR CONSTRUCTION (14 MONTHS)
2. OUTSIDE SERVICES ARE MARKED UP 10%





## Truckee Meadows Fire Protection District Station 35 Commissioning Services Proposal -12.13.2024



Greg Cummings  
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jburningham@unvc.net

Matt Marshall  
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Robert Lundeen  
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rlundeen@unvc.net

**A BETTER COMMISSIONING EXPERIENCE**

December 13, 2024

Kyle,

Thanks for contacting John and inviting us to propose on Truckee Meadows Fire Protection District Station 35. We appreciate John Collins putting us in touch. Here are a few things to note: Michael Ruesch will be the Project Manager and CxA. Michael has recently commissioned two fire stations in Mesquite and Las Vegas. 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 Truckee Meadows Fire Protection District Station 35 project with a tiered approach, with one level of service aligning with the minimal requirements of the RFQ and the other based on our suggested best practices that align with the Building Commissioning Association's Best Practices. Note that these best practices leave significant room for interpretation, such as the percentage of verification required. 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 CxA), allowing our team to have a more significant, more consistent site presence to be a resource to the contracting team as systems are being installed vs. coming in at the end to point out issues when there is little to no time left in the construction schedule and fixing things is more expensive.

#### PROJECT UNDERSTANDING

- Project Fire Station 13,868 SF & Pump House 1375 SF
- Substantial Completion: the NTP is expected to be issued by Dec 15, 2024, and the project is expected to have a 62-week construction duration (from NTP).
- Owner Representative: Savini Group, Rod Savini (775) 813-0074
- Architect: H+K Architects
- Contractor: TBD
- Mechanical, Electrical Engineers: Ainsworth

The following systems shall be commissioned:

- Mechanical Systems
- Plumbing Systems
- Electrical Systems
- Spaces to be commissioned include offices, restrooms, dayroom, kitchen, pumphouse, appartatus room, and any other rooms with MEP equipment.

**COMMISSIONING TEAM**

<b>Project Manager/CxA</b>	<b>Michael Ruesch</b>	<b>Main point of contact in meetings, coordination, the driver of all Cx efforts</b>
Project Engineer	Matt Marshall, PE	Engineering oversight and support to team members
Controls	Scott Payne	Controls reviews, meetings, testing
Testing	Garret Dodge and Derek Shupe	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, with the end goal of 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 clarifications, please call me at 702.449.2417.

Regards, Michael Ruesch

**SYSTEMS COMMISSIONING ACTIVITIES****SYSTEMS COMMISSIONING TIERED APPROACH**

Buildings differ in size, purpose, importance, budget, and performance level. The commissioning approach align with them. 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 meet we believe our additional recommended efforts when added assist the project in meeting the requirements of the various systems, improve energy and longevity, adds needs of the operators, and provides greater owner satisfaction. Note the BCxA 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 BCxA Best Practices	Per RFP Minimum	Notes
<b>DESIGN PHASE ACTIVITIES</b>				
<b>Cx Process Specifications</b>	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		



Activity	Systems Commissioning Activity Description	Recommended BCxA Best Practices	Per RFP Minimum	Notes
<b>Cx Functional Testing Specifications</b>	UNVC to provide a clear and concise description of the Cx testing requirements, approximate timeframe for each test, and performance criteria for review by the project team and incorporation into the contract documents. Additional considerations may include testing roles/responsibilities, milestones, documentation, failures, retesting, testing location, and coordination with systems manuals, preventative maintenance, schedules, attic stock, warranties, and as builds.	X		
<b>CD Drawing Reviews (50 - 85% Set)</b>	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. <ul style="list-style-type: none"> <li>• HVAC</li> <li>• Plumbing</li> <li>• Electrical</li> <li>• DAS</li> <li>• Data Cabling</li> <li>• Emergency</li> <li>• Fire/Smoke</li> </ul>	X	X	
<b>CD Cx Design Review Meeting</b>	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	X	
<b>Sequence of Operations/Controls Integration Meetings</b>	UNVC to facilitate a review of proposed controls strategies as they relate to the OPR and 'he owner's operational practices. Ensure participation of 'he owner's building operators. The BAS requirements will be reviewed to ensure they provided building operators valuable data and graphics. Also to ensure a energy usage graphics page is included in scope. Will need to review these requirements with the U of U staff.	X		The first in a series of controls performance-based reviews and discussions.
<b>PRECONSTRUCTION &amp; CONSTRUCTION PHASE ACTIVITIES</b>				
<b>Substitution Requests</b>	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.	X		
<b>Submittal &amp; Shop Drawing Review</b>	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	
<b>Review ASIs and Proposed Change Orders</b>	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.	X		This review prevents coordination issues, keep the UNVC and operators, fully aware of the approved systems.

Activity	Systems Commissioning Activity Description	Recommended BCxA Best Practices	Per RFP Minimum	Notes
<b>Develop Preliminary Cx/Construction Schedule</b>	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	
<b>MEP Coordination/Planning Meetings - Ongoing</b>	UNVC to attend MEP planning meetings to keep informed of the most current schedule and anticipated changes. From these meetings we will identify the accurate schedule and timing of first installs and startups.	12 Meetings over course of project		
<b>Cx Kick Off Meeting</b>	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	
<b>BIM Coordination Review</b>	UNVC to review the project team’s Building Information Model (BIM) ensure the installation of the MEP systems reflect the contract documents, shop drawings, and submittals. Ensure maintenance access, unforeseen coordination issues, and proper clearances for replacement. UNVC to verify that contracting team and design team have performed proper clash detection assessment of various systems.	X		We will review our effort with the building operations group. Additional concerns will be noted.
<b>Sequence of Operations/Controls Integration Coordination Meetings</b>	UNVC to facilitate a (second) review of proposed controls strategies. Ensure participation of the MEP engineering team, building operators, subcontractors, and related vendors. Review to occur after submittals have been approved.	X		
<b>Test and Balance Coordination Meeting</b>	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		
<b>Commissioning Meetings and Site Inspections</b>	<p>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:</p> <ul style="list-style-type: none"> <li>• Early Construction - Cx Kick Off meeting only</li> <li>• Construction/MEP Install - Onsite every monthly until Duct</li> <li>• MEP Pull Planning/Huddle – Attend per contracting schedule (anticipating monthly)</li> <li>• Testing/Substantial Completion - Onsite weekly and daily as needed for 100% checkout.</li> </ul>	12 Meetings & 12 Site Inspections		
<b>Commissioning Meetings and Site Inspections</b>	<p>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:</p> <ul style="list-style-type: none"> <li>• Early Construction - Cx Kick Off (Onsite or Virtual)</li> <li>• Construction/MEP Install – Onsite for PFT review of Contractors early installations</li> <li>• Testing/Substantial Completion - Onsite weekly as needed for 25% checkout.</li> </ul>		X 10 Meetings & 7 Site Inspections	

Activity	Systems Commissioning Activity Description	Recommended BCxA Best Practices	Per RFP Minimum	Notes
<b>Site Observation Report Response</b>	General Contractor to document the efforts to remediate issues presented in the Cx site observation report. UNVC to document in issues log.	X	X	
<b>Cx Process Tracking</b>	UNVC to ensure GC updates the owner at each Owner/Architect/Contractor meeting. OAC meeting minutes to track the following: <ul style="list-style-type: none"> <li>• Number of open Cx issues</li> <li>• Number of resolved issues</li> <li>• Date of last site observation/site test</li> <li>• Date of next site observation/site test</li> <li>• Major issues</li> </ul>	X	X	This is and FYI effort to ensure Cx efforts stay on the radar of the OAC group throughout construction.
<b>Pre-Functional Testing Activities</b>				
<b>First Install Reviews</b>	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: <ul style="list-style-type: none"> <li>• Piping, including piping supports, underground, overhead</li> <li>• Duct, including sealing</li> <li>• Terminal equipment</li> <li>• Fan coil units</li> <li>• Piping insulation</li> <li>• Duct insulation</li> <li>• Overhead rack electrical distribution</li> <li>• Electrical voltage drops</li> <li>• Occupancy and daylighting sensor</li> </ul>	X		First install review ensures subsequent installs are correct.
<b>Pre-Functional Acceptance Testing (PFT) – UNVC Performed</b>	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. <ul style="list-style-type: none"> <li>• Mechanical equipment - 100%</li> <li>• Lighting - 100%</li> <li>• Panelboards - 100%</li> <li>• Emergency electrical backup - 100%</li> <li>• Plumbing fixtures - 100%</li> <li>• Mixing valves - 100%</li> <li>• Security access controls - 100%</li> <li>• Electrical outlets - (2 per circuit)</li> <li>• DAS – Provide PFT forms and review</li> <li>• Data - Review raceways and grounding</li> <li>• Fire Smoke Damper - Accessibility</li> </ul>	X		

Activity	Systems Commissioning Activity Description	Recommended BCxA Best Practices	Per RFP Minimum	Notes
<p><b>Pre-Functional Acceptance Testing (PFT) – Contractor Performed</b></p>	<p>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 10%.</p>		<p>X</p>	
<p><b>Static Testing – Contractor Performed UNVC Witnessed</b></p>	<p>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:</p> <ul style="list-style-type: none"> <li>• Duct Pressure - 1st test &amp; 75% all tests</li> <li>• Pipe Pressure - Gather test results</li> <li>• Pipe Flushing - 100% - Attend beginning and end of each test</li> <li>• Megger Test - 1st test &amp; 10% all tests</li> <li>• Torque Test - 1st test &amp; 10% all tests</li> <li>• Hi-POT Test - 1st test &amp; 10% all tests</li> <li>• Chlorination Test - Gather test results</li> <li>• Panel IR Test - 1st test &amp; 10% all tests</li> <li>• Transformer Oil - Gather test results</li> <li>• Ground Resistance - Gather test results</li> <li>• Piping Slope Verification - Gather test results</li> <li>• Breaker Testing - Gather test results</li> <li>• Generator Load Bank Test - Gather test results</li> <li>• Battery Back Up Load Bank - 100%</li> </ul>	<p>X</p>		<p>UNVC is witnessing a significant portion of the static testing and can be there to ensure it is done correctly.</p>
<p><b>Start Up Testing &amp; Assistance</b></p>	<p>UNVC to be onsite for the startup of all major pieces of equipment and major systems, listed below, to ensure proper procedures per manufactures recommendations. UNVC to ensure that startup forms are completed by manufactures representative using manufactures recommended forms.</p> <ul style="list-style-type: none"> <li>• AHU</li> <li>• Boilers</li> <li>• Chillers</li> <li>• Pumps with VFDs</li> <li>• ERVS</li> <li>• Packaged RTUs</li> <li>• Dx condenser units (over 5 tonnes)</li> <li>• VRF units</li> <li>• Heat pumps (over 5 tonnes)</li> <li>• Generators</li> <li>• UPS systems</li> </ul>	<p>X</p>		<p>UNVC is on site to ensure proper start up by manufacture and contractor. We will ensure startup techs understand what is required so it is done right the first time</p>

Activity	Systems Commissioning Activity Description	Recommended BCxA Best Practices	Per RFP Minimum	Notes
<b>Start Up Testing – “Select” Witnessing</b>	Contractor to perform start up testing per manufactures recommendations. UNVC provides select witnessing, and reviews completed forms. UNVC to ensure that startup forms are completed by manufactures representative using manufactures recommended forms. <ul style="list-style-type: none"> <li>• AHU</li> <li>• Boilers</li> <li>• Cooling Tower</li> <li>• Pumps with VFDs</li> <li>• Rooftop Units</li> <li>• Makeup Air Unit</li> <li>• Dx condenser units (over 5 tons)</li> <li>• Generator</li> </ul> Manufactures and contractor to ensure proper start up.		X	
<b>Contractor Readiness Forms</b>	UNVC to complete checklist that each piece of equipment is fully ready for FPT.	X	X	Process ensures contracting teams are fully ready for testing.
<b>Test and Balance</b>	UNVC to review the T&B report and verify 10% of what is being reported. UNVC to ensure proper flows. Move this to the Functional Performance Testing section.	X	X	
<b>Functional Performance Testing Activities</b>				
<b>Functional Performance Testing (FPT) – 100%</b>	UNVC will create Functional Acceptance Testing (FPT) forms. UNVC will perform all the testing (not the contractor), except for DAS. All forms will be completed by UNVC (not the contractor). A 100% confirmation of all commissioned systems will be required as noted below. <ul style="list-style-type: none"> <li>• Mechanical equipment - 100%</li> <li>• Lighting - 100%</li> <li>• Panelboards - 100%</li> <li>• Emergency electrical backup - 100%</li> <li>• Plumbing fixtures - 100%</li> <li>• Mixing valves - 100%</li> <li>• Security access controls - 100%</li> <li>• Electrical outlets - 2 per circuit</li> <li>• Controls Point to Point - 100%</li> <li>• Controls Sequence of Operations - 100%</li> <li>• Occupancy Sensors - 100%</li> <li>• Test &amp; Balance - 10%</li> <li>• DAS performance testing – Provide checklists and witness testing</li> </ul>	X		Operations and maintenance manuals and startup reports are delivered to UNVC prior to FPT.

Activity	Systems Commissioning Activity Description	Recommended BCxA Best Practices	Per RFP Minimum	Notes
<b>Functional Performance Testing – UNVC Performed Sampling 25% Option</b>	UNVC will create Functional Performance Testing (FPT) forms. <b>UNVC will perform all the testing (not the contractor)</b> . All forms will be completed by UNVC (not the contractor). A 100% confirmation of all major equipment and 25% of terminal equipment. Only reports of failed equipment and tests to be documented. (equipment that passes will not be documented).		X	
<b>Point to Point Testing – 100%</b>	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		
<b>Point to Point Testing – Sampling 25% Option</b>	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	
<b>Sequence of Operations (SOO) Testing – 100% Option</b>	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		
<b>Sequence of Operations (SOO) Testing – Sampling 25% Option</b>	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	
<b>NETA Testing</b>	UNVC to review the NETA Testing reports of related electrical systems including the following. <ul style="list-style-type: none"> <li>• Switchboards</li> <li>• Transformers</li> <li>• Breakers over 200 AMP</li> <li>• Medium Voltage Switchgear</li> <li>• Conductors</li> <li>• Ground Fault System</li> </ul>	X		
<b>Proportional, Integral, and Derivative (PID) Loops</b>	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.
<b>Retesting of Equipment and Systems</b>	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. <b>*Retesting in excess of this or by failure to follow remediation path to be performed at the expense of the General Contactor via the Owner.</b>	*X	*X	
<b>Issues Resolution</b>	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	



Activity	Systems Commissioning Activity Description	Recommended BCxA Best Practices	Per RFP Minimum	Notes
<b>Flushing and Cleaning</b>	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		
<b>Substantial Completion</b>	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.
<b>CLOSEOUT ACTIVITIES</b>				
<b>Operations and Maintenance Manual Review</b>	UNVC to review the O&M manuals to ensure all systems and equipment have the proper manuals, submittals, and shop drawings, per the OPR. <ul style="list-style-type: none"> <li>• Construction documents (drawings &amp; specifications)</li> <li>• Approved submittals of commissioned systems</li> <li>• As-Built drawings</li> <li>• As-Built sequence of operations</li> <li>• Design setpoints for all commissioned systems</li> <li>• Actual setpoints for all commissioned systems</li> <li>• Sensor recalibration maintenance schedule</li> <li>• Distributed Antenna Systems</li> </ul>	X	X	
<b>Training</b>	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: <ul style="list-style-type: none"> <li>• Emergency instruction and procedures</li> <li>• Operational instruction and procedures</li> <li>• Review of the related systems manuals</li> <li>• Purpose of equipment</li> <li>• Overview of related systems</li> <li>• Explanation of how equipment is controlled</li> <li>• Design requirements</li> <li>• Troubleshooting procedures</li> <li>• Indicators that the equipment is functioning correctly</li> <li>• Indicators that the equipment is not functioning correctly</li> <li>• Maintenance and inspections procedures</li> <li>• Repair procedures</li> <li>• Overview of related maintenance record logs</li> </ul>	X	X	
<b>Training Evaluation</b>	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		

Activity	Systems Commissioning Activity Description	Recommended BCxA Best Practices	Per RFP Minimum	Notes
<b>Preventative Maintenance Plan Review and Schedule</b>	UNVC to review PM plans as submitted by the contractor, address deficiencies, and develop a preventative maintenance schedule to complement the ongoing commissioning plan. UNVC to aid in the incorporation of equipment with the U of U CMMS as needed. When testing of loading, staging and capacities can't be done in initial season, testing will be deferred to the appropriate season.	X	X	
<b>Six Month Post Occupancy Review &amp; Seasonal Testing</b>	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	X	
<b>Final Cx Report</b>	<p>Final report to include the following. All drawing reviews, final OPR, final Cx plan, BECx specifications, all site reports, all testing reports.</p> <ul style="list-style-type: none"> <li>• Executive summary</li> <li>• Unresolved issues</li> <li>• PFT results</li> <li>• FPT results</li> <li>• Issues log</li> <li>• Cx meeting minutes</li> <li>• NETA Electrical Systems Testing Reports</li> <li>• Start Up reports</li> <li>• SOO &amp; Point to Point reports</li> <li>• Static test forms</li> <li>• Trending reports</li> <li>• Owner training documents (agenda, forms, evaluation forms)</li> <li>• OPR</li> <li>• Cx design reviews</li> <li>• Cx submittal reviews</li> <li>• Final Cx plan</li> <li>• Equipment tagging information (CMMS)</li> </ul>	X	X	
<b>Final 11 Month Warranty Review</b>	UNVC to attend if outstanding commissioning items remain.	X	X	

FEE SUMMARY			
Activity	Recommend ed "BCxA Best Practices"	Per RFP Minimum	Notes
<b>Total Services Fee: 15,243 SF</b>	<b>\$31,000</b>	<b>\$24,000</b>	

- UNVC to provide all testing equipment as it relates to the commission scope. 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 all testing equipment except for breaker testing, megger, hi-pot, continuity, mandrel.
- UNVC will conduct visual inspections of installed electrical systems per NETA Acceptance Testing Specifications.
- 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.



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